Board of Directors Agenda

June 26, 2025

Click link to access the meeting:

https://www.zoomgov.com/j/1602805839

Zoom Meeting ID

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Computer: Click the link above. You will be prompted to run the Zoom browser or Zoom application. Once signed on to the meeting, you will have the option to join using your computer audio system or phone.

Webinar Features:

Raise Hand	▶	Use the **raise hand** feature every time you wish to make a public comment.
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	▶	This symbol shows you are **muted**, click this icon to unmute your microphone.
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	▶	The chat feature should be used by panelists and attendees solely for "housekeeping" matters as comments made through this feature will not be retained as part of the meeting record. See the **Live Verbal Public Comment** for instructions on how to make a public comment.

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1. If you are joining the meeting audio by phone and viewing the meeting on a device, dial the number provided in the 'join audio' phone call tab of the initial pop-up, and enter the Meeting ID (found in the link).
2. If you are joining by phone only, dial: **+1-669-900-9128** or **+1-253-215-8782** and type the meeting ID found in the link, press #. You will have access to the meeting audio, **but will NOT be able to view the PowerPoint presentations.**

Live Verbal Public Comments: Use the 'Raise Hand' icon every time you wish to make a public comment on an item. Raise your hand once the agenda item you wish to comment on has been called. In person public comments will be taken first, virtual attendees will be taken in the order in which they raise their hand. Requests to speak will not be taken after the public comment period ends, unless under the Chair's discretion. General Public Comment, at the beginning of the Board of Directors meeting only, will be limited to five speakers. Additional speakers with general public comments will be heard at the end of the meeting. Two-minutes of time is allotted per speaker, unless otherwise directed by the Chair.

Public Comments Made Via Zoom

1. Click the link found at the top of this instruction page
2. Click the raise hand icon located in the bottom center of the platform
3. The Clerk will announce your name when it is your turn to speak
4. Unmute yourself to speak

Public Comments Made by Phone Only

1. Dial **+1-669-900-9128**
2. Type in the zoom meeting ID found in the link and press #
3. Dial *9 to raise your hand via phone
4. The Clerk will call out the last 4 digits of your phone number to announce you are next to speak
5. Dial *6 to unmute yourself

Written Public Comments (before the meeting): Written public comments will be recorded in the public record and will be provided to MTS Board Members in advance of the meeting. Comments must be emailed or mailed to the Clerk of the Board* by 4:00pm the day prior to the meeting.

Translation Services: Requests for translation services can be made by contacting the Clerk of the Board* at least four working days in advance of the meeting.

In-Person Participation: In-person public comments will be heard first. Following in-person public comments, virtual attendees will be heard in the order in which they raise their hand via the Zoom platform. Speaking time will be limited to two minutes per person, unless specified by the Chairperson. Requests to speak will not be taken after the public comment period ends, unless under the Chair's discretion.

Instructions for providing in-person public comments:

1. Fill out a speaker slip located at the entrance of the Board Room;
2. Submit speaker slip to MTS staff seated at the entrance of the Board Room;
3. When your name is announced, please approach the podium located on the right side of the dais to make your public comments.

Members of the public are permitted to make general public comment at the beginning of the agenda or specific comments referencing items on the agenda during the public comment period. General Public Comment, at the beginning of the Board of Directors meeting only, will be limited to five speakers. Additional speakers with general public comments will be heard at the end of the meeting.

Assistive Listening Devices (ALDs): ALDs are available from the Clerk of the Board* prior to the meeting and are to be returned at the end of the meeting.

Reasonable Accommodations: As required by the Americans with Disabilities Act (ADA), requests for agenda information in an alternative format or to request reasonable accommodations to facilitate meeting participation, please contact the Clerk of the Board* at least two working days prior to the meeting.

***Contact Information:** Contact the Clerk of the Board via email at ClerkoftheBoard@sdmts.com, phone at **(619) 398-9561** or by mail at **1255 Imperial Ave. Suite 1000, San Diego CA 92101.**

Agenda de la Junta de Directores

June 26, 2025

Haga clic en el enlace para acceder a la reunión:

https://www.zoomgov.com/j/1602805839

ID de la reunión en Zoom

Formas de Participar

Computadora: Haga clic en el enlace más arriba. Recibirá instrucciones para operar el navegador de Zoom o la aplicación de Zoom. Una vez que haya iniciado sesión en la reunión, tendrá la opción de participar usando el sistema de audio de su computadora o teléfono.

Funciones del Seminario En Línea:

Levantar la mano	▶	Use la herramienta de **levantar la mano** cada vez que desee hacer un comentario público.
CC	▶	Los participantes pueden habilitar **el subtitulado** haciendo clic en el ícono CC. También puede ver la transcripción completa y cambiar el tamaño de letra haciendo clic en “configuración de subtítulos”. Estas herramientas no están disponibles por teléfono.
	▶	Este símbolo indica que usted se encuentra en **silencio**, haga clic en este ícono para quitar el silenciador de su micrófono.
	▶	Este símbolo indica que su micrófono se encuentra **encendido**. Haga clic en este símbolo para silenciar su micrófono.
	▶	La herramienta de chat deben usarla los panelistas y asistentes únicamente para asuntos “pertinentes a la reunión”, ya que comentarios realizados a través de esta herramienta no se conservarán como parte del registro de la reunión. Consulte el **Comentario público verbal** en vivo para obtener instrucciones sobre cómo hacer un comentario público.

Teléfono Inteligente o Tableta: Descargue la aplicación de Zoom y participe en la reunión haciendo clic en el enlace o usando el ID del seminario web (que se encuentra en el enlace).

Descarga en el App Store

Obténla en Google Play

Teléfono:

1. Si está participando en la reunión mediante audio de su teléfono y viendo la reunión en un dispositivo, marque el número indicado en la pestaña de llamada telefónica “unirse por audio” en la ventana emergente inicial e ingrese el ID de la reunión (que se encuentra en el enlace).
2. Si está participando solo por teléfono, marque: **+1-669-900-9128** o **+1-253-215-8782** e ingrese el ID de la reunión que se encuentra en el enlace, pulse #. Tendrá acceso al audio de la reunión, **pero NO podrá ver las presentaciones en PowerPoint.**

Comentarios Públicos Verbales en Vivo: Use la herramienta “levantar la mano” cada vez que desee hacer un comentario público sobre alguno de los artículos. Levante la mano una vez que el artículo de la agenda sobre el que desea comentar haya sido convocado. Los comentarios públicos en persona se escucharán primero, se escuchará a los asistentes virtuales en el orden en el que levanten la mano. No se aceptarán solicitudes para hablar después de que termine el periodo para hacer comentarios públicos, a menos de que el presidente determine de otra forma a su discreción. Comentarios públicos generales, únicamente al inicio de la reunión de la Junta de Directores, se limitarán a cinco personas que deseen hablar. Las personas adicionales que deseen aportar comentarios públicos generales podrán hacerlo al final de la reunión. Se otorga dos minutos de tiempo por persona que desee hablar, a menos de que el presidente instruya de otra forma. (*Consulte la página 2 para obtener instrucciones sobre cómo hacer un comentario público.*)

Comentarios Públicos a Través de Zoom

1. Haga clic en el enlace que se encuentra en la parte superior de esta página de instrucciones
2. Haga clic en el ícono de levantar la mano en el centro inferior de la plataforma
3. El secretario anunciará su nombre cuando sea su turno de hablar
4. Desactive el silenciador para que pueda hablar

Comentarios Públicos Realizados Únicamente por Teléfono

1. Marque el **+1-669-900-9128**
2. Ingrese el ID de la reunión en Zoom que se encuentra en el enlace y pulse #
3. Marque *9 para levantar la mano por teléfono
4. El secretario indicará los últimos 4 dígitos de su número de teléfono para anunciar que usted será el siguiente en hablar
5. Marque *6 para desactivar el silenciador

Comentarios Públicos por Escrito (Antes de la Reunión): Los comentarios públicos por escrito se registrarán en el registro público y se entregarán a los miembros de la Junta de MTS antes de la reunión. Los comentarios deben enviarse por correo electrónico o postal al secretario de la Junta* antes de las 4:00 p.m. el día anterior a la reunión.

Servicios de Traducción: Pueden solicitarse servicios de traducción comunicándose con el secretario de la Junta* por lo menos cuatro días hábiles antes de la reunión.

Participación en Persona: Los comentarios públicos en persona se escucharán primero. Después de los comentarios públicos en persona, se escuchará a los asistentes virtuales en el orden en el que levanten la mano a través de la plataforma de Zoom. El tiempo para hablar se limitará a dos minutos por persona, a menos de que el presidente especifique de otra forma. No se recibirán solicitudes para hablar después de que termine el periodo para hacer comentarios públicos, a menos de que el presidente determine de otra forma a su discreción.

Instrucciones para brindar comentarios públicos en persona:

1. Llene la boleta para personas que desean hablar que se encuentran en la entrada de la Sala de la Junta.
2. Entregue la boleta para personas que desean hablar al personal de MTS que se encuentra sentado en la entrada de la Sala de la Junta.
3. Cuando anuncien su nombre, por favor, acérquese al podio ubicado en el lado derecho de la tarima para hacer sus comentarios públicos.

Los miembros del público pueden hacer comentarios públicos generales al inicio de la agenda o comentarios específicos que hagan referencia a los puntos de la agenda durante el periodo de comentarios públicos. Los comentarios públicos generales únicamente al inicio de la reunión de la Junta de Directores, se limitarán a cinco personas que deseen hablar. Las personas adicionales que deseen aportar comentarios públicos generales podrán hacerlo al final de la reunión.

Dispositivos de Asistencia Auditiva (ALD, por sus siglas en inglés): Los ALD están disponibles con el secretario de la Junta* antes de la reunión y estos deberán ser devueltos al final de la reunión.

Facilidades Razonables: Según lo requerido por la Ley de Estadounidenses con Discapacidades (ADA, por sus siglas en inglés), para presentar solicitudes de información de la agenda en un formato alternativo o solicitar facilidades razonables para facilitar su participación en la reunión, por favor, comuníquese con el secretario de la Junta* por lo menos dos días hábiles antes de la reunión.

***Información de Contacto:** Comuníquese con el secretario de la Junta por correo electrónico en ClerkoftheBoard@sdmts.com, por teléfono al **(619) 398-9561** o por correo postal en **1255 Imperial Ave. Suite 1000, San Diego CA 92101.**

Metropolitan Transit System

Board of Directors

Agenda

June 26, 2025 at 9:00 a.m.

In-Person Participation: James R. Mills Building, 1255 Imperial Avenue, 10th Floor Board Room, San Diego CA 92101

Teleconference Participation: (669) 254-5252; Webinar ID: 160 280 5839, https://www.zoomgov.com/j/1602805839

NO.	ITEM SUBJECT AND DESCRIPTION	ACTION
1.	**Roll Call**	
2.	**Public Comments** This item is limited to five speakers with two minutes per speaker. Others will be heard after Board Discussion items. If you have a report to present, please give your copies to the Clerk of the Board.	
	CONSENT ITEMS	
3.	**Approval of Minutes** Action would approve the May 15, 2025 Board of Directors meeting minutes.	Approve
4.	**CEO Report**	Informational
5.	**Copley Park Division (CPD) Modular Building Replacement Design-Build Bridging Documents – Sole Source Work Order Amendment** Action would 1. Ratify Sole Source Work Order WOA355-AE-44, under MTS Doc No. PWL355.0-22, with Psomas in the amount of $123,205.20 for preliminary design services to generate program validation documents as part of the design-build bridging documents package for the replacement of the existing modular building at CPD; and 2. Authorize the Chief Executive Officer (CEO) to execute Work Order WOA355-AE-44.01 under MTS Doc No. PWL355.0-22, with Psomas, in the amount of $357,356.64, to provide engineering design services to compile a complete package of design-build bridging documents for the replacement of the existing modular building at CPD and for preliminary submission to the City of San Diego for multi-disciplinary review and approval.	Approve
6.	**Purchase of Class E Cutaway Vehicles – Contract Award** Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. B0782.0-25, with Model 1 Commercial Vehicles, Inc. (formerly Creative Bus	Approve

Sales), for the purchase of three (3) Class E Gas Powered Cutaway Vehicles in the amount of $845,161.05.

7. **Iris Rapid Transit Center East and Bus Stops Construction Management Services (CM) – Work Order Amendment** — Approve

Action would authorize the Chief Executive Officer (CEO) to execute Work Order No. WOA2498-CM19.01 under MTS Doc. No. G2498.0-21, with Kleinfelder Construction Services, Inc. (KCS), in the amount of $605,895.93 for additional construction management services for the Iris Rapid Transit Center East and Bus Stops Construction Project..

8. **California Department of Transportation (Caltrans) Program of Projects for Federal Fiscal Year (FFY) 2025 Federal Transit Administration (FTA) Section 5311 Formula Funding** — Approve

approve Resolution No. 25-05 authorizing the use of and application for $220,483.00 of FFY 2025 Section 5311 funds for operating assistance in rural areas.

9. **California Department of Transportation (Caltrans) Program of Projects for Federal Fiscal Year (FFY) 2025 Federal Transit Administration (FTA) Intercity Bus Program 5311(f) - Competitive Funding** — Approve

Action would approve Resolution No. 25-06, authorizing the use of and application for $300,000.00 of FFY 2025 Section 5311(f) – Competitive funding for operating assistance in non-urbanized areas.

10. **Darktrace Cybersecurity Software - Contract Amendment** — Approve

Action would authorize the Chief Executive Officer (CEO) to execute Amendment No. 5 to MTS Doc. No. G2386.0-20, with Darktrace Limited (Darktrace), for Cyber Security Software Licensing in the amount of $283,426.00 for a 12-month contract time extension.

11. **Facility Roof Solar Assessments – Work Order Agreement** — Approve

Action would authorize the Chief Executive Officer (CEO) to execute Work Order Amendment WOA356-AE-55 under MTS Doc No. PWL356.0-22 with Pacific Railway Enterprises, Inc. (PRE), Disadvantaged Business Enterprise (DBE), in the amount of $219,161.44 to provide engineering services to assess the installing rooftop solar on MTS existing facilities.

12. **Operations Budget Status Report for April 2025 (Gordon Meyer)** — Informational

13. **Beyer Boulevard Slope Improvement Construction Management (CM) and Inspection Services – Sole Source Contract Award** — Approve

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. PWG438.0-25, with Accenture Infrastructure and Capital Projects, LLC ((Accenture); formerly Anser Advisory Management, LLC), for CM and inspection services for the Beyer Boulevard Slope Improvements Project in the amount of $638,267.96.

14. **NetCloud License Renewal – Contract Award** — Approve

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G3048.0-25, with GovSmart Inc., for the NetCloud License Renewals through July 10, 2028, for a total of $682.876.92.

15. **S7 Replacement Design: 12th and Imperial and Blue Line Project – Funds Transfer** — Approve

Action would authorize the transfer of Transportation Development Act (TDA) funding in the amount of $2,500,000.00 from the Wheel Sensor Device (WSD) & SICAS S7 Replacement: Broadway Wye and India Crossover Project (CIP 2005114501) to the S7 Replacement Design: 12th and Imperial and Blue Line Project (CIP 2005118801).

16. **Bus Tire Lease and Services – Contract Award** — Approve

Action would authorize the Chief Executive Officer (CEO) to 1. Execute MTS Doc. No. B0780.0-25 with Michelin North America, Inc. (Michelin) for Bus Tire Lease and Services for a five (5) year base period with two (2) 1-year options, and an estimated run-out period of up to three(3) years for a total of $14,078,962.82; and 2. Exercise the option years at the CEO's discretion.

17. **Uninterruptible Power Supply (UPS) On-Site Maintenance Support Services – Sole Source Contract Award** — Approve

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G3075.0-25 with Schneider Electric IT Corporation (Schneider), on a sole source basis, for the provision of on-site UPS maintenance support services for a period of five (5) years in the amount of $1,073,264.20.

18. **The San Diego Metropolitan Transit System (MTS) Board Policy No. 13 Conflict of Interest Regarding Service Contracts – Policy Revision** — Approve

Action would adopt the proposed revisions to MTS Board Policy No. 13 Conflict of Interest Regarding Service Contracts.

19. **Appointment of Vice Chair for 2025 Public Security Committee** — Approve

Action would approve the appointment of Board Member Patricia Dillard as the Vice Chair for the Public Security Committee for 2025.

20. **Beyer Boulevard Trolley Station Transit-Oriented Development – Amendment to Disposition and Development Agreement** — Approve

Action would authorize the Chief Executive Officer (CEO) to 1. Execute an Amendment to the Disposition and Development Agreement (Amended DDA) with Beyer Family Housing L.P. for a Beyer Boulevard Trolley Station Transit Oriented Development Project, MTS Doc. No. G2589.1-22 and 2. Take all actions necessary to fulfill MTS's obligations under the Amended DDA, including, but not limited to, executing a Ground Lease and related regulatory agreements for each project phase.

21. **Donation of Buses That Have Exceeded Minimum Useful Life to Los Angeles Metropolitan Transportation Authority (LA Metro) – Agreement Approval (2/3 Vote Required)** — Approve

Action would authorize the Chief Executive Officer (CEO) to negotiated and execute MTS Doc. No. B0783.0-25 for the donation of up to 53 buses to LA Metro in advance of the 2028 Summer Olympic and Paralympic Games (2028 Summer Olympics).

22. **Disbursement of Chula Vista Billboard Reserve Fund – Fund Transfer** — Approve

Action would approve the disbursement of $2,700,000.00 to the City of Chula Vista for the Chula Vista Bayfront Shuttle Service (Shuttle) pursuant to the "Agreement Between the City of Chula Vista and the Metropolitan Transit Development Board for Continuation of the Chula Vista Billboard Reserve Fund and Expenditure of Revenues within the Fund" (Billboard Reserve Agreement) (MTDB Doc. No. S200-00-102).

23. **South Bay Maintenance Facility (SBMF) Zero Emission Bus (ZEB) Backup Power Project– Contract Award** — Approve

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. PWB437.0-25, with G A Abell, Inc. dba Precision Electric Co., for the SBMF ZEB Backup Power Construction Project in the amount of $6,734,024.00 plus 10% contingency.

DISCUSSION ITEMS

24. **Semiannual Uniform Report of Disadvantaged Business Enterprise (DBE) Awards and Payments (Samantha Leslie)** — Informational

25. **Transit Operations Insourcing Feasibility Study – Task 2 – Operational and Administrative Concept Plan (James Gerken and Russ Chisholm with Transportation Management Design (TMD), Inc. and Mike Daney)** — Informational

26. **Zero Emission Bus (ZEB) Program and Transition Plan Update (Mike Wygant and Jarrett Valdez)** — Informational

27. **Revisions to MTS Board Policy 21, "MTS Revenue-Generating Display Advertising, Concessions, and Merchandise" (Mark Olson)** — Approve

Action would recommend that the Board conclude the alcohol advertising pilot period and make permanent the revisions to MTS Board Policy No. 21, "MTS Revenue-Generating Display Advertising, Concessions, and Merchandise" approved on June 15, 2023.

OTHER ITEMS

28. **Chair, Board Member and Chief Executive Officer's (CEO's) Communications**

29. Remainder of Public Comments Not on The Agenda

This item is a continuation of item No. 2 (Public Comment), in the event all speakers who request to comment on item No. 2 are not called. If all Public Comment is accepted during item No. 2, no additional public comment will be accepted under this item.

30. Next Meeting Date

The next Board of Director's meeting is scheduled for July 17, 2025 at 9:00am.

CLOSED SESSION

31. Public Comment for Closed Session

32. Closed Session - Conference with Labor Negotiators Pursuant to California Government Code Section 54957.6 — Possible Action

Agency: San Diego Trolley, Inc. ("SDTI")
Employee Organization: International Brotherhood of Electrical Workers, Local 465 ("IBEW") (Construction Safety Flagpersons)
Agency- Designated Representative: Jeffrey M. Stumbo, Chief Human Resources Officer (EEO Officer)

33. Closed Session - Public Employee Performance Evaluation/ Conference with Labor Negotiators – Chief Executive Officer Pursuant to California Government Code Sections 54957 and 54957.6; — Possible Action

Agency-Designated Representative: Stephen Whitburn, Chair
Employee: Sharon Cooney, CEO

34. Adjournment

MINUTES

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM

BOARD OF DIRECTORS

May 15, 2025

[Clerk's note: Except where noted, public, staff and board member comments are paraphrased. The full comment can be heard by reviewing the recording at the MTS website.]

1. Roll Call

Chair Whitburn called the Board meeting to order at 9:02 a.m. A roll call sheet listing Board member attendance is attached as Attachment A.

2. Public Comment

Lorenzo Pimentel – Made a verbal statement to the Board during the meeting. Pimentel expressed support for the accessibility of MTS Access service but described the current barriers he faced due to a recent service change that eliminated pickups from his residence. He emphasized the danger and difficulty of reaching new pickup locations due to his physical and visual impairments.

Stacy Williams – Representing the TRACE program at San Diego Unified School District, made a verbal statement to the Board during the meeting. Williams advocated for Lorenzo as his case manager, citing the hazards in his surrounding environment and the emotional impact on his independence. She urged the board to make an Americans with Disabilities (ADA) accommodation exception.

Elijah Rubottom –Made a verbal statement to the Board during the meeting. Rubottom expressed frustration for Lorenzo, highlighting the safety hazards and the opportunity for multiple family members to access MTS if MTS Access service resumed at Lorenzo's home.

Jacqueline Romero – Made a verbal statement to the Board during the meeting. Romero appealed to the board as a special education teacher, emphasizing that accessibility should not be denied based on proximity boundaries, especially when it jeopardizes student safety and independence.

Alex Wong – Made a verbal statement to the Board during the meeting. Wong voiced concern over the airport trolley concept, warning that merging it with the Green and Blue Line tracks could create bottlenecks and limit service capacity.

Marco Espinosa – Made a verbal statement to the Board during the meeting. Espinosa proposed a new bus route from Old Town to Mount Soledad, incorporating stops at senior centers and transit hubs.

CONSENT ITEMS:

3. Approval of Minutes

Action would approve the April 17, 2025 Board of Director meeting minutes.

4. CEO Report

5. Investment Report – Quarter Ending March 31, 2025

6. Non-Revenue Vehicle Camera System – Contract Award

Action would authorize the Chief Executive Officer (CEO) to: 1) Execute MTS Doc. G2950.0-24 with Motive Technologies, Inc. (Motive), for a Non-Revenue Vehicle Camera System for a five (5) year base period with three (3) 1-year options, for a total amount of $1,070,655.00; and 2) Exercise the option years at the CEO's discretion.

7. Increased Authorization for Legal Services Contracts to Pay Projected Expenses through Fiscal Year 2026 (FY26) – Contract Amendment

Action would authorize the Chief Executive Officer (CEO) to execute amendments to twelve (12) legal services contracts increasing the funding authorization by $2,770,000.00 to cover anticipated expenses through FY26.

8. Operations Budget Status Report for March 2025

9. First Responder Network (FirstNet) Services – Contract Amendment

Action would 1) Ratify Amendment No. 3 to MTS Doc. No. G2377.0-20 with AT&T Corp. (AT&T), for the static Internet Protocol (IP) address block set up and recurring monthly charges at no cost due to available extra contract capacity; and 2) Authorize the Chief Executive Officer (CEO) to Execute Amendment No. 4 to MTS Doc. No G2377.0-20 with AT&T, to extend the agreement through August 11, 2029, to coincide with the amended National Association of State Procurement Offices (NASPO) ValuePoint Cooperative Purchasing Agreement Master Agreement (Master Agreement) 149 exercised option.

10. Beyer Blvd Pathway Beautification Project Art Concepts – Contract Award

Action would 1) Authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. PWG410.0-25 with Alicia Siu, for artistic services, inclusive of conceptualization, design and installation and an as-needed five-year maintenance plan for Art Concept 1 located along the Beyer Pathway near the Blvd. Trolley Station in San Diego in the amount of $55,500.00; and 2) Authorize the CEO to execute MTS Doc. No. PWG.440.0-25 with Johnny Bear Contreras, DBA Johnny Bear Art, for artistic services inclusive of conceptualization, design and installation and an as-needed five (5) year maintenance plan for Art Concept 2 located along the Beyer Pathway near the Blvd. Trolley Station in San Diego in the amount of $48,850.00.

11. Weed Abatement Services – Contract Award

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. PWL429.0-25 with Baja Wildlife Control for up to a five-year (5) period for weed abatement service of all MTS rail right-of-way (ROW) in the amount of $378,300.00.

12. HASTUS Regional Scheduling System Annual Software Maintenance and Support Services – Sole Source Contract Award

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G3068.0-25 with GIRO, Inc. (GIRO), on a Sole Source basis, for the provision of HASTUS Regional Scheduling System (RSS) annual software maintenance and support services for a period of three (3) years in the amount of $1,258,437.00.

13. Hewlett Packard Enterprise (HPE) Closed Circuit Television (CCTV) Servers – Contract Award

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G3010.0-

25 with Nth Generation Computing (Nth Generation), for the purchase of HPE CCTV Servers for a five (5) year period, for a total of $443,871.75.

14. Cisco Hardware and Subscription – Contract Award

Action would authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G2979.0-25 with Insight Public Sector Inc. (Insight) for the purchase of Cisco Hardware and Subscription, for a total of $663,463.40.

15. South Bay Maintenance Facility (SBMF) Zero Emission Bus (ZEB) Overhead Charging Phase 2 Design Services – Work Order Agreement

Action would authorize the Chief Executive Officer (CEO) to execute Work Order WOA353-AE-51 under MTS Doc No. PWL353.0-22 with Dokken Engineering (Dokken), in the amount of $1,737,483.85 to provide engineering design services for Phase 2 of the SBMF electric bus charging infrastructure project.

16. Battery Electric Bus (BEB) Fire and Life Safety Study – Work Order Agreement

Action would authorize the Chief Executive Officer (CEO) to execute Work Order Amendment WOA353-AE-28 under MTS Doc No. PWL353.0-22 with Dokken Engineering (Dokken) in the amount of $153,546.13 to provide an engineering study service for fire and life safety of MTS bus maintenance facilities related to BEBs.

17. Orange Line Improvement Project (OLIP) Phase 2: Procurement of Prewired Signal Houses and Related Materials –– Contract Award

Action would 1) Authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. L1691.0-25 with Diverging Approach, Incorporated (DAI) in the amount of $6,563,227.74 for the purchase of prewired signal houses and related materials for Phase 2 of the Orange Line Improvement Project; and 2) Authorize the CEO to execute amendments or change orders up to 10% contingency ($656,322.77) for this contract, bringing the total expenditure authority to $7,219,550.51.

18. Broadway & C Street Wheel Counter and Signal Replacement Construction Management Services– Contract Award

Action would authorize the Chief Executive Officer (CEO) to execute Work Order No. WOA2498-CM30 under MTS Doc No. G2498.0-21 with Kleinfelder Construction Services, Inc., in the amount of $156,269.58 for Construction Management (CM) services on the Broadway & C Street Wheel Counter and Signal Replacement project.

19. Fiscal Year (FY) 2024-2025 Low Carbon Transit Operations Program (LCTOP) Funding

Action would 1) Rescind MTS Resolution No. 25-02 adopted on April 17, 2025; and 2) Adopt MTS Resolution No. 25-04 to: a) Agree to comply with all conditions and requirements set forth in the Certification and Assurances Document, and applicable statutes, regulations, and guidelines for all LCTOP funded transit projects; b) Authorize the Chief Executive Officer (CEO), or designated representative, to execute all required documents of the LCTOP and any amendments thereto with the California Department of Transportation; c) serving Disadvantaged Communities (DAC); and d) Certify that at least 50% of the total LCTOP funds received will be spent on projects or services that will benefit DACs identified in Section 39711 of the Health and Safety Code**.**

Public Comment for item 6, 7 and 10

Cori Schumacher – Representing IBEW 569 made a verbal statement to the Board during the meeting. Schumacher questioned several consent items, particularly expenses related to public art and free shuttles, suggesting these reflect misplaced priorities during a budget deficit.

Board Comment

Board Member Moreno commented on Item 10, the Beyer Boulevard Pathway Beautification Project. She praised the public art components and highlighted their cultural and safety benefits. She commended MTS staff for long-term efforts and emphasized how this project served community needs.

Vice Chair Goble commented on Item 6, clarifying that the non-revenue vehicle camera system was intended for safety and liability documentation, not surveillance.

Action on Recommended Consent Items 3 - 19

Board Member Moreno moved to approve Consent Agenda Item Nos. 3 to 19. Vice Chair Goble seconded the motion, and the vote was 11 to 0 in favor with Board Member McCann, Board Member Bush, Board Member Montgomery Steppe and Board Member Vaus absent.

PUBLIC HEARINGS

20. Fiscal Year (FY) 2026 Operating Budget Discussion (Gordon Meyer)

Gordon Meyer, MTS Manager of Financial Planning, presented on the FY 2026 Operating Budget. He outlined: the budget development process, revenue assumptions, service levels, expense assumptions, consolidated revenues less expenses. He also provided a 5-year projection summary, ongoing concerns and staff's recommendations.

Public Comment

Corey Schumacher – Made a verbal statement to the Board during the meeting. Schumacher expressed dissatisfaction with the budget as borrowing from the future without a clear purpose, urging the board to reconsider its priorities and policy messaging.

Enimo Estrada – Made a verbal statement to the Board during the meeting. Estrada warned of long-term harm due to capital project deferrals and depletion of the operating reserve.

Ariana Federico – Made a verbal statement to the Board during the meeting. Federico urged the board to prioritize continued funding for the Youth Opportunity Pass (YOP).

Marco Espinosa – Made a verbal statement to the Board during the meeting. Espinosa expressed support for extending the YOP program.

Board Comment

Vice Chair Goble began by thanking the Chair and commending staff for a strong presentation. He brought attention to the issue of declining state revenue tied to diesel fuel and asked about the expected pace of its decline. He noted that while federal revenue remained flat, state funding, such as State Transit Assistant (STA) money, was a shrinking source due to clean air mandates. He inquired whether the operating forecast reflected this decline. Staff responded

that while the five-year operating forecast remained flat at $11.3 million, risks tied to revenue declines were incorporated into the Capital Improvement Program (CIP).

Vice Chair Global also referenced Slide 18 and expressed concern about rising operating costs, common across government agencies post-pandemic. He acknowledged that although personnel costs had been rising, recent successful recruitment, especially of bus drivers, might relieve some of that pressure. Staff explained that future personnel costs would likely reflect cost-of-living increases rather than major market adjustments, though rising minimum wages would still have an effect.

Board Member Moreno congratulated the team on the increase in ridership and the successful Senate Bill (SB)125 funding, crediting the board's past efforts and community engagement through the social equity tour. She echoed the concern regarding the sustainability of STA funding and requested a follow-up report on current balances in the ZEB CIP. She expressed urgency around ongoing capital projects in light of fiscal challenges and stressed the importance of transparency.

Board Member Moreno also highlighted the origins of the YOP program, attributing its inception to efforts by the social equity working group and encouraged the board chair to lead future funding discussions with the County. She expressed her personal support for wage increases for bus drivers and recalled being blindsided by the strike in the past. She emphasized that continued investment in programs like YOP was crucial and acknowledged the positive steps already included in the FY26 budget. She concluded by making a motion to approve the recommendation, acknowledging the difficulty of the current budget climate.

Board Member Downey clarified a public misconception by stating that Coronado’s free bus service was funded through their own general fund, not MTS’s budget. She stated her support for the YOP program, emphasizing the importance of encouraging public transit usage in her community, especially for students.

Board Member Hall raised concerns about the agency's long-term budget outlook, specifically asking about plans for fiscal years 2028–2030. Staff explained that they were exploring both revenue generation and internal cost reductions to avoid severe service cuts. Board Member Hall warned that without significant changes, the agency could face drastic service reductions, such as cutting trolley frequency.

Board Member Mendoza praised ridership growth but questioned whether increased service had been responsible for it. She asked if the growth justified the additional costs. Staff responded that while added service was part of the revenue forecast, fare recovery rates remained around 20%, making the service inherently subsidized. Staff also credited broader factors for increased ridership, including safety, cleanliness, and special event services.

Board Member Elo-Rivera expressed appreciation for the presentation but voiced concern over the agency's passive approach to non-fare revenue opportunities. He urged more aggressive pursuit of sponsorships, especially for valued programs like YOP and support for foster youth. He criticized the agency's current resource alignment and warned of long-term sustainability issues, particularly in security costs. His frustration stemmed from what he saw as a mismatch between the board’s values and its financial strategies.

Vice Chair Goble reviewed Slide 21, noting that without the $62 million from SB125, the fiscal cliff would have occurred a year earlier. He drew an analogy to aircraft landings urging the board and management to consider a “soft landing” via attrition and resource planning, rather

than a “hard landing” that could result from maintaining current staffing levels until a financial crisis hit. He emphasized that transit agencies statewide were in similar positions and encouraged forward-thinking fiscal strategy.

Chair Whitburn concluded the discussion by highlighting the agency’s recent successes in improving customer service. He referenced a customer satisfaction survey that showed MTS outperformed national averages in rider satisfaction. He credited investments in safety, cleanliness, and reliability, and outlined service increases, including expanded trolley frequency and a new overnight route. He acknowledged the urgency of fiscal sustainability and expressed support for exploring Director Elo-Rivera’s sponsorship proposal. Chair Whitburn seconded the motion.

Action Taken

Board Member Moreno moved to 1) Receive testimony, review, and comment on the FY 2026 MTS Operating Budget at a public hearing; and 2) Enact Resolution No. 25-03 adopting the FY 2026 operating budget for the MTS, San Diego Transit Corporation (SDTC), San Diego Trolley (SDTI), MTS Contract Services, and the Coronado Ferry. Chair Whitburn seconded the motion, and the vote was 8 in favor (Board Member: Downey, Fernandez, Foster, Mendoza, Leyba-Gonzalez, Dillard, Whitburn, Goble) to 2 opposed (Board Member: Hall, Elo-Rivera) and with Board Member McCann, Board Member Bush, Board Member Montgomery Steppe, Board Member Vaus and Board Member Moreno absent.

DISCUSSION ITEMS:

21. Fiscal Year (FY) 2025 Q3 Monitoring Report (Brent Boyd and Matthew Grace)

Brent Boyd, MTS Director of Planning & Scheduling, presented the FY 2025 Q3 Performance Monitoring Report. He provided details on: Board Policy 42, Policy 42 Evaluation Criteria, total ridership by month, ridership recovery from COVID on the Light Rail and Bus, passengers per revenue hour, on-time performance, financial metrics, and subsidy per passenger.

Public Comment

Alex Wong – Made a verbal statement to the Board during the meeting. Wong urged MTS to prioritize increasing transit frequency, especially on busy routes, to improve both safety and reliability. He warned against complacency and stressed that improving service, not just affordability, is key to attracting and retaining riders.

Marco Espinosa – Made a verbal statement to the Board during the meeting. Espinosa expressed strong support for rail expansion, electric buses, and enhancing trolley service with features like double-decker cars to improve rider comfort and community experience.

Action Taken

Informational item only. No action taken.

22. Comprehensive Operational Analysis – Contract Award (Brent Boyd and Brianda Diaz)

Brent Boyd, MTS Director of Planning & Scheduling, presented on Comprehensive Operational Analysis – Contract Award. He presented on: what is a Comprehensive Operational Analysis (COA), goals of the COA, planning scenarios of the COA, and COA tasks. Mr. Boyd also provided details on Transportation Management & Design, Inc. (TMD) and the COA timeline.

Brianda Diaz, MTS Procurement Specialist, outlined the solicitation process, initial review, final scores and ranking, and staff's recommendation.

Public Comment

Alex Wong – Made a verbal statement to the Board during the meeting. Wong recommended preserving frequent bus service in high-ridership, low-income areas and suggested cutting lower-ridership commuter routes to improve equity and efficiency.

Marco Espinosa – Made a verbal statement to the Board during the meeting. Espinosa suggested repurposing a recently vacated office space formerly used by a bail bonds tenant on MTS or SANDAG-owned property downtown as a break room and restroom facility for bus drivers, given its proximity to their current parking and rest area.

Board Comment

Board Member Elo-Rivera expressed appreciation for the presentation and acknowledged the potential benefits of the COA. He raised concerns about whether the COA would incorporate analysis on securing sponsorships or identifying alternative funding sources beyond fare or tax revenue. Staff clarified that the COA's focus was solely on service planning and did not include financial or safety-related evaluations.

Elo-Rivera emphasized his preference for improving safety through infrastructure and environmental design rather than through increased security personnel. He questioned whether such approaches such as supportive facility improvements would be considered within the COA scope. Staff responded that while safety strategies were not the primary focus, the COA would analyze supportive facilities like stop and station enhancements under both revenue scenarios.

Elo-Rivera concluded by urging the team to ensure the broader picture is considered, even if certain elements fall outside the COA scope.

Board Member Foster sought clarification on the assumptions used in the COA, particularly regarding the placeholder figures of $75 million in additional revenue and the $110 million projected budget shortfall. He expressed concern that using these static numbers without active efforts to pursue new funding could result in a lack of progress on closing the fiscal gap.

He emphasized the importance of running revenue generating efforts concurrently with the COA process and voiced concern about returning to the board repeatedly without meaningful movement on securing additional funding. Staff clarified that while the COA consultant would not explore revenue options, MTS staff would pursue those opportunities in parallel, including ballot measures, sponsorships, and other strategies. Foster confirmed that he expected those revenue efforts to move forward in tandem with the planning process to ensure long term system sustainability.

Board Member Hall invited consultants Russ Chisholm and Melissa Sather from TMD to respond to board discussions. He asked for their thoughts on the earlier comments made by Board Members Foster and Elo-Rivera, and the broader discussion the board had been engaging in regarding funding challenges and planning priorities.

Mr. Chisholm shared insights from his four decades of transit planning experience, emphasizing that funding levels fluctuate over time, and successful planning involves simultaneously seeking cost efficiency and new revenue opportunities. He stressed that the COA is not a stand-alone solution but one tool among many for addressing MTS's financial challenges. Mr. Chisolm

explained that the COA process would be highly collaborative, involving close work with the board, stakeholders, and community members to ensure alignment with shared values and goals.

He clarified that the analysis would help identify how to restructure the transit network under both revenue rich and deficit scenarios not only to manage cuts but also to enhance ridership. Drawing from the prior COA, he noted that service redesign resulted in $10 million in annual savings, mostly achieved through smarter service delivery and increased ridership rather than direct service cuts.

Ms. Sather added that the COA's core purpose is to realign MTS's services with current community needs and travel patterns. Since the last major service review in 2017, significant changes have occurred, making it essential to reevaluate each route's frequency and alignment. She emphasized that optimizing the network, regardless of the fiscal scenario, would improve reliability, rider satisfaction, and system efficiency.

Board Member Hall concluded the discussion by urging that the financial planning should reflect a realistic worst case scenario. He advised that the actual fiscal shortfall in 2030 may be closer to $145 million, not the $100–110 million projected, and suggested planning efforts should be adjusted accordingly.

Vice Chair Goble raised a question about how service cuts would be evaluated during the COA. He highlighted the need to balance two perspectives: one that focuses strictly on financial efficiency, and another that considers board values such as maintaining service in historically underserved areas even if they aren't the most cost effective.

Ms. Sather explained that the approach would be a blend of both considerations. They would first seek operational efficiencies such as schedule adjustments and route alignment tweaks before resorting to service reductions. Additionally, board values and equity would be integral to the decision-making process. Mr. Chisholm emphasized that this was why board workshops and community engagement were planned to ensure that service decisions reflect both financial realities and community priorities.

Vice Chair Goble confirmed that the workshops would include open sessions involving the public and Non-Government Organizations, which staff assured him would be the case.

Chair Whitburn asked a follow-up question about how community input would influence the final deliverables of the COA. He wanted clarity on how public feedback would be incorporated into the planning process.

Ms. Sather responded by affirming that every COA involves extensive public engagement, starting with identifying community priorities such as service frequency and coverage. These priorities differ across communities, and the input helps tailor the plan whether it's creating local circulators for shopping or addressing commuter travel patterns. She confirmed that public feedback would directly shape the recommendations, which will focus on route alignments, service frequencies, and spans, resulting in a comprehensive plan that reflects current community needs.

Action Taken

Board Member Hall moved to authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G3042.0-25 with Transportation Management & Design, Inc. (TMD), a Disadvantaged

Business Enterprise (DBE), for a Comprehensive Operational Analysis for a two (2) year period, for a total amount of $682,576.31. Chair Whitburn seconded the motion, and the vote was 10 to 0 in favor with Board Member McCann, Board Member Bush, Board Member Montgomery Steppe, Board Member Vaus and Board Member Moreno absent.

OTHER ITEMS:

23. Chair, Board Member and Chief Executive Officer's (CEO's) Communications

Board Member Leyba-Gonzalez thanked the MTS outreach team for participating in the fourth annual career fair at Mar Vista High School. He noted that the event was a success and expressed hope that it would help attract new employees to the agency.

Vice Chair Goble shared that the City of El Cajon had launched a micro transit program called Via San Diego, funded by a 2-year grant from SANDAG. The service allows residents to travel point-to-point anywhere within the city for $2.50, including connections to bus stops and trolley stations. He highlighted its accessibility for individuals with disabilities and encouraged MTS to collaborate with Via San Diego to cross promote the service as part of expanding transit options.

Board Member Mendoza noted that it was SANDAG's Bike Anywhere Day and shared a personal anecdote to highlight multimodal transit use. She rode her bike a mile and a half from her home to the Lemon Grove MTS station and took the trolley to the meeting. While at the station, she observed four other cyclists doing the same. Although they were unaware it was Bike Anywhere Day, they mentioned they regularly commute this way. Mendoza emphasized that it was encouraging to see people using both bicycles and MTS for their daily travel.

Sharon Cooney announced that Joanne Delgado is now serving as Deputy Clerk of the Board and continues as General Counsel's Assistant. She successfully managed the current board meeting. Lucia Mansour has been appointed Clerk of the Board starting today and is also the CEO's new Executive Assistant. She previously worked in the Finance Department and has clerked for both the Budget Development Committee and prior board meetings. Diana Hernandez, who works in Contract Services at Bus Operations, continues to clerk the Accessible Services Advisory Committee (ASAC). She noted that board members will see more of these staff members throughout the year.

Chair Whitburn expressed appreciation to Joanne Delgado, Lucia Mansour, and Diana Hernandez for their excellent work. He acknowledged their contributions and stated that the board looks forward to continuing their collaboration in future meetings.

ADJOURNMENT

24. Next Meeting Date

The next regularly scheduled Board meeting is June 26, 2025 at 9 a.m.

25. Adjournment

The meeting was adjourned at 11:49 a.m.

Chairperson
San Diego Metropolitan Transit System

Filed by:

Clerk of the Board
San Diego Metropolitan Transit System

Approved as to form:

General Counsel
San Diego Metropolitan Transit System

Attachment: A. Roll Call Sheet

SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS
ROLL CALL

MEETING OF (DATE): May 15, 2025 CALL TO ORDER (TIME): 9:02 a.m.

RECESS: RECONVENE:

CLOSED SESSION: RECONVENE:

PUBLIC HEARING: RECONVENE:

ORDINANCES ADOPTED: ADJOURN: 11:49 a.m.

JURISDICTION	BOARD MEMBER		ALTERNATE		PRESENT (TIME ARRIVED)	ABSENT (TIME LEFT)
City of Chula Vista	Fernandez	☒	Preciado	☐	9:02 a.m.	11:49 a.m.
City of Chula Vista	McCann	☐	Preciado	☐		ABSENT
City of Coronado	Downey	☒	Fleming	☐	9:02 a.m.	11:49 a.m.
County of San Diego	Montgomery Steppe	☐	VACANT	☐	ABSENT	ABSENT
City of El Cajon	Goble (Vice-Chair)	☒	Ortiz	☐	9:02 a.m.	11:49 a.m.
City of Imperial Beach	Leyba-Gonzalez	☒	Aguirre	☐	9:02 a.m.	11:49 a.m.
City of La Mesa	Dillard	☒	Arapostathis	☐	9:02 a.m.	11:49 a.m.
City of Lemon Grove	Mendoza	☒	Faiai	☐	9:02 a.m.	11:49 a.m.
City of National City	Bush	☐	Rodriguez	☐	ABSENT	ABSENT
City of Poway	Vaus	☐	De Hoff	☐	ABSENT	ABSENT
City of San Diego	Moreno	☒	Campbell	☐	9:02 a.m.	10:37 a.m.
City of San Diego	Elo-Rivera	☒	LaCava	☐	9:02 a.m.	11:49 a.m.
City of San Diego	Gloria	☐	Foster	☒	9:02 a.m.	11:49 a.m.
City of San Diego	Whitburn (Chair)	☒	Lee	☐	9:02 a.m.	11:49 a.m.
City of Santee	Hall	☒	Koval Minto	☐ ☐	9:02 a.m.	11:49 a.m.

SIGNED BY THE CLERK OF THE BOARD: /S/ Joann Delgado

Agenda Item No. 4

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Chief Executive Officer's (CEO) Report

INFORMATIONAL

In accordance with Board Policy No. 52, "Procurement of Goods and Services", attached are listings of contracts, purchase orders, and work orders that have been approved within the CEO's authority (up to and including $150,000) for the period May 8, 2025 – June 18, 2025.

Also attached are reports for Purchase Orders (Attachment A), Expenses and Revenue Contracts (Attachment B) and Emergency Purchase Orders (Attachment C).

CEO TRAVEL REPORT (since last Board meeting)

Monday, June 23, 2025 – CTA Executive Committee meeting (Sacramento, CA)

BOARD MEMBER TRAVEL REPORT (since last Board meeting)

N/A

Attachments: A. Purchase Orders
B. Expense and Revenue Contracts
C. Emergency Purchase Orders

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4400003357	5/8/2025	W.W. Grainger Inc		G130-SHOP TOOLS	$95.46	$ -	$ -
4400003358	5/9/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$1,153.01	$ -	$ -
4400003359	5/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$2,451.93	$ -	$ -
4400003360	5/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$163.00	$ -	$ -
4400003361	5/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$483.77	$ -	$ -
4400003362	5/12/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$62.10	$ -	$ -
4400003363	5/13/2025	W.W. Grainger Inc		G130-SHOP TOOLS	$1,072.51	$ -	$ -
4400003364	5/14/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$256.11	$ -	$ -
4400003365	5/15/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$228.57	$ -	$ -
4400003366	5/20/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$21.53	$ -	$ -
4400003367	5/20/2025	W.W. Grainger Inc		G130-SHOP TOOLS	$86.89	$ -	$ -
4400003368	5/20/2025	Mcmaster-Carr Supply Co		G130-SHOP TOOLS	$69.11	$ -	$ -
4400003369	5/21/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$83.41	$ -	$ -
4400003370	5/22/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$549.23	$ -	$ -
4400003371	5/22/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$30.00	$ -	$ -
4400003372	5/22/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$289.44	$ -	$ -
4400003373	5/22/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$264.52	$ -	$ -
4400003374	5/22/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$439.88	$ -	$ -
4400003375	5/22/2025	Mcmaster-Carr Supply Co		G150-FASTENERS	$450.15	$ -	$ -
4400003376	5/27/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$156.86	$ -	$ -
4400003377	5/28/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$982.96	$ -	$ -
4400003378	5/28/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$90.78	$ -	$ -
4400003379	5/28/2025	Mcmaster-Carr Supply Co		F230-METALS/FERROUS	$169.58	$ -	$ -
4400003380	5/28/2025	ODP Business Solutions, LLC		G230-PRINTED MATERIALS	$111.24	$ -	$ -
4400003381	6/2/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$603.01	$ -	$ -
4400003382	6/2/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$1,895.01	$ -	$ -
4400003383	6/2/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$75.43	$ -	$ -
4400003384	6/3/2025	W.W. Grainger Inc		G190-SAFETY/MED SUPPLIES	$3,394.55	$ -	$ -
4400003385	6/3/2025	Mcmaster-Carr Supply Co		F230-METALS/FERROUS	$645.25	$ -	$ -
4400003386	6/4/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$332.51	$ -	$ -
4400003387	6/5/2025	Mcmaster-Carr Supply Co		R230-RAIL/LRV MECHANICAL	$300.79	$ -	$ -
4400003388	6/5/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$241.77	$ -	$ -
4400003389	6/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$226.94	$ -	$ -
4400003390	6/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$59.93	$ -	$ -
4400003391	6/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$45.16	$ -	$ -
4400003392	6/9/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$132.21	$ -	$ -
4400003393	6/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$136.72	$ -	$ -
4400003394	6/9/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$95.69	$ -	$ -
4400003395	6/10/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$76.71	$ -	$ -
4400003396	6/12/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$48.77	$ -	$ -
4400003397	6/17/2025	W.W. Grainger Inc		T150-TRACK, BRIDGES	$138.03	$ -	$ -
4500068118	5/8/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$5.93	$ -	$ -
4500068119	5/8/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$55.60	$ -	$ -
4500068120	5/8/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$2,048.44	$ -	$ -
4500068121	5/8/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$685.29	$ -	$ -
4500068122	5/8/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$3,507.30	$ -	$ -
4500068123	5/8/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$1,529.33	$ -	$ -
4500068124	5/8/2025	DI Technology Group, Inc	Small Business	I110-INFORMATION TECH	$2,169.00	$ -	$ -
4500068125	5/8/2025	Aztec Fire & Safety, Inc.		B250-BUS REPAIR PARTS	$902.72	$ -	$ -
4500068126	5/8/2025	GSAHTC, Inc.		P440-CATERING SERVICES	$271.83	$ -	$ -
4500068127	5/8/2025	Fastenal Company		G140-SHOP SUPPLIES	$2,268.96	$ -	$ -
4500068128	5/8/2025	Ascendancy Corp		R230-RAIL/LRV MECHANICAL	$4,294.16	$ -	$ -
4500068129	5/8/2025	RJ International LLC	DBE	G190-SAFETY/MED SUPPLIES	$782.27	$ -	$ -
4500068130	5/8/2025	Fastenal Company		G150-FASTENERS	$642.19	$ -	$ -
4500068131	5/8/2025	Teknoware Inc.		R180-RAIL/LRV LIGHTING	$2,720.47	$ -	$ -
4500068132	5/8/2025	Reid and Clark Screen Arts Co		R120-RAIL/LRV CAR BODY	$1,018.24	$ -	$ -
4500068133	5/8/2025	D's Kustom Sales & Services, LLC		T110-TRACK, RAIL	$643.13	$ -	$ -
4500068134	5/9/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$14.33	$ -	$ -
4500068135	5/9/2025	Transit Holdings Inc		B140-BUS CHASSIS	$1.57	$ -	$ -
4500068136	5/9/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$908.34	$ -	$ -
4500068137	5/9/2025	Muncie Reclamation and Supply Co		B140-BUS CHASSIS	$970.11	$ -	$ -
4500068138	5/9/2025	Transit Holdings Inc		B130-BUS BODY	$3,516.38	$ -	$ -
4500068139	5/9/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$6,908.19	$ -	$ -
4500068140	5/9/2025	Transit Holdings Inc		G140-SHOP SUPPLIES	$1,065.12	$ -	$ -
4500068141	5/9/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$4,363.88	$ -	$ -
4500068142	5/9/2025	Daniel Hopkins		P280-GENERAL SVC AGRMNTS	$45,000.00	$ -	$ -
4500068143	5/12/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,849.93	$ -	$ -
4500068144	5/12/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$3,954.32	$ -	$ -
4500068145	5/12/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$19.59	$ -	$ -
4500068146	5/12/2025	Transit Holdings Inc		B140-BUS CHASSIS	$14,802.50	$ -	$ -
4500068147	5/12/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$111.89	$ -	$ -
4500068148	5/12/2025	Cummins Inc		B250-BUS REPAIR PARTS	$589.30	$ -	$ -
4500068149	5/12/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$388.92	$ -	$ -
4500068150	5/12/2025	Transit Holdings Inc		G140-SHOP SUPPLIES	$3,372.19	$ -	$ -
4500068151	5/12/2025	AirSuppply Tools, LLC		G130-SHOP TOOLS	$49.69	$ -	$ -
4500068152	5/12/2025	VGP Holdings LLC		B200-BUS PWR TRAIN EQUIP	$1,647.50	$ -	$ -
4500068153	5/12/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$1,083.70	$ -	$ -
4500068154	5/12/2025	Supreme Oil Co.		A120-AUTO/TRUCK GASOLINE	$12,817.04	$ -	$ -
4500068155	5/12/2025	Graybar Electric Co Inc		I110-INFORMATION TECH	$3,179.39	$ -	$ -
4500068156	5/12/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$3,187.31	$ -	$ -
4500068157	5/12/2025	VCA Animal Hospitals, Inc.		G120-SECURITY	$203.52	$ -	$ -
4500068158	5/12/2025	Home Depot USA Inc		G220-OFFICE EQUIPMENT	$150.77	$ -	$ -
4500068159	5/12/2025	Gillig LLC		B250-BUS REPAIR PARTS	$704.08	$ -	$ -
4500068160	5/12/2025	The Webstaurant Store, Inc.		G190-SAFETY/MED SUPPLIES	$1,810.97	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068161	5/12/2025	Aztec Fire & Safety, Inc.		B250-BUS REPAIR PARTS	$2,801.50	$ -	$ -
4500068162	5/12/2025	Harbor Diesel & Equipment, Inc		B200-BUS PWR TRAIN EQUIP	$20,902.11	$ -	$ -
4500068163	5/13/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$2,279.86	$ -	$ -
4500068164	5/13/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$3,541.09	$ -	$ -
4500068165	5/13/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$1,508.16	$ -	$ -
4500068166	5/13/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$305.15	$ -	$ -
4500068167	5/13/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$249.12	$ -	$ -
4500068168	5/13/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$193.78	$ -	$ -
4500068169	5/13/2025	Transit Holdings Inc		B130-BUS BODY	$135.83	$ -	$ -
4500068170	5/13/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$106.93	$ -	$ -
4500068171	5/13/2025	Freeby Signs		B250-BUS REPAIR PARTS	$87.55	$ -	$ -
4500068172	5/13/2025	W.W. Grainger Inc		F110-SHOP/BLDG MACHINERY	$1,255.65	$ -	$ -
4500068173	5/13/2025	Gillig LLC		B250-BUS REPAIR PARTS	$3,109.31	$ -	$ -
4500068174	5/13/2025	Prudent Publishing Co Inc		G200-OFFICE SUPPLIES	$673.44	$ -	$ -
4500068175	5/13/2025	Steven R Timme		G230-PRINTED MATERIALS	$319.01	$ -	$ -
4500068176	5/13/2025	Quadient, Inc.		G200-OFFICE SUPPLIES	$378.74	$ -	$ -
4500068177	5/13/2025	Quadient, Inc.		P420-MAIL SERVICES	$644.09	$ -	$ -
4500068178	5/13/2025	Harbor Diesel & Equipment, Inc		B250-BUS REPAIR PARTS	$3,168.67	$ -	$ -
4500068179	5/13/2025	Madden Construction Inc		P280-GENERAL SVC AGRMNTS	$993.95	$ -	$ -
4500068180	5/13/2025	NS Corporation		F110-SHOP/BLDG MACHINERY	$3,673.66	$ -	$ -
4500068181	5/13/2025	Grah Safe & Lock Inc	Small Business	F110-SHOP/BLDG MACHINERY	$292.22	$ -	$ -
4500068182	5/13/2025	NS Corporation		F110-SHOP/BLDG MACHINERY	$1,079.20	$ -	$ -
4500068183	5/13/2025	Gillig LLC		B250-BUS REPAIR PARTS	$146.30	$ -	$ -
4500068184	5/13/2025	Gillig LLC		B250-BUS REPAIR PARTS	$217.82	$ -	$ -
4500068185	5/13/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$1,748.80	$ -	$ -
4500068186	5/13/2025	Cummins Inc		B250-BUS REPAIR PARTS	$214.85	$ -	$ -
4500068187	5/13/2025	Shilpark Paint Corporation		G160-PAINTS & CHEMICALS	$1,514.09	$ -	$ -
4500068188	5/13/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$14,073.23	$ -	$ -
4500068189	5/13/2025	Home Depot USA Inc		G140-SHOP SUPPLIES	$922.38	$ -	$ -
4500068190	5/13/2025	Hanning & Kahl LP		M150-PWR SWITCHES/LOCKS	$2,817.48	$ -	$ -
4500068191	5/13/2025	Otay Mesa Sales, Inc		P160-EQUIPMENT RENTALS	$1,963.96	$ -	$ -
4500068192	5/13/2025	Simmons-Boardman Books, Inc.		P540-MAINTENANCE TRAINING	$3,202.00	$ -	$ -
4500068193	5/13/2025	Cembre Inc		M120-OVRHEAD CATENARY SYS	$3,888.71	$ -	$ -
4500068194	5/13/2025	San Diego Hydraulics, Inc.		P210-NON-REV VEH REPAIRS	$1,833.99	$ -	$ -
4500068195	5/13/2025	Network Industries, Inc.		F110-SHOP/BLDG MACHINERY	$690.80	$ -	$ -
4500068196	5/13/2025	Harsco Rail LLC		P130-EQUIP MAINT REPR SVC	$178.28	$ -	$ -
4500068197	5/13/2025	Robcar Corporation	Woman Owned Business	G110-BUS/TROLLEY SIGNAGE	$570.01	$ -	$ -
4500068198	5/13/2025	Charter Industrial Supply Inc	Small Business	G130-SHOP TOOLS	$269.38	$ -	$ -
4500068199	5/13/2025	Network Industries, Inc.		G180-JANITORIAL SUPPLIES	$1,830.55	$ -	$ -
4500068200	5/13/2025	Daniels Tire Service, Inc		F180-BUILDING MATERIALS	$532.00	$ -	$ -
4500068201	5/13/2025	Fastenal Company		G150-FASTENERS	$2,411.85	$ -	$ -
4500068202	5/13/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$1,277.49	$ -	$ -
4500068203	5/13/2025	Home Depot USA Inc		F110-SHOP/BLDG MACHINERY	$822.89	$ -	$ -
4500068204	5/13/2025	Gillig LLC		B250-BUS REPAIR PARTS	$202.68	$ -	$ -
4500068205	5/14/2025	Transit Holdings Inc		B140-BUS CHASSIS	$1,023.67	$ -	$ -
4500068206	5/14/2025	Cummins Inc		B250-BUS REPAIR PARTS	$3,720.68	$ -	$ -
4500068207	5/14/2025	Transit Holdings Inc		B140-BUS CHASSIS	$1,348.20	$ -	$ -
4500068208	5/14/2025	Siemens Mobility, Inc.		R230-RAIL/LRV MECHANICAL	$3,262.62	$ -	$ -
4500068209	5/14/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$3,267.12	$ -	$ -
4500068210	5/14/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$384.10	$ -	$ -
4500068211	5/14/2025	Pacific Star Corporation		G180-JANITORIAL SUPPLIES	$58.46	$ -	$ -
4500068212	5/14/2025	Altec Inc		P210-NON-REV VEH REPAIRS	$1,070.45	$ -	$ -
4500068213	5/14/2025	M Power Truck & Diesel		P130-EQUIP MAINT REPR SVC	$2,495.84	$ -	$ -
4500068214	5/14/2025	OneSource Distributors, LLC		M180-STATION ELECTRICAL	$2,113.02	$ -	$ -
4500068215	5/14/2025	Shilpark Paint Corporation		G160-PAINTS & CHEMICALS	$744.95	$ -	$ -
4500068216	5/14/2025	Shilpark Paint Corporation		G140-SHOP SUPPLIES	$138.99	$ -	$ -
4500068217	5/14/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$234.61	$ -	$ -
4500068218	5/14/2025	Cummins Inc		B120-BUS MECHANICAL PARTS	$1,522.76	$ -	$ -
4500068219	5/14/2025	Neopart Transit LLC		B140-BUS CHASSIS	$746.82	$ -	$ -
4500068220	5/14/2025	TK Services Inc		B250-BUS REPAIR PARTS	$956.14	$ -	$ -
4500068221	5/14/2025	Gillig LLC		B140-BUS CHASSIS	$28,525.18	$ -	$ -
4500068222	5/14/2025	Muncie Reclamation and Supply Co		B160-BUS ELECTRICAL	$16,421.70	$ -	$ -
4500068223	5/14/2025	San Diego Friction Products, Inc.		B140-BUS CHASSIS	$1,675.73	$ -	$ -
4500068224	5/14/2025	Mohawk Mfg & Supply Co		B110-BUS HVAC SYSTEMS	$1,222.40	$ -	$ -
4500068225	5/14/2025	TK Services Inc		B110-BUS HVAC SYSTEMS	$5,459.98	$ -	$ -
4500068226	5/14/2025	Gillig LLC		B140-BUS CHASSIS	$407.60	$ -	$ -
4500068227	5/14/2025	Transit Holdings Inc		B130-BUS BODY	$17,783.75	$ -	$ -
4500068228	5/14/2025	Clarran Inc.	DBE	G140-SHOP SUPPLIES	$639.88	$ -	$ -
4500068229	5/14/2025	Prochem Specialty Products Inc	Small Business	G180-JANITORIAL SUPPLIES	$1,863.22	$ -	$ -
4500068230	5/14/2025	Romaine Electric Corporation		B160-BUS ELECTRICAL	$7,228.20	$ -	$ -
4500068231	5/14/2025	Genfare, LLC		G290-FARE REVENUE EQUIP	$4,336.55	$ -	$ -
4500068232	5/14/2025	Tribologik Corporation		G140-SHOP SUPPLIES	$3,261.38	$ -	$ -
4500068233	5/14/2025	RJ International LLC	DBE	G140-SHOP SUPPLIES	$357.39	$ -	$ -
4500068234	5/14/2025	B and H Photo and Electronics		R160-RAIL/LRV ELECTRICAL	$2,084.97	$ -	$ -
4500068235	5/14/2025	Gillig LLC		B110-BUS HVAC SYSTEMS	$4,403.38	$ -	$ -
4500068236	5/14/2025	Freeby Signs		B130-BUS BODY	$247.96	$ -	$ -
4500068237	5/14/2025	S.W.N.G. Inc		P280-GENERAL SVC AGRMNTS	$57,314.50	$ -	$ -
4500068239	5/14/2025	Jamison Professional Services, LLC	DBE	G170-LUBRICANTS	$298.16	$ -	$ -
4500068240	5/14/2025	San Diego Friction Products, Inc.		B140-BUS CHASSIS	$3,246.75	$ -	$ -
4500068241	5/14/2025	Harbor Diesel & Equipment, Inc		G170-LUBRICANTS	$6,776.28	$ -	$ -
4500068242	5/14/2025	R.S. Hughes Co Inc		G140-SHOP SUPPLIES	$987.39	$ -	$ -
4500068243	5/14/2025	Kurt Morgan		G200-OFFICE SUPPLIES	$2,104.43	$ -	$ -
4500068244	5/15/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,522.75	$ -	$ -
4500068245	5/15/2025	Transit Holdings Inc		B130-BUS BODY	$206.88	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068246	5/15/2025	Signal Hill Auto Enterprises, Inc.		G180-JANITORIAL SUPPLIES	$904.78	$ -	$ -
4500068247	5/15/2025	Cummins Inc		B120-BUS MECHANICAL PARTS	$7.30	$ -	$ -
4500068248	5/15/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$30.86	$ -	$ -
4500068249	5/15/2025	Transit Holdings Inc		B130-BUS BODY	$795.15	$ -	$ -
4500068250	5/15/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$152.74	$ -	$ -
4500068251	5/15/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$131.58	$ -	$ -
4500068252	5/15/2025	Transit Holdings Inc		B140-BUS CHASSIS	$7,232.18	$ -	$ -
4500068253	5/15/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$1,010.18	$ -	$ -
4500068254	5/15/2025	Siemens Mobility, Inc.		R120-RAIL/LRV CAR BODY	$532.29	$ -	$ -
4500068255	5/15/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,705.62	$ -	$ -
4500068256	5/15/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$2,055.87	$ -	$ -
4500068257	5/15/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$169.56	$ -	$ -
4500068258	5/15/2025	Transit Holdings Inc		B140-BUS CHASSIS	$5,905.89	$ -	$ -
4500068259	5/15/2025	Signal Hill Auto Enterprises, Inc.		G180-JANITORIAL SUPPLIES	$784.14	$ -	$ -
4500068260	5/15/2025	B & S Graphics Inc		B130-BUS BODY	$214.15	$ -	$ -
4500068261	5/15/2025	Louis Sardo Upholstery Inc		B130-BUS BODY	$960.92	$ -	$ -
4500068262	5/15/2025	Trentman Corp	Small Business	P280-GENERAL SVC AGRMNTS	$1,318.45	$ -	$ -
4500068263	5/15/2025	Prudential Overall Supply		G140-SHOP SUPPLIES	$3,488.53	$ -	$ -
4500068264	5/15/2025	Northwest Pump & Equipment Co		F110-SHOP/BLDG MACHINERY	$377.67	$ -	$ -
4500068265	5/15/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$3,804.07	$ -	$ -
4500068266	5/15/2025	Charter Industrial Supply Inc	Small Business	G150-FASTENERS	$271.53	$ -	$ -
4500068267	5/15/2025	Brady Industries of California, LLC		G180-JANITORIAL SUPPLIES	$1,581.54	$ -	$ -
4500068268	5/15/2025	Uline Inc		G140-SHOP SUPPLIES	$2,286.61	$ -	$ -
4500068269	5/15/2025	Dropbox Inc		I110-INFORMATION TECH	$1,440.00	$ -	$ -
4500068271	5/16/2025	Muncie Reclamation and Supply Co		B120-BUS MECHANICAL PARTS	$31.17	$ -	$ -
4500068272	5/16/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$319.37	$ -	$ -
4500068273	5/16/2025	Pacific Star Corporation		G180-JANITORIAL SUPPLIES	$58.46	$ -	$ -
4500068274	5/16/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$4,445.88	$ -	$ -
4500068275	5/16/2025	Transit Holdings Inc		B130-BUS BODY	$179.68	$ -	$ -
4500068276	5/16/2025	iPROMOTEu.com, Inc.		G260-MEDIA	$1,564.86	$ -	$ -
4500068277	5/16/2025	Ace Uniforms LLC	Small Business	C120-SPECIALTY CONTRACTOR	$407.24	$ -	$ -
4500068278	5/16/2025	Amazon.com Sales, Inc.		G200-OFFICE SUPPLIES	$230.00	$ -	$ -
4500068279	5/16/2025	A to Z Enterprises, Inc.		P300-TOWING SVCS	$180.00	$ -	$ -
4500068280	5/16/2025	CDW LLC		G200-OFFICE SUPPLIES	$389.52	$ -	$ -
4500068281	5/16/2025	Dimensional Silk Screen Inc		G230-PRINTED MATERIALS	$417.21	$ -	$ -
4500068282	5/16/2025	Uline Inc		G220-OFFICE EQUIPMENT	$4,894.77	$ -	$ -
4500068285	5/19/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$2.37	$ -	$ -
4500068286	5/19/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$154.90	$ -	$ -
4500068287	5/19/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$1,317.03	$ -	$ -
4500068288	5/19/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,791.71	$ -	$ -
4500068289	5/19/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$283.25	$ -	$ -
4500068290	5/19/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$75.46	$ -	$ -
4500068291	5/19/2025	Transit Holdings Inc		B140-BUS CHASSIS	$1,499.08	$ -	$ -
4500068292	5/19/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$197.22	$ -	$ -
4500068293	5/19/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$3,564.80	$ -	$ -
4500068294	5/19/2025	San Diego Friction Products, Inc.		B250-BUS REPAIR PARTS	$1,302.41	$ -	$ -
4500068295	5/19/2025	Vern Rose Inc		G140-SHOP SUPPLIES	$686.02	$ -	$ -
4500068296	5/19/2025	Airgas Inc		G140-SHOP SUPPLIES	$58.44	$ -	$ -
4500068297	5/19/2025	Motion Industries, Inc.		G130-SHOP TOOLS	$526.06	$ -	$ -
4500068298	5/19/2025	Harbor Diesel & Equipment, Inc		B120-BUS MECHANICAL PARTS	$341.90	$ -	$ -
4500068299	5/19/2025	Genfare, LLC		B190-BUS FARE EQUIP	$145.10	$ -	$ -
4500068300	5/19/2025	Aztec Fire & Safety, Inc.		G190-SAFETY/MED SUPPLIES	$913.72	$ -	$ -
4500068301	5/19/2025	Cummins Inc		B130-BUS BODY	$1,533.41	$ -	$ -
4500068302	5/19/2025	Cummins Inc		B250-BUS REPAIR PARTS	$229.53	$ -	$ -
4500068303	5/19/2025	R.S. Hughes Co Inc		G190-SAFETY/MED SUPPLIES	$133.42	$ -	$ -
4500068304	5/19/2025	Theobald Software Inc.		I120-INFO TECH, SVCS	$4,372.50	$ -	$ -
4500068305	5/19/2025	Applied Industrial		G140-SHOP SUPPLIES	$982.68	$ -	$ -
4500068306	5/19/2025	Winzer Franchise Company		G150-FASTENERS	$255.38	$ -	$ -
4500068307	5/19/2025	Fastenal Company		G130-SHOP TOOLS	$822.22	$ -	$ -
4500068308	5/19/2025	Professional Contractors Supplies		G130-SHOP TOOLS	$796.79	$ -	$ -
4500068309	5/19/2025	Siemens Mobility, Inc.		M130-CROSSING MECHANISM	$784.85	$ -	$ -
4500068310	5/19/2025	OneSource Distributors, LLC		G180-JANITORIAL SUPPLIES	$489.85	$ -	$ -
4500068311	5/19/2025	General Signals Inc		M140-WAYSIDE SIGNALS	$699.30	$ -	$ -
4500068312	5/19/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$1,646.86	$ -	$ -
4500068313	5/19/2025	RJ International LLC	DBE	G140-SHOP SUPPLIES	$466.10	$ -	$ -
4500068314	5/19/2025	Willy's Electronic Supply Co Inc		M180-STATION ELECTRICAL	$290.28	$ -	$ -
4500068315	5/19/2025	Init Innovations in Transportation		G290-FARE REVENUE EQUIP	$341.35	$ -	$ -
4500068316	5/19/2025	Siemens Mobility, Inc.		R120-RAIL/LRV CAR BODY	$1,724.00	$ -	$ -
4500068317	5/19/2025	Supreme Oil Co.		A120-AUTO/TRUCK GASOLINE	$14,603.37	$ -	$ -
4500068318	5/19/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$3,119.49	$ -	$ -
4500068319	5/19/2025	C and R Transfer		C120-SPECIALTY CONTRACTOR	$9,980.00	$ -	$ -
4500068320	5/19/2025	Peacock Enterprises Inc	Small Business	I110-INFORMATION TECH	$12,984.77	$ -	$ -
4500068321	5/19/2025	AirSuppply Tools, LLC		G140-SHOP SUPPLIES	$215.03	$ -	$ -
4500068322	5/19/2025	Peacock Enterprises Inc	Small Business	I110-INFORMATION TECH	$14,349.77	$ -	$ -
4500068323	5/20/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$413.46	$ -	$ -
4500068324	5/20/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$143.26	$ -	$ -
4500068325	5/20/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$272.88	$ -	$ -
4500068326	5/20/2025	Cummins Inc		G150-FASTENERS	$38.79	$ -	$ -
4500068327	5/20/2025	Transit Holdings Inc		B130-BUS BODY	$781.28	$ -	$ -
4500068328	5/20/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$146.57	$ -	$ -
4500068329	5/20/2025	Parts Authority, LLC		B160-BUS ELECTRICAL	$3,930.08	$ -	$ -
4500068330	5/20/2025	Interboro Packaging Corporation		G180-JANITORIAL SUPPLIES	$135.44	$ -	$ -
4500068331	5/20/2025	Signal Hill Auto Enterprises, Inc.		G180-JANITORIAL SUPPLIES	$668.05	$ -	$ -
4500068332	5/20/2025	Mike Farrar		B130-BUS BODY	$12,283.50	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068333	5/20/2025	AirSuppply Tools, LLC		G150-FASTENERS	$21.19	$ -	$ -
4500068334	5/20/2025	AirSuppply Tools, LLC		G140-SHOP SUPPLIES	$89.34	$ -	$ -
4500068335	5/20/2025	AirSuppply Tools, LLC		G140-SHOP SUPPLIES	$138.04	$ -	$ -
4500068336	5/20/2025	Aztec Fire & Safety, Inc.		B250-BUS REPAIR PARTS	$672.36	$ -	$ -
4500068337	5/20/2025	Grah Safe & Lock Inc	Small Business	F110-SHOP/BLDG MACHINERY	$624.97	$ -	$ -
4500068338	5/20/2025	Powerstride Battery Co. Inc.		F110-SHOP/BLDG MACHINERY	$203.12	$ -	$ -
4500068339	5/20/2025	Network Industries, Inc.		F200-TANK EQUIPMENT	$189.52	$ -	$ -
4500068340	5/20/2025	B and H Photo and Electronics		G220-OFFICE EQUIPMENT	$144.71	$ -	$ -
4500068341	5/20/2025	Continental Locks		P280-GENERAL SVC AGRMNTS	$115.00	$ -	$ -
4500068342	5/20/2025	Uline Inc		F110-SHOP/BLDG MACHINERY	$630.92	$ -	$ -
4500068343	5/20/2025	MCI Carrillo Inc	Small Business	P210-NON-REV VEH REPAIRS	$96.98	$ -	$ -
4500068344	5/20/2025	Veterans Engineering Services, Inc.	Disabled Veteran Business	T110-TRACK, RAIL	$46,688.43	$ -	$ -
4500068345	5/21/2025	Transit Holdings Inc		B140-BUS CHASSIS	$82.23	$ -	$ -
4500068346	5/21/2025	Transit Holdings Inc		B140-BUS CHASSIS	$4.63	$ -	$ -
4500068347	5/21/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$1,566.86	$ -	$ -
4500068348	5/21/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$755.57	$ -	$ -
4500068349	5/21/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$1,131.89	$ -	$ -
4500068350	5/21/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$71.63	$ -	$ -
4500068351	5/21/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$72.73	$ -	$ -
4500068352	5/21/2025	Transit Holdings Inc		B140-BUS CHASSIS	$586.12	$ -	$ -
4500068353	5/21/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$1,406.41	$ -	$ -
4500068354	5/21/2025	Prochem Specialty Products Inc	Small Business	G180-JANITORIAL SUPPLIES	$1,397.41	$ -	$ -
4500068355	5/21/2025	Gillig LLC		B250-BUS REPAIR PARTS	$3,940.09	$ -	$ -
4500068356	5/21/2025	Init Innovations in Transportation		G290-FARE REVENUE EQUIP	$4,512.61	$ -	$ -
4500068357	5/21/2025	Cummins Inc		B250-BUS REPAIR PARTS	$8,689.95	$ -	$ -
4500068358	5/21/2025	Waxie's Enterprises, LLC		G140-SHOP SUPPLIES	$4,797.25	$ -	$ -
4500068359	5/21/2025	Gillig LLC		B250-BUS REPAIR PARTS	$209.08	$ -	$ -
4500068360	5/21/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$691.88	$ -	$ -
4500068361	5/21/2025	Norman Industrial Materials Inc.		B250-BUS REPAIR PARTS	$343.27	$ -	$ -
4500068362	5/21/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$124.39	$ -	$ -
4500068363	5/21/2025	Mcmaster-Carr Supply Co		B250-BUS REPAIR PARTS	$58.89	$ -	$ -
4500068364	5/21/2025	Genuine Parts Company Inc		B250-BUS REPAIR PARTS	$56.79	$ -	$ -
4500068365	5/21/2025	AirSuppply Tools, LLC		G180-JANITORIAL SUPPLIES	$411.98	$ -	$ -
4500068366	5/21/2025	Home Depot USA Inc		G140-SHOP SUPPLIES	$608.08	$ -	$ -
4500068367	5/21/2025	Network Industries, Inc.		P130-EQUIP MAINT REPR SVC	$999.36	$ -	$ -
4500068368	5/21/2025	Daniels Tire Service, Inc		A110-AUTO/TRUCK TIRES	$223.94	$ -	$ -
4500068369	5/21/2025	Airgas Inc		G190-SAFETY/MED SUPPLIES	$1,963.90	$ -	$ -
4500068370	5/21/2025	AirSuppply Tools, LLC		G140-SHOP SUPPLIES	$21.87	$ -	$ -
4500068371	5/21/2025	Allied Refrigeration Inc		G170-LUBRICANTS	$68.96	$ -	$ -
4500068372	5/21/2025	Applied Industrial		G140-SHOP SUPPLIES	$2,087.83	$ -	$ -
4500068373	5/21/2025	Aztec Fire & Safety, Inc.		G190-SAFETY/MED SUPPLIES	$456.86	$ -	$ -
4500068374	5/21/2025	B Hepworth & Co LTD of CT		R120-RAIL/LRV CAR BODY	$2,139.92	$ -	$ -
4500068375	5/21/2025	Clarran Inc.	DBE	G150-FASTENERS	$277.08	$ -	$ -
4500068376	5/21/2025	Brady Industries of California, LLC		G140-SHOP SUPPLIES	$1,460.82	$ -	$ -
4500068377	5/21/2025	Charter Industrial Supply Inc	Small Business	G140-SHOP SUPPLIES	$22.87	$ -	$ -
4500068378	5/22/2025	Transit Holdings Inc		B140-BUS CHASSIS	$939.49	$ -	$ -
4500068379	5/22/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$5,722.98	$ -	$ -
4500068380	5/22/2025	Transit Holdings Inc		B140-BUS CHASSIS	$3,865.48	$ -	$ -
4500068381	5/22/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$3,605.30	$ -	$ -
4500068382	5/22/2025	Dimensional Silk Screen Inc		G230-PRINTED MATERIALS	$2,133.45	$ -	$ -
4500068383	5/22/2025	Neyenesch Printers Inc	Small Business	G230-PRINTED MATERIALS	$3,288.83	$ -	$ -
4500068384	5/22/2025	San Diego East County		G260-MEDIA	$250.00	$ -	$ -
4500068385	5/22/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$1,556.39	$ -	$ -
4500068386	5/22/2025	Don Oleson Inc	Small Business	G140-SHOP SUPPLIES	$284.46	$ -	$ -
4500068387	5/22/2025	Fastenal Company		R230-RAIL/LRV MECHANICAL	$4,706.52	$ -	$ -
4500068388	5/22/2025	Flyers Energy LLC		G170-LUBRICANTS	$9,213.22	$ -	$ -
4500068389	5/22/2025	Gillig LLC		B130-BUS BODY	$11,817.75	$ -	$ -
4500068390	5/22/2025	Romaine Electric Corporation		M130-CROSSING MECHANISM	$1,501.09	$ -	$ -
4500068391	5/22/2025	Home Depot USA Inc		G160-PAINTS & CHEMICALS	$459.29	$ -	$ -
4500068392	5/22/2025	IPD Packaging		G140-SHOP SUPPLIES	$1,523.40	$ -	$ -
4500068393	5/22/2025	Jamison Professional Services, LLC	DBE	G170-LUBRICANTS	$1,744.78	$ -	$ -
4500068394	5/22/2025	Kurt Morgan		G200-OFFICE SUPPLIES	$1,317.65	$ -	$ -
4500068395	5/22/2025	Lisa Ynez Beetson	Minority Owned Business	G200-OFFICE SUPPLIES	$91.59	$ -	$ -
4500068396	5/22/2025	David Corbin		P440-CATERING SERVICES	$284.22	$ -	$ -
4500068397	5/22/2025	Luminator Technology Group Global		R120-RAIL/LRV CAR BODY	$3,483.04	$ -	$ -
4500068398	5/22/2025	Midwest Bus Corporation		B130-BUS BODY	$1,282.98	$ -	$ -
4500068399	5/22/2025	Mohawk Mfg & Supply Co		B140-BUS CHASSIS	$1,463.46	$ -	$ -
4500068400	5/22/2025	Motion Industries, Inc.		G140-SHOP SUPPLIES	$73.52	$ -	$ -
4500068401	5/22/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$2,614.99	$ -	$ -
4500068402	5/22/2025	Muncie Reclamation and Supply Co		B130-BUS BODY	$3,255.06	$ -	$ -
4500068403	5/22/2025	Neopart Transit LLC		B140-BUS CHASSIS	$668.44	$ -	$ -
4500068404	5/22/2025	OneSource Distributors, LLC		G180-JANITORIAL SUPPLIES	$115.07	$ -	$ -
4500068405	5/22/2025	Professional Contractors Supplies		G140-SHOP SUPPLIES	$690.40	$ -	$ -
4500068406	5/22/2025	Prudential Overall Supply		G140-SHOP SUPPLIES	$106.02	$ -	$ -
4500068407	5/22/2025	R.S. Hughes Co Inc		G140-SHOP SUPPLIES	$4,343.70	$ -	$ -
4500068408	5/22/2025	Reid and Clark Screen Arts Co		R130-RAIL/LRV COUPLER	$307.09	$ -	$ -
4500068409	5/22/2025	RJ International LLC	DBE	G140-SHOP SUPPLIES	$775.80	$ -	$ -
4500068410	5/22/2025	Questivity Inc.	DBE	I130-IT CAPITAL HARDWARE	$3,601.01	$ -	$ -
4500068411	5/22/2025	San Diego Friction Products, Inc.		B250-BUS REPAIR PARTS	$555.29	$ -	$ -
4500068412	5/23/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$363.82	$ -	$ -
4500068413	5/23/2025	Transit Holdings Inc		G140-SHOP SUPPLIES	$421.18	$ -	$ -
4500068414	5/23/2025	Muncie Reclamation and Supply Co		B200-BUS PWR TRAIN EQUIP	$107.16	$ -	$ -
4500068415	5/23/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$1,308.25	$ -	$ -
4500068416	5/23/2025	Amazon.com Sales, Inc.		P280-GENERAL SVC AGRMNTS	$40.91	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068417	5/23/2025	Hanning & Kahl LP		M140-WAYSIDE SIGNALS	$3,705.81	$ -	$ -
4500068418	5/23/2025	Daniels Tire Service, Inc		B210-BUS TIRES & TUBES	$532.55	$ -	$ -
4500068419	5/23/2025	Daniels Tire Service, Inc		B210-BUS TIRES & TUBES	$113.21	$ -	$ -
4500068420	5/23/2025	Daniels Tire Service, Inc		B210-BUS TIRES & TUBES	$161.44	$ -	$ -
4500068421	5/23/2025	Ferguson Enterprises, LLC		F190-LANDSCAPING MAT'LS	$483.96	$ -	$ -
4500068422	5/23/2025	Continental Locks		F180-BUILDING MATERIALS	$105.00	$ -	$ -
4500068424	5/23/2025	The Gordian Group, Inc.		T110-TRACK, RAIL	$16,926.70	$ -	$ -
4500068425	5/23/2025	Saitech Inc	Minority Owned Business	I110-INFORMATION TECH	$143,736.00	$ -	$ -
4500068426	5/23/2025	OneSource Distributors, LLC		P130-EQUIP MAINT REPR SVC	$743.89	$ -	$ -
4500068428	5/23/2025	Transit Holdings Inc		B130-BUS BODY	$1,350.67	$ -	$ -
4500068429	5/23/2025	Fastenal Company		G140-SHOP SUPPLIES	$4,537.92	$ -	$ -
4500068430	5/23/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$3,251.09	$ -	$ -
4500068431	5/23/2025	Governmentjobs.com, Inc		P450-PERSONNEL SVCS	$4,994.94	$ -	$ -
4500068432	5/23/2025	Clarran Inc.	DBE	G150-FASTENERS	$369.42	$ -	$ -
4500068433	5/23/2025	DocuSign, Inc.		P450-PERSONNEL SVCS	$5,000.00	$ -	$ -
4500068434	5/27/2025	Transit Holdings Inc		B140-BUS CHASSIS	$771.87	$ -	$ -
4500068435	5/27/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$2,279.86	$ -	$ -
4500068436	5/27/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$139.65	$ -	$ -
4500068437	5/27/2025	Init Innovations in Transportation		G290-FARE REVENUE EQUIP	$375.00	$ -	$ -
4500068438	5/27/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$685.29	$ -	$ -
4500068439	5/27/2025	Transit Holdings Inc		B140-BUS CHASSIS	$2,966.12	$ -	$ -
4500068440	5/27/2025	Signal Hill Auto Enterprises, Inc.		G180-JANITORIAL SUPPLIES	$203.65	$ -	$ -
4500068441	5/27/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,906.98	$ -	$ -
4500068442	5/27/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$1,914.00	$ -	$ -
4500068443	5/27/2025	Conduent Transport Solutions, Inc.		B150-BUS COMM EQUIP.	$112,808.80	$ -	$ -
4500068444	5/27/2025	Louis Sardo Upholstery Inc		B130-BUS BODY	$2,198.11	$ -	$ -
4500068445	5/27/2025	Uline Inc		G140-SHOP SUPPLIES	$1,107.82	$ -	$ -
4500068446	5/27/2025	San Diego Friction Products, Inc.		G140-SHOP SUPPLIES	$3,452.03	$ -	$ -
4500068447	5/27/2025	Staples Contract & Commercial LLC		G200-OFFICE SUPPLIES	$1,052.58	$ -	$ -
4500068448	5/27/2025	The Sherwin-Williams Company		F120-BUS/LRV PAINT BOOTHS	$563.97	$ -	$ -
4500068449	5/27/2025	Supreme Oil Co.		A120-AUTO/TRUCK GASOLINE	$9,694.46	$ -	$ -
4500068450	5/27/2025	Siemens Mobility, Inc.		M140-WAYSIDE SIGNALS	$2,751.94	$ -	$ -
4500068451	5/27/2025	Gillig LLC		B250-BUS REPAIR PARTS	$19,382.73	$ -	$ -
4500068452	5/27/2025	Waytek Inc		G140-SHOP SUPPLIES	$84.77	$ -	$ -
4500068453	5/27/2025	Gillig LLC		B130-BUS BODY	$4,809.70	$ -	$ -
4500068454	5/27/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$3,039.35	$ -	$ -
4500068455	5/27/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$8,613.90	$ -	$ -
4500068456	5/27/2025	Muncie Reclamation and Supply Co		B130-BUS BODY	$226.10	$ -	$ -
4500068457	5/27/2025	AirSuppply Tools, LLC		G140-SHOP SUPPLIES	$118.35	$ -	$ -
4500068458	5/27/2025	Air & Lube Systems Inc	DBE	F110-SHOP/BLDG MACHINERY	$821.83	$ -	$ -
4500068459	5/27/2025	Crane Payment Innovations Inc		G290-FARE REVENUE EQUIP	$1,518.93	$ -	$ -
4500068460	5/27/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$116.40	$ -	$ -
4500068461	5/27/2025	Dellner Inc		R130-RAIL/LRV COUPLER	$91,366.50	$ -	$ -
4500068462	5/27/2025	ON-LINE STAMPCO INC	Small Business	G200-OFFICE SUPPLIES	$43.46	$ -	$ -
4500068463	5/27/2025	San Diego Friction Products, Inc.		B120-BUS MECHANICAL PARTS	$202.68	$ -	$ -
4500068464	5/27/2025	Uline Inc		P280-GENERAL SVC AGRMNTS	$201.95	$ -	$ -
4500068465	5/27/2025	ODP Business Solutions, LLC		P280-GENERAL SVC AGRMNTS	$336.07	$ -	$ -
4500068466	5/27/2025	W.W. Grainger Inc		F110-SHOP/BLDG MACHINERY	$476.22	$ -	$ -
4500068467	5/28/2025	Muncie Reclamation and Supply Co		B200-BUS PWR TRAIN EQUIP	$77.75	$ -	$ -
4500068468	5/28/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$3,541.09	$ -	$ -
4500068469	5/28/2025	Transit Holdings Inc		B130-BUS BODY	$179.89	$ -	$ -
4500068470	5/28/2025	Transit Holdings Inc		B130-BUS BODY	$217.14	$ -	$ -
4500068471	5/28/2025	Interboro Packaging Corporation		G180-JANITORIAL SUPPLIES	$135.44	$ -	$ -
4500068472	5/28/2025	Transit Holdings Inc		B130-BUS BODY	$3.01	$ -	$ -
4500068473	5/28/2025	Cummins Inc		B120-BUS MECHANICAL PARTS	$175.85	$ -	$ -
4500068474	5/28/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$1,855.51	$ -	$ -
4500068475	5/28/2025	Muncie Reclamation and Supply Co		B200-BUS PWR TRAIN EQUIP	$10.67	$ -	$ -
4500068476	5/28/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$279.02	$ -	$ -
4500068477	5/28/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$3,161.54	$ -	$ -
4500068478	5/28/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$6,220.84	$ -	$ -
4500068479	5/28/2025	Parts Authority, LLC		B160-BUS ELECTRICAL	$10,807.70	$ -	$ -
4500068480	5/28/2025	B and H Photo and Electronics		B150-BUS COMM EQUIP.	$1,572.94	$ -	$ -
4500068481	5/28/2025	Init Innovations in Transportation		P130-EQUIP MAINT REPR SVC	$134.69	$ -	$ -
4500068482	5/28/2025	Louis Sardo Upholstery Inc		B130-BUS BODY	$2,198.11	$ -	$ -
4500068483	5/28/2025	W.W. Grainger Inc		B160-BUS ELECTRICAL	$2,107.96	$ -	$ -
4500068484	5/28/2025	Harbor Diesel & Equipment, Inc		B250-BUS REPAIR PARTS	$19,281.96	$ -	$ -
4500068485	5/28/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$18,864.08	$ -	$ -
4500068486	5/28/2025	Home Depot USA Inc		F110-SHOP/BLDG MACHINERY	$325.82	$ -	$ -
4500068487	5/28/2025	Gillig LLC		B130-BUS BODY	$2,206.24	$ -	$ -
4500068488	5/28/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$10,523.32	$ -	$ -
4500068489	5/28/2025	Gillig LLC		B130-BUS BODY	$3,073.80	$ -	$ -
4500068491	5/28/2025	Transit Holdings Inc		B130-BUS BODY	$6,283.55	$ -	$ -
4500068492	5/28/2025	Clarran Inc.	DBE	G150-FASTENERS	$181.64	$ -	$ -
4500068493	5/28/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$1,030.68	$ -	$ -
4500068494	5/29/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$516.62	$ -	$ -
4500068495	5/29/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$280.56	$ -	$ -
4500068496	5/29/2025	Transit Holdings Inc		B130-BUS BODY	$2,137.97	$ -	$ -
4500068497	5/29/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,058.04	$ -	$ -
4500068498	5/29/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$71.63	$ -	$ -
4500068499	5/29/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$960.62	$ -	$ -
4500068500	5/29/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$422.69	$ -	$ -
4500068502	5/29/2025	Home Depot USA Inc		G130-SHOP TOOLS	$321.10	$ -	$ -
4500068503	5/29/2025	Neyenesch Printers Inc	Small Business	G230-PRINTED MATERIALS	$3,590.22	$ -	$ -
4500068504	5/29/2025	VCA Animal Hospitals, Inc.		G120-SECURITY	$169.60	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068505	5/29/2025	RJ International LLC	DBE	G190-SAFETY/MED SUPPLIES	$618.19	$ -	$ -
4500068506	5/29/2025	Willy's Electronic Supply Co Inc		G140-SHOP SUPPLIES	$402.78	$ -	$ -
4500068507	5/29/2025	Freeby Signs		B130-BUS BODY	$364.76	$ -	$ -
4500068508	5/29/2025	Jamison Professional Services, LLC	DBE	G170-LUBRICANTS	$1,847.18	$ -	$ -
4500068509	5/29/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$289.25	$ -	$ -
4500068510	5/29/2025	Waxie's Enterprises, LLC		G140-SHOP SUPPLIES	$460.69	$ -	$ -
4500068511	5/29/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$287.83	$ -	$ -
4500068512	5/29/2025	Schuko LLC		G260-MEDIA	$756.33	$ -	$ -
4500068513	5/29/2025	Prochem Specialty Products Inc	Small Business	G180-JANITORIAL SUPPLIES	$931.60	$ -	$ -
4500068514	5/29/2025	Fossil Industries, Inc.		G230-PRINTED MATERIALS	$3,562.00	$ -	$ -
4500068515	5/29/2025	TK Services Inc		B250-BUS REPAIR PARTS	$1,728.11	$ -	$ -
4500068516	5/29/2025	Gillig LLC		B250-BUS REPAIR PARTS	$3,093.83	$ -	$ -
4500068517	5/29/2025	Compressed Air Systems		F110-SHOP/BLDG MACHINERY	$826.45	$ -	$ -
4500068518	5/29/2025	Fastenal Company		G140-SHOP SUPPLIES	$1,537.81	$ -	$ -
4500068519	5/29/2025	Airgas Inc		G140-SHOP SUPPLIES	$443.66	$ -	$ -
4500068520	5/29/2025	Siemens Mobility, Inc.		R230-RAIL/LRV MECHANICAL	$3,905.09	$ -	$ -
4500068521	5/29/2025	Waxie's Enterprises, LLC		G140-SHOP SUPPLIES	$3,401.67	$ -	$ -
4500068522	5/29/2025	Ace Uniforms LLC	Small Business	P330-UNIFORM RENT/CLEAN	$4,747.99	$ -	$ -
4500068523	5/29/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$1,423.36	$ -	$ -
4500068524	5/29/2025	Magaldi & Magaldi Inc		B250-BUS REPAIR PARTS	$636.31	$ -	$ -
4500068525	5/29/2025	Home Depot USA Inc		F180-BUILDING MATERIALS	$401.47	$ -	$ -
4500068526	5/29/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$2,067.35	$ -	$ -
4500068527	5/29/2025	San Diego Friction Products, Inc.		B250-BUS REPAIR PARTS	$4,538.70	$ -	$ -
4500068528	5/29/2025	Fastenal Company		G140-SHOP SUPPLIES	$4,034.16	$ -	$ -
4500068529	5/30/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$3,439.00	$ -	$ -
4500068530	5/30/2025	Transit Holdings Inc		B130-BUS BODY	$270.69	$ -	$ -
4500068531	5/30/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$4,018.38	$ -	$ -
4500068532	5/30/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$3,711.00	$ -	$ -
4500068533	5/30/2025	Mohawk Mfg & Supply Co		B140-BUS CHASSIS	$34.30	$ -	$ -
4500068534	5/30/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$13.19	$ -	$ -
4500068535	5/30/2025	Transit Holdings Inc		B140-BUS CHASSIS	$2,461.14	$ -	$ -
4500068536	5/30/2025	Transit Holdings Inc		B140-BUS CHASSIS	$1,232.96	$ -	$ -
4500068537	5/30/2025	Senales, Inc.		G230-PRINTED MATERIALS	$260.76	$ -	$ -
4500068538	5/30/2025	Don Oleson Inc	Small Business	B120-BUS MECHANICAL PARTS	$3,216.82	$ -	$ -
4500068539	5/30/2025	Uline Inc		G200-OFFICE SUPPLIES	$577.54	$ -	$ -
4500068540	5/30/2025	Gillig LLC		B130-BUS BODY	$4,213.20	$ -	$ -
4500068541	5/30/2025	San Diego Friction Products, Inc.		G140-SHOP SUPPLIES	$830.76	$ -	$ -
4500068542	5/30/2025	W.W. Grainger Inc		M140-WAYSIDE SIGNALS	$967.28	$ -	$ -
4500068543	5/30/2025	Home Depot USA Inc		G130-SHOP TOOLS	$242.12	$ -	$ -
4500068544	5/30/2025	Network Industries, Inc.		F110-SHOP/BLDG MACHINERY	$225.87	$ -	$ -
4500068545	5/30/2025	Network Industries, Inc.		F110-SHOP/BLDG MACHINERY	$366.01	$ -	$ -
4500068546	5/30/2025	Shilpark Paint Corporation		G160-PAINTS & CHEMICALS	$863.92	$ -	$ -
4500068547	5/30/2025	Tennant Sales & Serv Co		F110-SHOP/BLDG MACHINERY	$145.23	$ -	$ -
4500068548	5/30/2025	Shilpark Paint Corporation		F180-BUILDING MATERIALS	$640.33	$ -	$ -
4500068549	5/30/2025	Daniels Tire Service, Inc		A110-AUTO/TRUCK TIRES	$189.24	$ -	$ -
4500068550	5/30/2025	L&W Industries LLC		M140-WAYSIDE SIGNALS	$285.98	$ -	$ -
4500068551	5/30/2025	M Power Truck & Diesel		P210-NON-REV VEH REPAIRS	$2,298.82	$ -	$ -
4500068552	5/30/2025	TheNewPush LLC		I110-INFORMATION TECH	$33,713.68	$ -	$ -
4500068553	5/30/2025	Access Professional Inc.	Small Business	C120-SPECIALTY CONTRACTOR	$275.00	$ -	$ -
4500068554	5/30/2025	Network Industries, Inc.		F200-TANK EQUIPMENT	$1,133.54	$ -	$ -
4500068555	5/30/2025	M Power Truck & Diesel		P210-NON-REV VEH REPAIRS	$2,298.82	$ -	$ -
4500068557	5/30/2025	Gillig LLC		B130-BUS BODY	$1,915.02	$ -	$ -
4500068558	5/30/2025	B and H Photo and Electronics		B150-BUS COMM EQUIP.	$1,572.94	$ -	$ -
4500068560	5/30/2025	Element Materials Technology		G190-SAFETY/MED SUPPLIES	$4,715.00	$ -	$ -
4500068561	6/2/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$22.76	$ -	$ -
4500068562	6/2/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$348.85	$ -	$ -
4500068563	6/2/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$5,874.94	$ -	$ -
4500068564	6/2/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$474.71	$ -	$ -
4500068565	6/2/2025	Transit Holdings Inc		B140-BUS CHASSIS	$8,664.78	$ -	$ -
4500068566	6/2/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$601.15	$ -	$ -
4500068567	6/2/2025	AirSuppply Tools, LLC		G130-SHOP TOOLS	$14.23	$ -	$ -
4500068568	6/2/2025	AirSuppply Tools, LLC		G130-SHOP TOOLS	$309.53	$ -	$ -
4500068569	6/2/2025	AirSuppply Tools, LLC		G130-SHOP TOOLS	$43.63	$ -	$ -
4500068570	6/2/2025	Norman Industrial Materials Inc.		G140-SHOP SUPPLIES	$115.29	$ -	$ -
4500068571	6/2/2025	Supreme Oil Co.		A120-AUTO/TRUCK GASOLINE	$11,425.31	$ -	$ -
4500068572	6/2/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$2,940.71	$ -	$ -
4500068573	6/2/2025	Social Pinpoint Inc		P310-ADVERTISING SERVICES	$36,800.00	$ -	$ -
4500068574	6/2/2025	Seon Design (USA) Corp.		R150-RAIL/LRV COMM EQUIP	$50,874.34	$ -	$ -
4500068575	6/2/2025	San Diego Seal, Inc.	Small Business	G140-SHOP SUPPLIES	$711.77	$ -	$ -
4500068576	6/2/2025	Corodata Shredding, Inc.		S130-DISPOSAL, OTHER	$8,092.59	$ -	$ -
4500068577	6/2/2025	Nanov Display Inc.		I130-IT CAPITAL HARDWARE	$4,903.72	$ -	$ -
4500068578	6/2/2025	MCI Carrillo Inc	Small Business	B250-BUS REPAIR PARTS	$1,435.72	$ -	$ -
4500068579	6/2/2025	MCI Carrillo Inc	Small Business	B250-BUS REPAIR PARTS	$192.88	$ -	$ -
4500068580	6/2/2025	Clarran Inc.	DBE	G150-FASTENERS	$314.61	$ -	$ -
4500068581	6/2/2025	TK Services Inc		B250-BUS REPAIR PARTS	$919.98	$ -	$ -
4500068582	6/2/2025	Willy's Electronic Supply Co Inc		P210-NON-REV VEH REPAIRS	$75.45	$ -	$ -
4500068583	6/2/2025	Midwest Motor Supply Co. Inc		F180-BUILDING MATERIALS	$955.79	$ -	$ -
4500068584	6/2/2025	Midwest Motor Supply Co. Inc		G180-JANITORIAL SUPPLIES	$1,293.00	$ -	$ -
4500068585	6/2/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$5,054.45	$ -	$ -
4500068586	6/2/2025	Professional Contractors Supplies		G140-SHOP SUPPLIES	$580.70	$ -	$ -
4500068588	6/2/2025	Vern Rose Inc		G140-SHOP SUPPLIES	$89.15	$ -	$ -
4500068589	6/2/2025	Prudential Overall Supply		G140-SHOP SUPPLIES	$868.89	$ -	$ -
4500068590	6/2/2025	Mohawk Mfg & Supply Co		B160-BUS ELECTRICAL	$941.08	$ -	$ -
4500068591	6/2/2025	Init Innovations in Transportation		G290-FARE REVENUE EQUIP	$831.85	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068592	6/2/2025	Harbor Diesel & Equipment, Inc		B120-BUS MECHANICAL PARTS	$199.20	$ -	$ -
4500068593	6/2/2025	Cummins Inc		B250-BUS REPAIR PARTS	$226.58	$ -	$ -
4500068594	6/2/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$13,709.72	$ -	$ -
4500068595	6/2/2025	White Cap, LP		B250-BUS REPAIR PARTS	$562.43	$ -	$ -
4500068596	6/3/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$169.56	$ -	$ -
4500068597	6/3/2025	Transit Holdings Inc		B110-BUS HVAC SYSTEMS	$1,500.48	$ -	$ -
4500068598	6/3/2025	VGP Holdings LLC		B120-BUS MECHANICAL PARTS	$7,790.33	$ -	$ -
4500068599	6/3/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$1,372.30	$ -	$ -
4500068600	6/3/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$747.57	$ -	$ -
4500068601	6/3/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$104.19	$ -	$ -
4500068602	6/3/2025	Signal Hill Auto Enterprises, Inc.		G180-JANITORIAL SUPPLIES	$3,498.10	$ -	$ -
4500068603	6/3/2025	Gillig LLC		B250-BUS REPAIR PARTS	$256.77	$ -	$ -
4500068604	6/3/2025	NS Corporation		F110-SHOP/BLDG MACHINERY	$339.85	$ -	$ -
4500068605	6/3/2025	MCI Carrillo Inc	Small Business	B250-BUS REPAIR PARTS	$382.83	$ -	$ -
4500068606	6/3/2025	W.W. Grainger Inc		G130-SHOP TOOLS	$1,013.41	$ -	$ -
4500068607	6/3/2025	Uline Inc		F110-SHOP/BLDG MACHINERY	$202.78	$ -	$ -
4500068608	6/3/2025	Cummins Inc		B250-BUS REPAIR PARTS	$2,437.36	$ -	$ -
4500068609	6/3/2025	TK Services Inc		B250-BUS REPAIR PARTS	$3,337.02	$ -	$ -
4500068610	6/3/2025	Muncie Reclamation and Supply Co		B160-BUS ELECTRICAL	$127.04	$ -	$ -
4500068611	6/3/2025	Mohawk Mfg & Supply Co		B200-BUS PWR TRAIN EQUIP	$36.72	$ -	$ -
4500068612	6/3/2025	Network Industries, Inc.		F110-SHOP/BLDG MACHINERY	$559.99	$ -	$ -
4500068613	6/3/2025	Robcar Corporation	Woman Owned Business	G110-BUS/TROLLEY SIGNAGE	$91.59	$ -	$ -
4500068614	6/3/2025	Shilpark Paint Corporation		G160-PAINTS & CHEMICALS	$153.55	$ -	$ -
4500068615	6/3/2025	Sunbelt Rentals, Inc		P160-EQUIPMENT RENTALS	$3,951.86	$ -	$ -
4500068616	6/3/2025	San Diego Community		P540-MAINTENANCE TRAINING	$80.82	$ -	$ -
4500068617	6/3/2025	Inland Kenworth (US) Inc		B250-BUS REPAIR PARTS	$2,143.08	$ -	$ -
4500068618	6/3/2025	Continental Locks		P190-REV VEHICLE REPAIRS	$195.00	$ -	$ -
4500068619	6/3/2025	Abacor, Inc.	Small Business	P210-NON-REV VEH REPAIRS	$4,199.02	$ -	$ -
4500068620	6/3/2025	American Battery Corporation	Small Business	T120-TRACK, LUBRICATORS	$507.20	$ -	$ -
4500068621	6/3/2025	San Diego Compressed Air Power LLC		F110-SHOP/BLDG MACHINERY	$703.66	$ -	$ -
4500068622	6/3/2025	Shilpark Paint Corporation		F190-LANDSCAPING MAT'LS	$179.48	$ -	$ -
4500068623	6/3/2025	Clarran Inc.	DBE	G150-FASTENERS	$39.44	$ -	$ -
4500068624	6/3/2025	Transit Holdings Inc		B140-BUS CHASSIS	$4,847.02	$ -	$ -
4500068625	6/3/2025	R.S. Hughes Co Inc		G190-SAFETY/MED SUPPLIES	$1,196.63	$ -	$ -
4500068626	6/3/2025	Genfare, LLC		B250-BUS REPAIR PARTS	$3,680.24	$ -	$ -
4500068627	6/3/2025	Gillig LLC		B250-BUS REPAIR PARTS	$451.72	$ -	$ -
4500068628	6/3/2025	AirSuppply Tools, LLC		G200-OFFICE SUPPLIES	$65.78	$ -	$ -
4500068629	6/3/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$3,210.48	$ -	$ -
4500068630	6/3/2025	Marvco Enterprises Inc		G200-OFFICE SUPPLIES	$673.97	$ -	$ -
4500068631	6/3/2025	Veterans Engineering Services, Inc.	Disabled Veteran Business	T110-TRACK, RAIL	$144,856.21	$ -	$ -
4500068632	6/3/2025	E W Truck & Equipment Co Inc		B140-BUS CHASSIS	$224.12	$ -	$ -
4500068633	6/3/2025	The Gordian Group, Inc.		T110-TRACK, RAIL	$2,549.47	$ -	$ -
4500068634	6/3/2025	Init Innovations in Transportation		G290-FARE REVENUE EQUIP	$831.85	$ -	$ -
4500068635	6/3/2025	Trolley Support LLC		B130-BUS BODY	$2,316.63	$ -	$ -
4500068637	6/4/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$305.15	$ -	$ -
4500068638	6/4/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$634.43	$ -	$ -
4500068639	6/4/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$462.05	$ -	$ -
4500068640	6/4/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$655.30	$ -	$ -
4500068641	6/4/2025	Pacific Star Corporation		G180-JANITORIAL SUPPLIES	$58.46	$ -	$ -
4500068642	6/4/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$1,210.23	$ -	$ -
4500068643	6/4/2025	Transit Holdings Inc		B130-BUS BODY	$8,155.02	$ -	$ -
4500068644	6/4/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$2,965.37	$ -	$ -
4500068645	6/4/2025	AirSuppply Tools, LLC		G160-PAINTS & CHEMICALS	$22.13	$ -	$ -
4500068646	6/4/2025	Shilpark Paint Corporation		F180-BUILDING MATERIALS	$83.30	$ -	$ -
4500068647	6/4/2025	AirSuppply Tools, LLC		G130-SHOP TOOLS	$124.22	$ -	$ -
4500068648	6/4/2025	AirSuppply Tools, LLC		G150-FASTENERS	$32.30	$ -	$ -
4500068649	6/4/2025	AirSuppply Tools, LLC		G140-SHOP SUPPLIES	$307.74	$ -	$ -
4500068650	6/4/2025	AirSuppply Tools, LLC		G140-SHOP SUPPLIES	$135.35	$ -	$ -
4500068651	6/4/2025	Winzer Franchise Company		G150-FASTENERS	$825.96	$ -	$ -
4500068652	6/5/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$915.45	$ -	$ -
4500068653	6/5/2025	Custom Glass Solutions Fostoria LLC		R120-RAIL/LRV CAR BODY	$40,526.93	$ -	$ -
4500068654	6/5/2025	Custom Glass Solutions Fostoria LLC		R120-RAIL/LRV CAR BODY	$40,526.93	$ -	$ -
4500068655	6/5/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$24.11	$ -	$ -
4500068656	6/5/2025	Norman Industrial Materials Inc.		G140-SHOP SUPPLIES	$1,884.49	$ -	$ -
4500068657	6/5/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$45.30	$ -	$ -
4500068658	6/5/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$254.68	$ -	$ -
4500068659	6/5/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$1,491.22	$ -	$ -
4500068660	6/5/2025	OneSource Distributors, LLC		M120-OVRHEAD CATENARY SYS	$124.35	$ -	$ -
4500068661	6/5/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,540.69	$ -	$ -
4500068662	6/5/2025	Transit Holdings Inc		B130-BUS BODY	$444.27	$ -	$ -
4500068664	6/5/2025	OneSource Distributors, LLC		G130-SHOP TOOLS	$4,773.52	$ -	$ -
4500068665	6/5/2025	Alliant Insurance Services, Inc.		P380-WORKERS' COMP	$17,441.00	$ -	$ -
4500068666	6/5/2025	Transit Holdings Inc		B130-BUS BODY	$3,140.45	$ -	$ -
4500068667	6/5/2025	Gillig LLC		B140-BUS CHASSIS	$3,058.87	$ -	$ -
4500068668	6/5/2025	Muncie Reclamation and Supply Co		B200-BUS PWR TRAIN EQUIP	$10,407.13	$ -	$ -
4500068669	6/5/2025	Questivity Inc.	DBE	I110-INFORMATION TECH	$75,720.00	$ -	$ -
4500068670	6/5/2025	Mohawk Mfg & Supply Co		B140-BUS CHASSIS	$1,120.53	$ -	$ -
4500068671	6/5/2025	Neopart Transit LLC		B140-BUS CHASSIS	$2,419.31	$ -	$ -
4500068672	6/5/2025	Transit Holdings Inc		B140-BUS CHASSIS	$2,313.38	$ -	$ -
4500068673	6/5/2025	Don Oleson Inc	Small Business	B120-BUS MECHANICAL PARTS	$3,324.57	$ -	$ -
4500068674	6/5/2025	Don Oleson Inc	Small Business	B120-BUS MECHANICAL PARTS	$3,324.57	$ -	$ -
4500068675	6/5/2025	ODP Business Solutions, LLC		P280-GENERAL SVC AGRMNTS	$136.99	$ -	$ -
4500068676	6/5/2025	Environmental Laboratory Network	Small Business	F110-SHOP/BLDG MACHINERY	$484.88	$ -	$ -
4500068677	6/5/2025	Home Depot USA Inc		F110-SHOP/BLDG MACHINERY	$133.87	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068678	6/5/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$141.16	$ -	$ -
4500068679	6/5/2025	MCI Carrillo Inc	Small Business	B250-BUS REPAIR PARTS	$292.32	$ -	$ -
4500068680	6/5/2025	Cummins Inc		B250-BUS REPAIR PARTS	$80.04	$ -	$ -
4500068681	6/5/2025	Trentman Corp	Small Business	P280-GENERAL SVC AGRMNTS	$115.13	$ -	$ -
4500068682	6/5/2025	RJ International LLC	DBE	G190-SAFETY/MED SUPPLIES	$494.58	$ -	$ -
4500068683	6/5/2025	Home Depot USA Inc		F110-SHOP/BLDG MACHINERY	$260.54	$ -	$ -
4500068684	6/5/2025	South Bay Fence Inc	Small Business	F110-SHOP/BLDG MACHINERY	$182.69	$ -	$ -
4500068685	6/5/2025	Staples Contract & Commercial LLC		G200-OFFICE SUPPLIES	$30.40	$ -	$ -
4500068686	6/5/2025	Wabtec Transportation Systems, LLC		M150-PWR SWITCHES/LOCKS	$193.95	$ -	$ -
4500068687	6/5/2025	Charter Industrial Supply Inc	Small Business	F110-SHOP/BLDG MACHINERY	$604.48	$ -	$ -
4500068688	6/5/2025	OneSource Distributors, LLC		G130-SHOP TOOLS	$3,826.18	$ -	$ -
4500068689	6/5/2025	Home Depot USA Inc		G130-SHOP TOOLS	$891.85	$ -	$ -
4500068690	6/6/2025	Transit Holdings Inc		B130-BUS BODY	$181.11	$ -	$ -
4500068691	6/6/2025	Muncie Reclamation and Supply Co		B200-BUS PWR TRAIN EQUIP	$214.31	$ -	$ -
4500068692	6/6/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$1,546.23	$ -	$ -
4500068693	6/6/2025	Mohawk Mfg & Supply Co		B140-BUS CHASSIS	$34.30	$ -	$ -
4500068694	6/6/2025	Transit Holdings Inc		B140-BUS CHASSIS	$3,384.51	$ -	$ -
4500068695	6/6/2025	ColorID LLC	Small Business	G200-OFFICE SUPPLIES	$714.39	$ -	$ -
4500068696	6/6/2025	Data Controls Printworks, Inc.	Small Business	G230-PRINTED MATERIALS	$404.07	$ -	$ -
4500068697	6/6/2025	Steven R Timme		G230-PRINTED MATERIALS	$2,949.25	$ -	$ -
4500068698	6/6/2025	Amazon.com Sales, Inc.		G200-OFFICE SUPPLIES	$46.30	$ -	$ -
4500068700	6/6/2025	Team One Repair Inc		G290-FARE REVENUE EQUIP	$22,891.09	$ -	$ -
4500068701	6/6/2025	Transit Innovations LLC		M120-OVRHEAD CATENARY SYS	$1,777.88	$ -	$ -
4500068702	6/6/2025	Winzer Franchise Company		R160-RAIL/LRV ELECTRICAL	$732.70	$ -	$ -
4500068703	6/9/2025	Mohawk Mfg & Supply Co		B140-BUS CHASSIS	$137.19	$ -	$ -
4500068704	6/9/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$3,091.22	$ -	$ -
4500068705	6/9/2025	Muncie Reclamation and Supply Co		B200-BUS PWR TRAIN EQUIP	$8.19	$ -	$ -
4500068706	6/9/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$16.00	$ -	$ -
4500068707	6/9/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$3,280.78	$ -	$ -
4500068708	6/9/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$667.01	$ -	$ -
4500068709	6/9/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$154.51	$ -	$ -
4500068710	6/9/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$2,716.40	$ -	$ -
4500068711	6/9/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$5,841.30	$ -	$ -
4500068712	6/9/2025	VGP Holdings LLC		B120-BUS MECHANICAL PARTS	$5,193.55	$ -	$ -
4500068713	6/9/2025	Virginia Electronic & Lighting LLC		M140-WAYSIDE SIGNALS	$2,020.32	$ -	$ -
4500068714	6/9/2025	Winzer Franchise Company		G130-SHOP TOOLS	$115.20	$ -	$ -
4500068715	6/9/2025	Wesco Distribution Inc		F110-SHOP/BLDG MACHINERY	$1,126.53	$ -	$ -
4500068716	6/9/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$745.39	$ -	$ -
4500068717	6/9/2025	Don Oleson Inc	Small Business	B120-BUS MECHANICAL PARTS	$3,324.57	$ -	$ -
4500068718	6/9/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$1,595.15	$ -	$ -
4500068719	6/9/2025	Staples Contract & Commercial LLC		G200-OFFICE SUPPLIES	$45.58	$ -	$ -
4500068720	6/9/2025	Harbor Diesel & Equipment, Inc		B200-BUS PWR TRAIN EQUIP	$22,648.96	$ -	$ -
4500068721	6/9/2025	Airgas Inc		G190-SAFETY/MED SUPPLIES	$122.84	$ -	$ -
4500068722	6/9/2025	Allied Refrigeration Inc		G170-LUBRICANTS	$206.88	$ -	$ -
4500068723	6/9/2025	Brady Industries of California, LLC		G180-JANITORIAL SUPPLIES	$135.54	$ -	$ -
4500068724	6/9/2025	San Diego Friction Products, Inc.		B140-BUS CHASSIS	$259.97	$ -	$ -
4500068725	6/9/2025	Clarran Inc.	DBE	G150-FASTENERS	$364.56	$ -	$ -
4500068726	6/9/2025	Southern Counties Lubricants LLC		G170-LUBRICANTS	$1,418.74	$ -	$ -
4500068727	6/9/2025	Supreme Oil Co.		A120-AUTO/TRUCK GASOLINE	$11,490.04	$ -	$ -
4500068728	6/9/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$2,953.04	$ -	$ -
4500068729	6/9/2025	Muncie Reclamation and Supply Co		B130-BUS BODY	$1,724.00	$ -	$ -
4500068730	6/9/2025	Transit Holdings Inc		B130-BUS BODY	$1,857.34	$ -	$ -
4500068731	6/9/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$231.88	$ -	$ -
4500068732	6/9/2025	Muncie Reclamation and Supply Co		B160-BUS ELECTRICAL	$581.26	$ -	$ -
4500068733	6/9/2025	Freeby Signs		B130-BUS BODY	$310.11	$ -	$ -
4500068734	6/9/2025	Cummins Inc		B250-BUS REPAIR PARTS	$3,776.58	$ -	$ -
4500068736	6/9/2025	Clarran Inc.	DBE	G150-FASTENERS	$599.39	$ -	$ -
4500068737	6/9/2025	Init Innovations in Transportation		G290-FARE REVENUE EQUIP	$4,749.09	$ -	$ -
4500068738	6/9/2025	All The King's Flags		M200-YARD FACILITIES	$969.75	$ -	$ -
4500068739	6/9/2025	Midwest Bus Corporation		B130-BUS BODY	$1,523.84	$ -	$ -
4500068740	6/9/2025	Charter Industrial Supply Inc	Small Business	B120-BUS MECHANICAL PARTS	$830.60	$ -	$ -
4500068741	6/9/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$1,428.78	$ -	$ -
4500068742	6/9/2025	The Sherwin-Williams Company		G160-PAINTS & CHEMICALS	$1,595.84	$ -	$ -
4500068743	6/9/2025	RJ International LLC	DBE	G140-SHOP SUPPLIES	$1,608.18	$ -	$ -
4500068744	6/9/2025	Southern Counties Lubricants LLC		G170-LUBRICANTS	$3,351.29	$ -	$ -
4500068745	6/9/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$1,793.70	$ -	$ -
4500068746	6/9/2025	Gillig LLC		B130-BUS BODY	$4,119.15	$ -	$ -
4500068747	6/9/2025	Staples Contract & Commercial LLC		G200-OFFICE SUPPLIES	$624.53	$ -	$ -
4500068748	6/9/2025	Fastenal Company		G150-FASTENERS	$525.50	$ -	$ -
4500068749	6/9/2025	Prochem Specialty Products Inc	Small Business	G180-JANITORIAL SUPPLIES	$3,260.63	$ -	$ -
4500068750	6/9/2025	Professional Contractors Supplies		G160-PAINTS & CHEMICALS	$33.95	$ -	$ -
4500068751	6/9/2025	Reid and Clark Screen Arts Co		R120-RAIL/LRV CAR BODY	$463.33	$ -	$ -
4500068752	6/9/2025	Kurt Morgan		G200-OFFICE SUPPLIES	$1,702.58	$ -	$ -
4500068753	6/9/2025	Motion Industries, Inc.		B250-BUS REPAIR PARTS	$727.42	$ -	$ -
4500068754	6/9/2025	Mcmaster-Carr Supply Co		G140-SHOP SUPPLIES	$97.10	$ -	$ -
4500068755	6/10/2025	Signal Hill Auto Enterprises, Inc.		G180-JANITORIAL SUPPLIES	$668.05	$ -	$ -
4500068756	6/10/2025	Transit Holdings Inc		B140-BUS CHASSIS	$939.49	$ -	$ -
4500068757	6/10/2025	Madden Construction Inc		P280-GENERAL SVC AGRMNTS	$993.25	$ -	$ -
4500068758	6/10/2025	Transit Holdings Inc		B140-BUS CHASSIS	$2,081.45	$ -	$ -
4500068759	6/10/2025	Network Industries, Inc.		F110-SHOP/BLDG MACHINERY	$877.99	$ -	$ -
4500068760	6/10/2025	Cummins Inc		B120-BUS MECHANICAL PARTS	$202.53	$ -	$ -
4500068761	6/10/2025	Transit Holdings Inc		B140-BUS CHASSIS	$864.50	$ -	$ -
4500068762	6/10/2025	San Diego Friction Products, Inc.		B120-BUS MECHANICAL PARTS	$4,285.22	$ -	$ -
4500068763	6/10/2025	Home Depot USA Inc		G210-OFFICE FURNITURE	$842.26	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068765	6/10/2025	ON-LINE STAMPCO INC	Small Business	G200-OFFICE SUPPLIES	$43.46	$ -	$ -
4500068766	6/10/2025	Home Depot USA Inc		P480-EE MAINTENANCE	$870.92	$ -	$ -
4500068767	6/10/2025	ezCater, Inc		P440-CATERING SERVICES	$615.85	$ -	$ -
4500068769	6/10/2025	San Diego Community		P540-MAINTENANCE TRAINING	$761.73	$ -	$ -
4500068770	6/10/2025	Crane Payment Innovations Inc		G290-FARE REVENUE EQUIP	$1,518.93	$ -	$ -
4500068771	6/10/2025	Cummins Inc		B250-BUS REPAIR PARTS	$4,109.14	$ -	$ -
4500068772	6/10/2025	Charter Industrial Supply Inc	Small Business	G140-SHOP SUPPLIES	$135.08	$ -	$ -
4500068773	6/10/2025	Facility Solutions Group, Inc.		G120-SECURITY	$2,636.44	$ -	$ -
4500068774	6/10/2025	Fastenal Company		G140-SHOP SUPPLIES	$2,439.08	$ -	$ -
4500068775	6/10/2025	AirSuppply Tools, LLC		G150-FASTENERS	$120.14	$ -	$ -
4500068776	6/10/2025	Freeby Signs		B130-BUS BODY	$29.65	$ -	$ -
4500068777	6/10/2025	General Signals Inc		M130-CROSSING MECHANISM	$4,118.64	$ -	$ -
4500068778	6/10/2025	Genuine Parts Company Inc		R180-RAIL/LRV LIGHTING	$4,365.75	$ -	$ -
4500068779	6/10/2025	Harbor Diesel & Equipment, Inc		B120-BUS MECHANICAL PARTS	$198.13	$ -	$ -
4500068780	6/10/2025	Home Depot USA Inc		F110-SHOP/BLDG MACHINERY	$104.94	$ -	$ -
4500068781	6/10/2025	W.W. Grainger Inc		F110-SHOP/BLDG MACHINERY	$472.10	$ -	$ -
4500068782	6/10/2025	Home Depot USA Inc		P120-BLDG/FACILITY REPRS	$193.63	$ -	$ -
4500068783	6/10/2025	Dunn-Edwards Corporation		P280-GENERAL SVC AGRMNTS	$184.75	$ -	$ -
4500068784	6/11/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$16.17	$ -	$ -
4500068785	6/11/2025	Siemens Mobility, Inc.		R120-RAIL/LRV CAR BODY	$811.90	$ -	$ -
4500068786	6/11/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$11.86	$ -	$ -
4500068787	6/11/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$278.87	$ -	$ -
4500068788	6/11/2025	Harbor Diesel & Equipment, Inc		B250-BUS REPAIR PARTS	$16,584.39	$ -	$ -
4500068789	6/11/2025	Inland Kenworth (US) Inc		B250-BUS REPAIR PARTS	$2,143.08	$ -	$ -
4500068790	6/11/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$24,547.88	$ -	$ -
4500068791	6/11/2025	Neopart Transit LLC		B120-BUS MECHANICAL PARTS	$1,750.22	$ -	$ -
4500068792	6/11/2025	Mohawk Mfg & Supply Co		B120-BUS MECHANICAL PARTS	$1,175.95	$ -	$ -
4500068793	6/11/2025	Muncie Reclamation and Supply Co		B160-BUS ELECTRICAL	$4,848.77	$ -	$ -
4500068794	6/11/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$7,599.57	$ -	$ -
4500068795	6/11/2025	Clarran Inc.	DBE	G150-FASTENERS	$459.01	$ -	$ -
4500068796	6/11/2025	Gillig LLC		B250-BUS REPAIR PARTS	$65.36	$ -	$ -
4500068797	6/11/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$56.14	$ -	$ -
4500068798	6/11/2025	Robcar Corporation	Woman Owned Business	P280-GENERAL SVC AGRMNTS	$921.28	$ -	$ -
4500068799	6/11/2025	COX COMMUNICATIONS CA LLC		P280-GENERAL SVC AGRMNTS	$2,100.00	$ -	$ -
4500068800	6/11/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$33,266.28	$ -	$ -
4500068801	6/11/2025	Allied Refrigeration Inc		B250-BUS REPAIR PARTS	$154.52	$ -	$ -
4500068802	6/11/2025	No-Spill Systems Inc		B120-BUS MECHANICAL PARTS	$129.28	$ -	$ -
4500068803	6/11/2025	Waxie's Enterprises, LLC		G140-SHOP SUPPLIES	$1,041.51	$ -	$ -
4500068804	6/11/2025	Laird Plastics, Inc		M180-STATION ELECTRICAL	$4,828.82	$ -	$ -
4500068805	6/11/2025	RJ International LLC	DBE	G190-SAFETY/MED SUPPLIES	$111.33	$ -	$ -
4500068806	6/11/2025	Cummins-Allison Corp.		P280-GENERAL SVC AGRMNTS	$885.57	$ -	$ -
4500068807	6/11/2025	San Diego Friction Products, Inc.		B140-BUS CHASSIS	$609.00	$ -	$ -
4500068808	6/11/2025	W.W. Grainger Inc		G140-SHOP SUPPLIES	$492.60	$ -	$ -
4500068809	6/11/2025	Staples Contract & Commercial LLC		G200-OFFICE SUPPLIES	$1,802.66	$ -	$ -
4500068810	6/11/2025	Harbor Diesel & Equipment, Inc		G170-LUBRICANTS	$6,797.94	$ -	$ -
4500068811	6/11/2025	Professional Contractors Supplies		G180-JANITORIAL SUPPLIES	$576.46	$ -	$ -
4500068812	6/11/2025	W. Baker Management Inc		R160-RAIL/LRV ELECTRICAL	$19,119.16	$ -	$ -
4500068813	6/11/2025	AED Brands LLC		G200-OFFICE SUPPLIES	$1,616.25	$ -	$ -
4500068815	6/11/2025	Home Depot USA Inc		G210-OFFICE FURNITURE	$476.46	$ -	$ -
4500068816	6/11/2025	ODP Business Solutions, LLC		G220-OFFICE EQUIPMENT	$375.74	$ -	$ -
4500068817	6/11/2025	Johnson Health Tech Retail Inc.		F110-SHOP/BLDG MACHINERY	$398.31	$ -	$ -
4500068818	6/12/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$174.56	$ -	$ -
4500068819	6/12/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$822.35	$ -	$ -
4500068820	6/12/2025	Transit Holdings Inc		B130-BUS BODY	$2,347.25	$ -	$ -
4500068821	6/12/2025	Signal Hill Auto Enterprises, Inc.		G180-JANITORIAL SUPPLIES	$4,749.08	$ -	$ -
4500068822	6/12/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$105.90	$ -	$ -
4500068823	6/12/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$234.55	$ -	$ -
4500068824	6/12/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$4,187.57	$ -	$ -
4500068825	6/12/2025	Transit Holdings Inc		B130-BUS BODY	$1,279.17	$ -	$ -
4500068826	6/12/2025	Hogan MFG Inc		B250-BUS REPAIR PARTS	$134.34	$ -	$ -
4500068827	6/12/2025	Robcar Corporation	Woman Owned Business	P280-GENERAL SVC AGRMNTS	$436.40	$ -	$ -
4500068828	6/12/2025	Sway Collective		P310-ADVERTISING SERVICES	$2,677.33	$ -	$ -
4500068829	6/12/2025	Sway Collective		P310-ADVERTISING SERVICES	$2,022.69	$ -	$ -
4500068830	6/12/2025	Steven R Timme		G230-PRINTED MATERIALS	$666.50	$ -	$ -
4500068831	6/12/2025	Neyenesch Printers Inc	Small Business	G230-PRINTED MATERIALS	$1,334.57	$ -	$ -
4500068832	6/12/2025	Daniels Tire Service, Inc		A140-AUTO/TRUCK REPAIR	$1,158.60	$ -	$ -
4500068833	6/12/2025	David Corbin		P440-CATERING SERVICES	$325.27	$ -	$ -
4500068834	6/12/2025	Shilpark Paint Corporation		F180-BUILDING MATERIALS	$767.78	$ -	$ -
4500068835	6/12/2025	Dimensional Silk Screen Inc		G230-PRINTED MATERIALS	$344.81	$ -	$ -
4500068836	6/12/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$498.95	$ -	$ -
4500068837	6/12/2025	VCA Animal Hospitals, Inc.		G120-SECURITY	$67.84	$ -	$ -
4500068838	6/12/2025	North Island LLC		P310-ADVERTISING SERVICES	$1,000.00	$ -	$ -
4500068839	6/12/2025	Uline Inc		G200-OFFICE SUPPLIES	$49.13	$ -	$ -
4500068840	6/12/2025	Zones, LLC	Minority Owned Business	I110-INFORMATION TECH	$96,234.74	$ -	$ -
4500068841	6/12/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$16,083.23	$ -	$ -
4500068842	6/12/2025	Transit Holdings Inc		B130-BUS BODY	$1,176.31	$ -	$ -
4500068843	6/12/2025	Gillig LLC		B250-BUS REPAIR PARTS	$22,349.95	$ -	$ -
4500068844	6/12/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$175.92	$ -	$ -
4500068845	6/12/2025	Mike Farrar		B130-BUS BODY	$10,344.00	$ -	$ -
4500068846	6/12/2025	Brault Inc	Small Business	C130-CONSTRUCTION SVCS	$4,250.00	$ -	$ -
4500068847	6/12/2025	Cummins-Allison Corp.		P280-GENERAL SVC AGRMNTS	$2,622.95	$ -	$ -
4500068848	6/12/2025	Clarran Inc.	DBE	G150-FASTENERS	$29.56	$ -	$ -
4500068849	6/12/2025	Gillig LLC		B140-BUS CHASSIS	$818.87	$ -	$ -
4500068850	6/12/2025	Fordyce Construction Inc	Small Business	C110-GENERAL CONTRACTORS	$146,874.92	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068851	6/13/2025	Cummins Inc		B250-BUS REPAIR PARTS	$240.11	$ -	$ -
4500068852	6/13/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$150.13	$ -	$ -
4500068853	6/13/2025	Transit Holdings Inc		B160-BUS ELECTRICAL	$1,788.25	$ -	$ -
4500068854	6/13/2025	Pacific Star Corporation		G180-JANITORIAL SUPPLIES	$58.46	$ -	$ -
4500068855	6/13/2025	Transit Holdings Inc		B140-BUS CHASSIS	$9.26	$ -	$ -
4500068856	6/13/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$776.12	$ -	$ -
4500068857	6/13/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$180.57	$ -	$ -
4500068858	6/13/2025	Ace Uniforms LLC	Small Business	G200-OFFICE SUPPLIES	$2,354.34	$ -	$ -
4500068859	6/13/2025	Mohawk Mfg & Supply Co		B120-BUS MECHANICAL PARTS	$151.42	$ -	$ -
4500068860	6/13/2025	Home Depot USA Inc		G140-SHOP SUPPLIES	$98.31	$ -	$ -
4500068861	6/13/2025	Team One Repair Inc		G290-FARE REVENUE EQUIP	$5,125.90	$ -	$ -
4500068862	6/13/2025	RJ International LLC	DBE	G140-SHOP SUPPLIES	$1,066.73	$ -	$ -
4500068863	6/13/2025	Staples Contract & Commercial LLC		G200-OFFICE SUPPLIES	$188.30	$ -	$ -
4500068864	6/13/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$770.42	$ -	$ -
4500068865	6/13/2025	Winzer Franchise Company		G140-SHOP SUPPLIES	$293.94	$ -	$ -
4500068866	6/13/2025	Willy's Electronic Supply Co Inc		G270-ELECTRICAL/LIGHTING	$150.53	$ -	$ -
4500068867	6/13/2025	Schunk Carbon Technology LLC		G170-LUBRICANTS	$2,633.41	$ -	$ -
4500068868	6/13/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$165.55	$ -	$ -
4500068869	6/13/2025	The Sherwin-Williams Company		F120-BUS/LRV PAINT BOOTHS	$829.80	$ -	$ -
4500068870	6/13/2025	Airgas Inc		G140-SHOP SUPPLIES	$90.08	$ -	$ -
4500068871	6/13/2025	TK Services Inc		B110-BUS HVAC SYSTEMS	$1,333.78	$ -	$ -
4500068872	6/13/2025	Gillig LLC		B250-BUS REPAIR PARTS	$3,236.18	$ -	$ -
4500068873	6/13/2025	Cummins-Allison Corp.		P280-GENERAL SVC AGRMNTS	$2,363.79	$ -	$ -
4500068874	6/15/2025	Gillig LLC		B250-BUS REPAIR PARTS	$2,500.05	$ -	$ -
4500068875	6/16/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$180.75	$ -	$ -
4500068876	6/16/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$101.89	$ -	$ -
4500068877	6/16/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$316.78	$ -	$ -
4500068878	6/16/2025	Transit Holdings Inc		B130-BUS BODY	$1,813.07	$ -	$ -
4500068879	6/16/2025	Cummins Inc		B200-BUS PWR TRAIN EQUIP	$2,868.17	$ -	$ -
4500068880	6/16/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$450.28	$ -	$ -
4500068881	6/16/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$1,759.76	$ -	$ -
4500068882	6/16/2025	SiteOne Landscape Supply Holding		F190-LANDSCAPING MAT'LS	$1,147.60	$ -	$ -
4500068883	6/16/2025	Home Depot USA Inc		F180-BUILDING MATERIALS	$506.83	$ -	$ -
4500068884	6/16/2025	Network Industries, Inc.		F200-TANK EQUIPMENT	$1,087.75	$ -	$ -
4500068885	6/16/2025	Network Industries, Inc.		F200-TANK EQUIPMENT	$331.50	$ -	$ -
4500068886	6/16/2025	ODP Business Solutions, LLC		P280-GENERAL SVC AGRMNTS	$32.99	$ -	$ -
4500068887	6/16/2025	Transit Holdings Inc		B250-BUS REPAIR PARTS	$461.63	$ -	$ -
4500068888	6/16/2025	W.W. Grainger Inc		F110-SHOP/BLDG MACHINERY	$707.45	$ -	$ -
4500068889	6/16/2025	Ahlee Backflow Service, Inc	Small Business	P140-MAINTENANCE, HVAC	$582.00	$ -	$ -
4500068890	6/16/2025	Interior Plant Service Inc		P280-GENERAL SVC AGRMNTS	$2,568.00	$ -	$ -
4500068891	6/16/2025	Prudential Overall Supply		G140-SHOP SUPPLIES	$349.11	$ -	$ -
4500068892	6/16/2025	Chingon Custom Metal		P210-NON-REV VEH REPAIRS	$2,163.64	$ -	$ -
4500068894	6/16/2025	Supreme Oil Co.		A120-AUTO/TRUCK GASOLINE	$11,846.05	$ -	$ -
4500068895	6/16/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$3,027.02	$ -	$ -
4500068896	6/16/2025	Clarran Inc.	DBE	B250-BUS REPAIR PARTS	$126.70	$ -	$ -
4500068897	6/16/2025	W.W. Grainger Inc		P280-GENERAL SVC AGRMNTS	$333.25	$ -	$ -
4500068898	6/16/2025	Siemens Mobility, Inc.		R160-RAIL/LRV ELECTRICAL	$43,938.56	$ -	$ -
4500068899	6/16/2025	Transit Holdings Inc		B130-BUS BODY	$2,931.27	$ -	$ -
4500068900	6/16/2025	Waxie's Enterprises, LLC		G140-SHOP SUPPLIES	$563.75	$ -	$ -
4500068901	6/16/2025	Home Depot USA Inc		F110-SHOP/BLDG MACHINERY	$76.42	$ -	$ -
4500068902	6/16/2025	Tolar Manufacturing Company Inc		P280-GENERAL SVC AGRMNTS	$1,270.25	$ -	$ -
4500068903	6/16/2025	Crane Payment Innovations Inc		G290-FARE REVENUE EQUIP	$298.91	$ -	$ -
4500068904	6/17/2025	Transit Holdings Inc		B140-BUS CHASSIS	$51.72	$ -	$ -
4500068905	6/17/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$1,345.62	$ -	$ -
4500068906	6/17/2025	Transit Holdings Inc		B140-BUS CHASSIS	$1,478.90	$ -	$ -
4500068907	6/17/2025	Cummins Inc		B250-BUS REPAIR PARTS	$36.40	$ -	$ -
4500068908	6/17/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$290.28	$ -	$ -
4500068909	6/17/2025	Transit Holdings Inc		B130-BUS BODY	$2,288.67	$ -	$ -
4500068910	6/17/2025	San Diego Seal, Inc.	Small Business	G140-SHOP SUPPLIES	$397.98	$ -	$ -
4500068911	6/17/2025	Arts Lawnmower and Repairs LLC		P130-EQUIP MAINT REPR SVC	$1,801.00	$ -	$ -
4500068912	6/17/2025	SC Commercial, LLC		A120-AUTO/TRUCK GASOLINE	$3,027.02	$ -	$ -
4500068913	6/17/2025	Home Depot USA Inc		G200-OFFICE SUPPLIES	$100.56	$ -	$ -
4500068914	6/17/2025	Home Depot USA Inc		G130-SHOP TOOLS	$3,020.19	$ -	$ -
4500068915	6/17/2025	White Cap, LP		G140-SHOP SUPPLIES	$224.27	$ -	$ -
4500068916	6/17/2025	W.W. Grainger Inc		B250-BUS REPAIR PARTS	$22.54	$ -	$ -
4500068917	6/17/2025	Tolar Manufacturing Company Inc		P280-GENERAL SVC AGRMNTS	$5,926.25	$ -	$ -
4500068918	6/17/2025	Freeby Signs		B130-BUS BODY	$156.11	$ -	$ -
4500068919	6/17/2025	Fastenal Company		R230-RAIL/LRV MECHANICAL	$2,353.26	$ -	$ -
4500068921	6/17/2025	R.S. Hughes Co Inc		G140-SHOP SUPPLIES	$298.53	$ -	$ -
4500068922	6/17/2025	Intellichoice Inc		I140-IT CAPITAL SOFTWARE	$61,526.02	$ -	$ -
4500068923	6/17/2025	Charter Industrial Supply Inc	Small Business	B120-BUS MECHANICAL PARTS	$512.44	$ -	$ -
4500068924	6/17/2025	Wesco Distribution Inc		F110-SHOP/BLDG MACHINERY	$288.77	$ -	$ -
4500068925	6/17/2025	Kurt Morgan		G200-OFFICE SUPPLIES	$396.57	$ -	$ -
4500068926	6/17/2025	Asbury Environmental Services		P140-MAINTENANCE, HVAC	$1,752.00	$ -	$ -
4500068927	6/17/2025	Teleqo Technical Solutions, Inc.		I110-INFORMATION TECH	$39,240.00	$ -	$ -
4500068928	6/17/2025	Magaldi & Magaldi Inc		B250-BUS REPAIR PARTS	$35.80	$ -	$ -
4500068929	6/17/2025	Clarran Inc.	DBE	G150-FASTENERS	$56.64	$ -	$ -
4500068930	6/17/2025	Bonsall Petroleum Construction Inc		P140-MAINTENANCE, HVAC	$890.00	$ -	$ -
4500068931	6/17/2025	Grah Safe & Lock Inc	Small Business	P140-MAINTENANCE, HVAC	$500.00	$ -	$ -
4500068932	6/17/2025	Muncie Reclamation and Supply Co		B160-BUS ELECTRICAL	$366.56	$ -	$ -
4500068933	6/17/2025	OneSource Distributors, LLC		M180-STATION ELECTRICAL	$1,508.54	$ -	$ -
4500068934	6/17/2025	OneSource Distributors, LLC		M120-OVRHEAD CATENARY SYS	$767.82	$ -	$ -
4500068935	6/18/2025	San Diego Friction Products, Inc.		G140-SHOP SUPPLIES	$830.76	$ -	$ -
4500068936	6/18/2025	Cummins Inc		B120-BUS MECHANICAL PARTS	$259.53	$ -	$ -

Purchase Orders							
Purchase Orders	**PO Date**	**Name**	**Prime Business Certification**	**Material Group**	**PO Value**	**DBE Subcontracted Amount**	**Non DBE Subcontracted Amount**
4500068937	6/18/2025	Muncie Reclamation and Supply Co		B200-BUS PWR TRAIN EQUIP	$17.99	$ -	$ -
4500068938	6/18/2025	Waxie's Enterprises, LLC		G180-JANITORIAL SUPPLIES	$1,535.05	$ -	$ -
4500068939	6/18/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$1,473.27	$ -	$ -
4500068940	6/18/2025	Transit Holdings Inc		B200-BUS PWR TRAIN EQUIP	$71.22	$ -	$ -
4500068941	6/18/2025	Transit Holdings Inc		B130-BUS BODY	$2,909.51	$ -	$ -
4500068942	6/18/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$2,973.27	$ -	$ -
4500068943	6/18/2025	Bees Lighting		M180-STATION ELECTRICAL	$3,333.52	$ -	$ -
4500068944	6/18/2025	Reid and Clark Screen Arts Co		P210-NON-REV VEH REPAIRS	$237.59	$ -	$ -
4500068945	6/18/2025	Arts Lawnmower and Repairs LLC		F190-LANDSCAPING MAT'LS	$161.58	$ -	$ -
4500068946	6/18/2025	JDK Railroad Materials, Inc.		P280-GENERAL SVC AGRMNTS	$2,478.25	$ -	$ -
4500068947	6/18/2025	ODP Business Solutions, LLC		G200-OFFICE SUPPLIES	$125.31	$ -	$ -
4500068949	6/18/2025	VCA Animal Hospitals, Inc.		G120-SECURITY	$610.56	$ -	$ -
4500068950	6/18/2025	County of San Diego		P130-EQUIP MAINT REPR SVC	$107.32	$ -	$ -
4500068951	6/18/2025	Transit Holdings Inc		B120-BUS MECHANICAL PARTS	$7,399.72	$ -	$ -

EXPENSE CONTRACTS

Doc #	Organization	Subject	Amount	Day
PWB414.1-25	FORDYCE CONSTRUCTION	ECBMF BATTERY STORAGE CCO1	$3,858.92	5/22/2025
L1668.5-24	DIVERGING	ADDITIONAL COUPLER	$5,147.19	5/8/2025
PWG324.0-21JOC34.01	ABCGC	CCO 01	$10,959.13	5/19/2025
PWL356.0-22WOAAE03.06	PRE	XFER FUNDS	$11,059.56	6/2/2025
G2869.1-24	VANTAGE	ADD SERVICE	$13,725.00	6/6/2025
L1564.2-21	MILLER INGENUITY	ADD FUNDS	$21,751.68	5/15/2025
PWL419.1-25	BALFOUR BEATTY INFRASTRUCTURE	CCO 1 - TRASH CLEAN UP REMOVAL	$29,456.18	5/19/2025
G2151.7-18	EDCO	ADD FUNDS FOR OY2	$35,756.71	5/12/2025
PWG324.0-21JOC324-42	ABCGC	CCO 01	$36,899.07	6/9/2025
PWL356.0-22WOAAE46.01	PRE	ADD ODC FUNDS	$46,150.00	5/13/2025
PWG348.0-22JOC17.1	VETERANS	7 ADDITIONAL FLAGGERS	$46,688.43	5/20/2025
G2506.1-21	NAVIA BENEFITS SOLUTIONS	ADD FUNDS	$55,700.40	6/9/2025
B0760.1-24	SUBURBAN PROPANE	ADD FUNDS	$71,672.94	6/3/2025
PWL429.0-25	BAJA WILDLIFE CONTROL	WEED CONTROL SERVICE	$75,660.00	6/9/2025
G2541.0-22WOA-02.03	BRI	ADD FUNDS	$79,045.24	5/8/2025
PWL355.0-22WOA-AE-61	PSOMAS	DSDC FOR BEYER BLVD	$114,913.16	6/3/2025
G2719.2-23	NST	ADD FUNDS AND SUBCONTRACTOR	$148,250.00	5/8/2025
S200-25-907	REGENTS OF UCSD REAL ESTATE	AMERICA PLAZA PROJECT PED ENHANCEMENTS LICENSE	$1,500.00	6/12/2025
B0732.2-21	VMP	ADD FUNDS BRAKE PADS	$72,494.20	6/17/2025

REVENUE CONTRACTS AND MOUs				
Doc #	**Organization**	**Subject**	**Amount**	**Day**
G2683.4-23	SANDAG	YOP MOU	$2,655,300.00	5/28/2025
G0930.17-04.51.1	SANDAG	SCADA	$686,795.36	5/28/2025
G2653.0-23.8	STEVE BINION	SNACKS 12TH & IMP LICENSE	$2,000.00	6/2/2025
S200-25-911	SDGE	ROW PERMIT DE-ENERGIZATION PROJECT 1300 WILSON AVE	$1,072.12	6/9/2025
L5872.0-25	COMPETITOR GROUP	ROCK N ROLL MARATHON ROW	$750.00	5/30/2025
L5298.0-25	CA SHEET METAL WORKS INC	LEASE AGREEMENT	$354,000.00	6/12/2025
G2699.3-23	BAYVIEW POINT LLC	E ST TOD ENA EXT	$100,000.00	6/11/2025
S200-25-879	WHITE CONSTRUCTION	ROW PERMIT FOR 1300 WILSON AVE NATIONAL CITY	$750.00	6/13/2025

Metropolitan Transit System

DATE: June 26, 2025

TO: Board of Directors

FROM: Sharon Cooney, Chief Executive Officer

SUBJECT: MTS Property Related Flooding: Immediate Remedial Measures for January 22, 2024

Authority

Per MTS's enabling legislation at Public Utilities Code Section 120224.1, and per MTS Board Policy No 52, "Procurement of Goods and Services", Section 52.2 (F) (v):

> *Upon determining that immediate remedial measures to avert or alleviate damage to, or to repair or restore damaged or destroyed MTS property are necessary in order to ensure that MTS facilities are available to serve the transportation needs of the general public, and upon determining that compliance with competitive solicitation requirements would result in an impermissible delay, the CEO may authorize the expenditure of money for the direct purchases of goods and services. The CEO, after the expenditure authorized under immediate remedial measures has been made, shall submit to the board a full report explaining the necessity for that action.*

Background

On January 22, 2024, there was a significant rain event that resulted in extensive flooding along MTS property. This rain event caused substantial damage to MTS's rail infrastructure, MTS's rail equipment, MTS's operation and administrative buildings, and other MTS real property. This damage impacted MTS's ability to continue some of its programs and services, including operation of a portion of MTS' trolley service. Since providing trolley service is an essential public service, immediate action was necessary to mitigate the damage and bring back full operations to the trolley service. Compliance with MTS's standard competitive bidding requirements would have resulted in an impermissible delay. Therefore, on January 23, 2024, the CEO authorized staff to conduct the necessary work to remediate the damages immediately, without compliance with standard competitive procurement requirements.

Under these emergency remedial measures, the CEO instructed staff to identify contractors to conduct the necessary work, with a focus on contractors that (1) had the necessary expertise and experience for the work in question, and (2) were ready and available to start work as soon as possible and complete the work in an expeditious manner. Contractors were selected based on their ability to quickly mobilize and complete work at each location; many of the contractors were doing similar work or had recently done similar work for MTS under a competitively bid contract.

The following chart itemizes work that was authorized by the CEO in response to the January 22, 2024 flood event. New entries are noted in red.

Purchase Order No.	Estimated Cost	Actual Cost	Contract or	Description of Work	Contractor Selection Justification	Projected Competitive Procurement Timeline	Projected	Location
4500060487	$2,500,000	$2,500,000.00	DRS Contracting	Track reconstruction and drainage repair	DRS Contracting Inc. was selected because their sister company Veteran's Engineering Inc. had an	Construction IFB, process of 6 months	Ability to immediately commence	Orange Line: Massachusetts to Euclid
4500060475	$2,500,000	$2,500,000.00	Balfour Beatty	Track reconstruction and drainage repair	MTS turned to Balfour Beatty to authorize them to perform this work on 1/24/24, this was the earliest possible time. They had an existing contract in place with MTS for trackwork in other areas, therefore, they had crews and equipment available for immediate mobilization.	Construction IFB, process of 6 months	Ability to immediately commence services	Orange Line: Massachusetts to Euclid
4500061454	$65,251.97	$86,724.28	PGH Wong	Inspection and construction management for track reconstruction	Firm currently under contract as an on- call consultant for Construction Management (CM) Services	Mini RFP through on-call construction management services agreements, process of 4 months	Ability to immediately commence services	Orange Line: Massachusetts to Euclid
4500060499	$1,500,000	$1,500,000.00	Blue Iron	Shoring	MTS met with 3 shoring contractors. Blue Iron was the only firm that had materials on-hand and could start right away. The other two contractors had a 3-month lead time.	Construction IFB, process of 6 months	Ability to immediately commence services	Orange Line: Near 65th crossing
4500060986	$120,000	$120,000.00	HMS	Overhead catenary system repairs	Firm currently under contract as an on- call consultant for JOC Overhead Catenary System (OCS)	Construction IFB process of 6 months	Ability to immediately commence services	Orange Line: Near 65th
4500060094	$140,570.00	$140,570.00	AECOM	Inspection and construction management for shoring and system/signals	Firm currently under contract as an on- call consultant for CM Services	Mini RFP through on-call CM services agreements, process of 4 months	Ability to immediately commence services	Orange Line: Near 65th
4500059857	$5,961	$5,961.00	Overhead Door Company of Southern	Purchase and install roll up door	Firm specializes in providing roll up door products and services	RFQ process of 1-2 months	Services scheduled to	Pyramid Building, Bay 3
4500060232	$58,800	$58,800.00	National Electrical Testing and Engineeri ng, LLC (NETE)	Testing and repairs prior to regeneration of substations	Previous experience on testing and commissioning of substations for both the Mid Coast and Blue/Green lines.	RFQ process of 1-2 months	Ability to immediately start repairs	Green Line: San Altos Substation
4500062947	$250,000	$257,537.40	Clean Harbor	Trolley Building Pump-out	Personnel availability, immediate mobilization, and past work performance.	Formal IFB, process of 4-6 months	Ability to immediately commence services	LRV Maintenance Facility (Building C)
4500059608	$27,093	$27,093.10	Badger Day Lighting	Clean-out LRV Maintenance pits	Prompt mobilization and prior work performance	RFQ process of 1-2 months	Ability to immediately start repairs	LRV Maintenance Facility (Building C)
4500060233	$19,668.53	$19,668.53	NMS Management, Inc.	Strip and waxing of Building C Shop Floors for proper sanitation of shop floors	Janitorial expertise, personnel availability, immediate mobilization, and past work performance	RFQ process of 1-2 months	Ability to immediately start repairs	LRV Maintenance Facility (Building C)
4500059669	$14,484.17	$14,484.17	National Business Furniture (NBF)	Replace office furniture for SDTI staff (manager, project coordinator and shop supervisor)	Staff attempted to receive quotes from National Business Furniture, Madison Liquidators and Office Depot, Items are readily available for shipment and assembled, MTS chose NBF	RFQ process of 1-2 months	Ability to immediately ship furniture	LRV Maintenance Facility (Building C)
4500059667	$5,039.04	$5,384.46	National Business Furniture	Replace office furniture for SDTI LRV Director	Staff attempted to receive quotes from National business Furniture, Madison Liquidators and Office Depot, Items are readily available for shipment and assembled, MTS chose NBF	RFQ process of 1-2 months	Ability to immediately ship furniture	LRV Maintenance Facility (Building C)
4500059748	$14,769.07	$14,769.08	Gillig LLC	Purchase exterior mirrors (inventory item) for LRVs that were ripped off/damaged during storm	Staff attempted to attain quotes, received two from Gillig and Siemens. Gillig was the lowest bidder.	RFQ for inventory item, process of 7 days	Ability to immediately ship	LRV Maintenance Facility (Building C)
4500061162	$160,000	$127,697.32	ABCGC	Building A Interior Clean up, Building C Exterior Pressure Washing and Clean up, San Altos Substation Clean up, 65th & Imperial Slope SWPPP and BMP installation to support the shoring contractor at this location, 65th & Imperial fence that was replaced to support the shoring contractor at this location, 54th & Market fence installation near the pedestrian crossing	Personnel availability, immediate mobilization, and past work performance.	Construction IFB, process of 6 months	Ability to immediately commence services.	Building A, Building C. San Altos Substation, 65th & Imperial Slope,65th & Imperial fence, 54th & Market fence.

Purchase Order No.	Estimated Cost	Actual Cost	Contract or	Description of Work	Contractor Selection Justification	Projected Competitive Procurement Timeline	Projected	Location
4500060050	$7,176.00	$7,176.00	World Oil	Perform C2 Clarifier Clean Out due to flood	MTS turned to World Oil to perform this work based on their expertise of normal disposal, past purchase history with MTS, and previous work performance.	RFQ process of 30-60 days	Ability to immediately commence services	LRV Department
4500060078	$12,200.00	$12,200.00	Josephson Werdowatz	Structural analysis of the collapsed section of the roof on the Pyramid building, as well as designs on required repairs are necessary in order to ensure the building is safe for further crews to enter the building for additional repairs and to return the building to full	Based on previous work with MTS, specifically its previous work with MTS on structural improvements to this building in particulate.	RFQ process of 30-60 days	Ability to immediately commence services.	Pyramid Building
4500041657	$12,865.00	$12,865.00	NSH USA Corp.	Wheel truing machine evaluation.	NSH had drawings, technical support, knowledge of operation and past work performance.	RFQ process of 30-60 days	Ability to immediately commence services	LRV Department – Building C
4500060310	$11,801.44	$11,804.44	NMS Management	Cleaning, waxing and sealing of New Vinal floors in A Building, C Building and Yard Tower	NMS Management was identified due to its janitorial expertise, personnel availability, immediate mobilization, and past work performance.	RFQ process of 30-60 days	Ability to immediately commence services	Buildings A and C, and Yard Tower
4500060985	$1,360,874.00	~~Not yet Finalized~~ $910,000.00	Carlos Guzman	Above-ground Wheel Truing Machine Replacement for LRV Department	Staff learned Carlos Guzman hasd purchased a wheel truing machine that has only been in service for 4 ½ years and offered to sell it to MTS. Delivery of unit is 8-10 weeks compared to purchasing a brand new machine that would cost more and take longer to arrive with a lead time of 18 months from NTP.	IFB 4-6 months plus Lead time of 18 months	Availability of machine with a very short lead time.	LRV Maintenance – Building C
4500061382	$109,548.85	$109,548.85	Legend to Kings Fence, Inc	Fencing Repair at Euclid Ave Station to Lemon Grove Station	MTS turned to LTK Fence to authorize them to perform this work. LTK Fence was identified due to its fencing expertise, personnel availability, and immediate mobilization.	Construction IFB, process of 6 months	Ability to immediately commence services	Euclid Ave Station to Lemon Grove Station
4500061099	$1,500,000	$1,408,455.91	DRS Contracting	Grade crossing on Euclid and Euclid Bridge repair	DRS was selected because they are currently mobilized on another project and have crews, equipment and long-lead time materials available for immediate mobilization.	Construction IFB, process of 6 months	Ability to immediately commence services	Euclid and Euclid Bridge
4500060538	$67,500	$67,500.00	Atlas	Trees were damaged during flood	Contractor has an existing on call tree trimming contract in place, personnel availability, immediate mobilization, and past work performance. Delays mean that track and OCS could have been damaged.	RFQ process of 30-60 days	Ability to immediately commence services	Orange Line - Intersection of Massachusetts and 69th
4500059776	$6,854	$8,527.00	Hitachi	Part replacement	Existing MTS contractor for replacement services	RFQ process of 1-2 months	Ability to immediately commence services	Wayside
4500060161	$8,105.29	$8,105.29	Otay Mesa Sales, Inc.	MTS Track department used this equipment for (1) one month to help restore tracks and clean up trash	Identified due to large inventory, machine availability and ability for immediate mobilization	RFQ process of 1-2 months	Ability to immediately commence services	Orange Line – Massachusetts Station
4500061003	$187,680	$158,859.00	BBM Railway Innovations	Lifting Equipment	Sole Source – MACTON provided the lifts that were damaged. BBM bought out MACTON around 2018. BBM supplied similar replacement lifts	Formal IFB, process of 4-6 months	Availability to provide good with a very short lead time.	Trolley – LRV Maintenance
4500063310	$269,012.80	Not yet Finalized	BBM Railway Innovations	Lifting Equipment	Sole Source – MACTON provided the lifts that were damaged. BBM bought out MACTON around 2018. BBM supplied similar replacement lifts	Formal IFB, process of 4-6 months	Availability to provide good with a very short lead time.	Trolley – LRV Maintenance
4500060764	$58,600	Not yet Finalized	Kleinfelder	AE eval of sheet pile shoring	familiarity on the soil vicinity due to the past projects	Mini A&E RFP of 4 month	Ability to immediately commence services	Orange Line - Shoring Wall at 65th Street

Purchase Order No.	Estimated Cost	Actual Cost	Contract or	Description of Work	Contractor Selection Justification	Projected Competitive Procurement Timeline	Projected	Location
4500063115	$1,857,000	Not yet Finalized	Siemens	Repair damaged drive units	Existing MTS contractor for repair services	Formal IFB, process of 4-6 months	Ability to immediately commence services	LRV Department
4500061162	$145,000	$127,697.32	ABGGC	Emergency cleanup and repairs	Existing MTS contractor for JOC services	Formal IFB, process of 4-6 months	Ability to immediately commence services and mobilize equipment and crews	Various locations
4500060841	$5,071.50	$9,561.36	Asbury Environmental Services	Removal of oil from C4/5 In-Floor Hoist Pits	Existing MTS contractor for services	RFQ process of 1-2 months	Ability to immediately commence services	LRV Maintenance – Bldg C
This is an amendment to PO 4500061454	$21,508.31	$21,508.31	PGH Wong	Inspection and construction management for track reconstruction	CM Services	Mini RFP through on-call construction management services agreements, process of 4 months	Ability to immediately commence services	Orange Line: Massachusetts to Euclid
4500065104	$166,133.27	$166,133.27	Jacobs Project Management Co.	CM services for Las Chollas Bridge emergency repair related to the January 2024 flood.	Jacobs is MTS' bridge inspector	Mini RFP through on-call CM services agreements, process of 4 months	Ability to immediately commence services	Las Chollas Bridge
4500062668	$75,900.00	$75,900.00	Baker Electric and Renewables, LLC	Electrical Utility Setup for new Wheeltrue machine	Past work performance, expertise and availability.	Formal IFB, process of 4-6 months	Ability to immediately commence services	LRV Maintenance – Bldg C
4500062733	$25,000.00	$21,151.75	Urban Corps of San Diego	Flood Emergency - Debris cleanup	Existing MTS contractor for debris clean- up services, personnel availability, and quick mobilization.	RFQ process of 1-2 months	Ability to immediately commence services	Various locations
4500063680	$7,800.00	$49,197.14	HJR Equipment Rental, Inc.	Engineering Service Site Visit for Hold Downs	Sole Source - Contractor is original equiment manufacturer (OEM) possess proprietary drawings and specifications needed to engineer hold downs.	RFQ process of 1-2 months	Ability to immediately commence services	LRV Maintenance – Bldg C
PR # 10130086; PO # 4500065230	$439,973.60	$415,631.00	ATI Restoration	Emergency Flood Services for Bldg A	Flood restoration expertise, personnel availability, immediate mobilization, and past work performance.	Formal IFB, process of 4-6 months	Ability to immediately commence services	SDTI Bldg. A
PR # 10132309	$900,002.49	$910,405.76	Balfour Beatty	Las Chollas Bridge Repairs Construction	Knowledge and expertise, personnel availability, immediate mobilization.	Formal IFB, process of 4-6 months	Formal IFB, process of 4-6 months	Las Chollas Bridge
4500064912 (Line 1)	$658,028.79	$639,405.34	Belfor Property Restoration	Flood Services in Building C, Yard Tower, Paint Booth and Boogie Room	Flood restoration expertise, personnel availability, immediate mobilization, and past work performance.	Formal IFB, process of 4-6 months	Formal IFB, process of 4- 6 months	Building C, Yard Tower, Paint Booth and Boogie Room
4500064056	$15,126.70	$15,126.70	JR Bardin	Structural inspection and ongoing construction support during the inspection and repair phases of the Pyramid building.	Was identified due to its previous work with MTS, specifically its previous work with MTS on structural improvements to this building in particular.	Informal would take 30-60 days	Informal would take 30- 60 days	Pyramid Building
PR # 10131933; PO: 4500064752	$210,000.00	$207,581.52	Mott MacDonald	AE Service Las Chollas Bridge Repair	Contractor is already under contract with MTS to prepare engineering plans in response to annual bridge reports so they have familiarity with the bridge.	Mini RFP through on-call construction management services agreements, process of 4 months	Ability to immediately commence services	Las Chollas Bridge
PO:4500064912 (Line 2)	$617,055.31	$617,055.31	Belfor Property Restoration	Reconstruction of Building C, Bogie Building, Paint Booth and Yard Tower after the January 22nd Flood.	Flood restoration expertise, personnel availability, immediate mobilization, and past work performance.	Formal IFB, process of 4-6 months	Formal IFB, process of 4- 6 months	Building C, Yard Tower, Paint Booth, and Boogie Room
PO: 4500064912 (Line 3)	$72,610.55	$72,610.55	Belfor Property Restoration	Inspections, remediations, restorations of Pyramid Building after the January 22nd Flood.	Flood restoration expertise, personnel availability, immediate mobilization, and past work performance.	Formal IFB, process of 4-6 months	Formal IFB, process of 4- 6 months	Pyramid Building
PO: 4500064912 (Line 4)	$88,025.08	$88,025.08	Belfor Property Restoration	Reconstruction of Pyramid Building after the January 22nd Flood.	Flood restoration expertise, personnel availability, immediate mobilization, and past work performance.	Formal IFB, process of 4-6 months	Formal IFB, process of 4- 6 months	Pyramid Building
	$16,298,089.76	$13,530,721.24	Total (as of 06/18/2025)					

Agenda Item No. 5

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Copley Park Division (CPD) Modular Building Replacement Design-Build Bridging Documents – Sole Source Work Order Amendment

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors:

1) Ratify Sole Source Work Order WOA355-AE-44, under MTS Doc No. PWL355.0-22 (Attachment A), with Psomas in the amount of $123,205.20 for preliminary design services to generate program validation documents as part of the design-build bridging documents package for the replacement of the existing modular building at CPD; and

2) Authorize the Chief Executive Officer (CEO) to execute Work Order WOA355-AE-44.01 under MTS Doc No. PWL355.0-22 (in substantially the same format as Attachment B), with Psomas, in the amount of $357,356.64, to provide engineering design services to compile a complete package of design-build bridging documents for the replacement of the existing modular building at CPD and for preliminary submission to the City of San Diego for multi-disciplinary review and approval.

Budget Impact

The total cost of this amendment is estimated to be $357,356.64, and the total cost of the work order is $480,561.84 (inclusive of this amendment). The project will be funded by Capital Improvement Project (CIP) account 1004124101 – CPD Modular Building Replacement Design.

DISCUSSION:

There is an existing modular building used for driver training at MTS's CPD that was installed over the old Miramar South Landfill. Since its installation, the building has experienced settling and damage over time caused by the landfill. Due to continuous maintenance costs, the existing building is not the best long-term location for the training. In addition to settlement under the building, several light poles are leaning, presumed due to settlement.

On June 15, 2023 (Agenda Item (AI) 12), the MTS Board of Directors approved work order WOA355-AE-16 with Psomas to conduct a planning study of the existing property to provide options for replacing the building in an alternate location, provide mapping of existing utilities at

the site and a photometric study with light layout options to replace site lighting. From the results of the planning study, MTS staff selected a design option to pursue more in-depth.

The decision was made to eventually solicit the final design and construction of the modular building replacement as a design-build project. As part of the design-build process, a complete set of bridging documents is necessary to act as a program validation and a basis of design.

On February 7, 2025, under the authority delegated to the Chief Executive Officer under Board Policy 41 (Signature Authority), MTS executed a sole source work order WOA355-AE-44 with Psomas to build upon the work of the 2023 planning study and provide preliminary design services to generate program validation documents as part of the design-build bridging documents package for the future design-build replacement of the existing modular building present at CPD. The purpose of the program validation was to provide baseline design criteria for the generation of a complete set of bridging documents.

The work order WOA355-AE-44 was awarded as a sole source to Psomas based on the planning study work that was completed in 2023. Staff deemed it necessary to contract with Psomas for the preliminary design-build bridging documents because a new architectural and engineering consultant would be required to duplicate significant due diligence work already completed by Psomas as part of the planning study, including review of multiple community health and safety plans, as well as ongoing monitoring of site conditions during construction due to the site being partially located over the old Miramar South landfill and clay cap.

Today's proposed action would issue an amendment to the Psomas work order agreement to progress the design to a complete set of design-build bridging documents with preliminary submittal to the City of San Diego.

On November 12, 2024, Psomas submitted a proposal in the amount of $517,201.04. Through negotiations, staff was able to reduce the fee by $159,273.74, ~31% savings. Furthermore, this amendment reallocates $35,845.30 in unspent funds from tasks 1 and 3 of the original Work Order to tasks 1 and 3 of the amendment. The total cost of Work Order WOA355-AE-44.01 is $347,356.64. Based on the level of effort and classifications, Psomas' revised proposal was determined to be fair and reasonable. Psomas has designated subcontractors' Anil Verma, a Disadvantaged Business Enterprise (DBE) in the amount of $279,195.20, and Coffman Engineers in the amount of $29,062.88 for this Work Order Amendment No. 1.

Work Order and amendments are summarized below:

Work Order No	Purpose	Amount	Approval Date
WOA355-AE-44	Program validation and design criteria development	$123,205.20	CEO Authority under Board Policy 41
WOA355-AE-44.01	Completion of full design-build bridging documents	$357,356.64	Today's proposed action
	Total	**$480,561.84**	

Therefore, staff recommends the MTS Board of Directors:

1) Ratify Work Order WOA355-AE-44, under MTS Doc No. PWL355.0-22 (Attachment A), with Psomas in the amount of $123,205.20 for preliminary design services to generate program validation documents as part of the design-build bridging documents package for the replacement of the existing modular building at CPD; and

2) Authorize the CEO to execute Work Order WOA355-AE-44.01 under MTS Doc No. PWL355.0-22 (in substantially the same format as Attachment B), with Psomas, in the amount of $357,356.64, to provide engineering design services to compile a complete package of design-build bridging documents for the replacement of the existing modular building at CPD and for preliminary submission to the City of San Diego for multi-disciplinary review and approval.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachments: A. Executed Work Order WOA355-AE-44
B. Draft Work Order Amendment WOA355-AE-44.01

Metropolitan Transit System

January 16, 2025

MTS Doc. No. PWL355.0-22
Work Order No. WOA355-AE-44

Mrs. Sarah Curran, PE
Vice President
Psomas
401 B Street, Suite 1600
San Diego, CA 92101

Dear Mrs. Curran:

Subject: WORK ORDER WOA355-AE-44 TO MTS DOC. NO. PWL355.0-22, CPD MODULAR BUILDING REPLACEMENT PHASE 1 - PROGRAM VALIDATION

This letter shall serve as our agreement for Work Order WOA355-AE-44 to MTS Doc. No. PWL355.0-22, for professional services under the General Engineering Consultant Agreement, as further described below.

SCOPE OF SERVICES

This Work Order shall provide design services for CPD Modular Building Replacement Phase 1 - Program Validation. Services shall be performed in accordance with the attached Scope of Services (Attachment A)

SCHEDULE

The Schedule for this Work Order shall be for a period of twelve (12) weeks from the date of the Notice to Proceed.

PAYMENT

Payment shall be based on actual costs in the amount of $123,205.20 (Attachment B). The Work Order amount shall not be exceeded, without prior authorization of MTS.

Please sign below, and return the document to the Contracts Specialist at MTS. All other terms and conditions shall remain the same and in effect.

Sincerely,

Sharon Cooney
Chief Executive Officer

Accepted:

Sarah Curran, Vice President
Psomas

Date: February 7, 2025

Attachments: Attachment A, Scope of Services
Attachment B, Negotiated Fee Proposal

ATTACHMENT A
SCOPE OF SERVICES

TITLE: CPD Modular Building Replacement Phase 1 - Program Validation **WOA #:** WOA355-AE-44

I. PROJECT DESCRIPTION

The San Diego Metropolitan Transit System, (referred to hereafter as “MTS”) has selected Psomas to provide Consultant services for preparation of the Design Criteria package to support a design build bid for the modular building replacement at MTS’s Copley Park Division (referred to hereafter as “CPD”). The proposed infrastructure is the full demolition of the existing modular building, and the construction of a new two-story structure on the south elevation of the existing administrative building. The Modular Building Replacement design criteria is to be based on the CPD Modular Building Replacement Planning Study (Planning Study) dated 12/21/23. It is anticipated the project will include the following:

- A maximization of usable interior area in the allotted footprint of the building.
- Infrastructure and programming to exceed the existing space present in the existing modular building as approved as part of the Planning Study.
- Provide for implementation with minimal disruptions to current service.
- Located south of the existing administrative building and connected via a breezeway.
- Minimal impact to existing face of building.
- Elevator and stairs located off breezeway rather than interior of new structure.
- Demolition of the existing modular building to be replaced.
- Stormwater management
- EV Charging Stations as required to comply with 2022 CalGreen
- Provisions for rooftop mounted solar panels
- Maintenance of the existing clay cap over the landfill
- After occupancy of the new building, demolition of the existing modular building and replacement with pavement/additional parking
- Large interior light pole as well as new perimeter lighting to replace multiple leaning poles within the parking lot.

The scope of work related to the Consultant Team includes the following:

- Preparation of Aerial Topographic and Boundary Survey.
- Program validation for the proposed facility and existing site renovations. This includes site planning layout for preferred parking reconfiguration at the removed modular building, identification of utility points of connection and concept stormwater management analysis.

II. SCOPE OF WORK

The scope of work shall consist of the following tasks and deliverables:

TASK 1: PROJECT MANAGEMENT

1.1 Invoicing, Scheduling, Progress Report and Administration

Consultant shall provide project management services that will include monthly progress reports, invoicing and administration of the project. As part of this task the Consultant will be responsible to maintain schedule compliance of final deliverables for this task order. Work elements include:

- Provide project management services including the requirements for invoicing, scheduling, and monthly project progress reports.
- Develop and implement a project schedule to complete the Scope of Work and manage the project to eliminate or minimize supplemental agreements.
- Prepare monthly status reports and project schedules which are to be submitted with invoices. The status report must outline all activities for which charges have been made by the Consultant or sub-Consultants. The Consultant shall prepare a draft status report and submit it for approval prior to submitting the first invoice.

OUTPUT: *Monthly invoices, progress reports, schedule updates as needed*

1.2 Subconsultant oversight and submittal package assembly

Consultant shall provide subconsultant oversight to maintain progress towards each design milestone. This includes collection of deliverables from each subconsultant and assembly into the overall submittal package to MTS. It is assumed there will be a draft and final submittal of the Design Criteria Package to MTS including one review cycle.

1.3 Quality Assurance and Quality Control

Provide QA/QC on all deliverables. To ensure quality of work and compliance with the scope of work, the Consultant shall perform a systematic in-house review of all documents produced prior to each milestone submittal. All reviewed documents shall have a check box or signature indicating a review has been performed.

1.4 Meetings

Arrange and facilitate Project Development Team (PDT) meetings, interagency meetings, field reviews, and other project-related meetings. The purpose of these meetings will be to review project status to ensure that the contract objectives and milestones are being achieved. To supplement these meetings, we will maintain on-going communications with MTS and agencies identified in this scope. Progress meetings with MTS staff will be held at monthly intervals.

Consultant shall prepare meeting agendas, meeting minutes, necessary supplemental materials, and meeting sign-in sheets for all meetings. For the purposes of this proposal, we have budgeted for:

- 4 bi-weekly PDT meetings
- 2 meetings with the MTS Project Manager and PDT
- 4 additional meetings between MTS Project Manager and Psomas

OUTPUT: *Meeting agendas and minutes, action items list, and decision log.*

TASK 2: SURVEY

2.1 Boundary Survey and Easement Analysis

- Locate and confirm the boundary limits of both properties, as shown and identified as Parcels 2 & 3 of Parcel Map No. 17678.
- Delineate any plottable Easements that affect the subject property as disclosed in a Title Report for APN's 356-410-08-00 & 356-410-09-00 (obtained by Consultant).
- If any of the monuments are missing, Consultant will reset those corners with a monument stamped "LS 9425" and file a Corner Record with the County of San Diego, per Section 8771(b) of the Business and Professions Code. A copy of the finalized filed Corner Record will be provided upon completion. (Reference PROFESSIONAL LAND SURVEYORS' ACT Business and Professions Code §§ 8700 – 8805)

Assumptions:

- Properties are Parcels 2 & 3 of Parcel Map No. 17678
- Corner Record filing timing and finalization is dependent on County of San Diego and processing
- Does not include any conflict check or exhibit identifying any possible encroachments or boundary dispute analysis.
- If a Record of Survey is required on this project, a change order will be created and sent to client for review and acceptance. Consultant will update client(s) immediately upon knowledge of this requirement.

2.2 Aerial Topographic Survey

Topographic Mapping will be prepared at a 20-scale with 1-foot contours situated on NAD83 and sea level coordinate/vertical datums as determined by 3rd party digital imagery vendor geolocation algorithm. Location and elevations will not be rectified to municipal control of any kind.

Items to be plotted include:

- Existing building footprints
- Spot elevations in level areas
- Existing improvements (unless under cover/canopy)
- Trees by location of crown
- Existing visible surface utilities
- Signs / Poles
- Locate walks, curbs, gutter, and centerline along frontage
- Existing parking stripes

Deliverable will be signed PDF Exhibit, showing the Topographical Survey, Boundary Survey and Easement Analysis.
Includes .DWG deliverable of each file.

Assumptions:
- Site has free and non-restricted access on and around the site.
- Manholes and utilities are accessible and unlocked.
- Limits of topographical survey will be to exterior boundary line and extended from side lines of boundary to the centerline of Copley Park Place.

OUTPUT: *Survey Exhibit in both .PDF and .DWG format*

TASK 3: PROGRAM VALIDATION

The development of the Program Validation documents is to be based on the final conceptual plan developed as part of the Planning Study.

3.1 Data Collection and Review

- Collect relevant and available as-builts from MTS and outside agencies required for the design. This may include record structural documents for the existing administrative building and as built utility information from MTS and project adjacent utility purveyors.
- Consultant shall review and evaluate collected information for the proposed work area, including available information and MTS design guidelines, local jurisdiction requirements, ADA standards and other pertinent information that may apply.
- Conduct initial site visits with MTS for review of project, confirmation of existing conditions, and examine existing environment, structures, and facilities.
- Conduct a review of the CHSP (community health safety plan) and COP (continuing obligation plan) that are in place regarding this facility. MTS would like to avoid any new construction over old Miramar South Landfill areas that are marked as areas over garbage (reference attached CHSP and COP).
- Confirm with MTS the existing space needs for the administration, operational, bus maintenance, vehicle parking, and bus parking for incorporation into the Schematic Level (15%) Design Criteria Documents.

OUTPUT: *Analysis Report*

3.2 Existing Conditions Base Map

Consultant shall create an Existing Conditions Base Map using the aerial topographic survey and boundary developed in Task 2 supplemented with additional information collected as part of Task 3.1 above. This map will be located in real world coordinates and will include contours, structures, and available utility information.

OUTPUT: *Existing Conditions Base Map*

3.3 Program Validation

Consultant shall meet with MTS representatives to confirm project goals, system performance expectations and standards to be implemented. Consultant shall validate, develop, and refine the conceptual plans prepared as part of the Planning Study, prior to proceeding with the preparation of Design Criteria Documents. Work elements include:

3.3.1 User Group Meetings

The PDT including Psomas and Anil Verma & Associates (AVA) will attend two (2) User Group Meetings with MTS at the project site. During these meetings conceptual site plans and

floor plans will be reviewed with facility users to identify opportunities for refinement. Psomas and AVA shall prepare a revised site plan and floor plans for review and confirmation by MTS prior to proceeding with preparation of Schematic Level (15%) Design Criteria documents.

3.3.2 Utility Capacity Studies

Consultant will review available record drawings and utility surveys to confirm available onsite points of connection for domestic water, fire water, sanitary sewer and storm drain as well as the need for any new public or private fire hydrants to serve the proposed project.

- Determine existing and proposed building loads tributary to each onsite utility to confirm available capacity.
- MTS will provide flow and pressure tests as required.
- If existing onsite utilities are determined to have insufficient capacity to support the project, notify MTS and make recommendations for offsite connections. Designs, agency coordination and obtaining will serve letters for offsite connections are excluded from this scope of service.
- Determine conceptual layout of backbone civil utility infrastructure within the Project limits based on the above.
- Consultant shall determine code compliance as it relates to the existing fire service including both hydrants and access.
- Review the most recent site plan and utility information to determine site electrical load needs. Discuss with MTS staff, so critical information is carried forward. Existing as-builts provided by MTS are assumed to show size of the existing transformer and all existing loads on the existing transformer.

3.3.3 Conceptual Stormwater Management

Consultant shall provide concept recommendations for long-term post-construction Best Management Practices (BMPs) for managing storm water within the project limits in accordance with the most current City of San Diego regulations:

- Based on the conceptual site plan refined as part of this task, Consultant will identify the options for storm water treatment best management practices (BMPs). Options will be reviewed with MTS Project Manager to confirm preferred method of stormwater treatment.
- Consultant will prepare preliminary calculations to determine concept BMP sizing to confirm space requirements. Site plan will be refined to incorporate space within site program for selected stormwater management BMPs.

OUTPUT: *MTS approved site plan and floor plans*

III. PERIOD OF PERFORMANCE

This work order shall be for a period of 12 weeks from the date of the Notice to Proceed.

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IV. DELIVERABLES

The schedule of deliverables is contingent upon receiving timely comments from the City of SanDiego, MTS, and SDG&E.

1. Monthly Progress Reports
2. Meeting Minutes
3. Survey
4. Program Validation Site Plan and Floor Plans

V. SCHEDULE OF SERVICES/MILESTONES/DELIVERABLES

A. Tasks Schedule

Task	Begin/End Dates
Task 1: Project Management	NTP + 12 weeks
Task 2: Survey	NTP + 6 weeks
Task 3: Program Validation	NTP + 12 weeks

B. Milestones/Deliverables Schedule

Milestone/Deliverable	Due Date
Monthly Progress Reports	Monthly
Survey	NTP + 6 weeks
Program Validation Site Plan and Floor Plans	NTP + 12 weeks

VI. MATERIALS TO BE PROVIDED BY MTS AND/OR THE OTHER AGENCY

A. Project documentation and background reports from prior work efforts to be used as basis of design.
B. MTS to provide any Geotechnical data/reports in their possession for use in design.
C. Onsite fire flow and pressure tests
D. MTS provided all available aerial and utility / ground survey and existing as-built documents of the CPD buildings on site as part of the previous Planning Study.
E. CHSP (community health safety plan) and COP (continuing obligation plan)

VII. SPECIAL CONDITIONS

Any condition listed below applies solely to this Work Order and does not otherwise alter the Agreement or other Work Orders.

A. The project delivery method will be using the design build approach.
B. All deliverables will be provided in electronic format.
C. All stated opinion of probable cost estimates primary characteristics based on the Association for the Advancement of Cost Engineering (AACE) classification definitions.
D. Performance requirements to include request for design of solar / PV system.
E. Existing gasoline and propane tanks could be relocated onto the east property to make room for the new space but needs Fire Dept. approval.
F. Staff break area is currently under portable canopies in the southeast corner of the parking area of the west property. This could be relocated if needed.

VIII. MTS ACCEPTANCE OF SERVICES:

Contractor shall not be compensated at any time for unauthorized work outside of this Work Order. Contractor shall provide notice to MTS' Project Manager upon 100% completion of this Work Order. Within five (5) business days from receipt of notice of Work Order completion, MTS' Project Manager shall review, for acceptance, the 100% completion notice. If Contractor provides final service(s) or final work product(s) which are found to be unacceptable due to Contractors and/or Contractors subcontractors negligence and thus not 100% complete by MTS' Project Manager, Contractor shall be required to make revisions to said service(s) and/or work product(s) within the Not to Exceed (NTE) Budget. MTS reserves the right to withhold payment associated with this Work Order until the Project Manager provides written acceptance for the 100% final completion notice. Moreover, 100% acceptance and final completion will be based on resolution of comments received to the draft documents and delivery of final documentation which shall incorporate all MTS revisions and comments.

Monthly progress payments shall be based on hours performed for each person/classification identified in the attached Fee Schedule and shall at no time exceed the NTE. Contractor shall only be compensated for actual performance of services and at no time shall be compensated for services for which MTS does not have an accepted deliverable or written proof and MTS acceptance of services performed.

IX. DEFICIENT WORK PRODUCT

Throughout the construction management and/or implementation phases associated with the services rendered by the Contractor, if MTS finds any work product provided by Contractor to be deficient (i.e., not meeting the professional standard of care) and the deficiently delays any portion of the project, Contractor shall bear the full burden of their deficient work and shall be responsible for taking all corrective actions to remedy their deficient work product including but not limited to the following:

- Revising provided documents,

At no time will MTS be required to correct any portion of the Contractors deficient work product and shall bear no costs or burden associated with Contractors deficient performance and/or work product.

X. DELIVERABLE REQUIREMENTS

Contractor will be required to submit any and all documentation required by the Scope of Work. The deliverables furnished shall be of a quality reasonably acceptable to MTS. The criteria for acceptance shall be a product of neat appearance, well-organized, and procedurally, technically and grammatically correct. MTS reserves the right to request a change in the format if it doesn't satisfy MTS's needs. All work products will become the property of MTS. MTS reserves the right to disclose any reports or material provided by the Contractor to any third party.

Contractor shall provide with each task, a work plan showing the deliverables schedule as well as other relevant date needed for Contractor's work control, when and as requested by MTS.

Contractor's computer data processing and work processing capabilities and data storage should be compatible with Windows compatible PC's, text files readable in Microsoft Word, and standard and customary electronic storage. Contractor shall maintain backup copies of all data conveyed to MTS.

Contractor shall provide MTS with hard copy or electronic versions of reports and/or other material as requested by MTS.

XI. PRICING

Except where otherwise noted herein, pricing shall be firm and fixed for the duration of the Work Order and any subsequent Change Orders/Amendments to the Work Order. There shall be no escalation of rates or fees allowed.

XII. ADDITIONAL INFORMATION

List additional information as applicable to the specific Work Order scope of services.

Assumptions:

- Design Criteria Package prepared by Consultant as part of this work order will be used to support the overall design build bid package prepared by MTS.
- Proposal assumes all work to be wholly contained onsite and no provisions have been made for specification of criteria for offsite improvements. No new or replacement connections to public utilities are anticipated in this work.
- The governing code will be the 2021 IBC, 2022 CBC and related amendments.
- Conventional foundation system (spread footings at columns and continuous footings at bearing walls) is presumed to be adequate to support the proposed structure at the designated site.
- Existing structures will not require significant redesign.
- The new building/space shall be located west of the limits of the landfill limits.
- The new space needs to have at least the same square footage as the existing modular building. The existing building size is absolute minimum.
- Existing electrical infrastructure to remain in place when the modular building is removed for potential future use.
- For bus circulation use a 32’ MTS bus as a template.

Exclusions:

- Schematic Level Design Criteria
- Design Development and Construction Documents
- CSI Specifications
- Mechanical Plans
- Facility Electrical Plans
- Plumbing Plans
- Fire Protection Plans
- Irrigation Plans
- Geotechnical Studies
- Value Engineering
- Agency Coordination
- Designs for improvements to existing buildings
- Designs for pre-manufactured trusses
- Shoring design
- Designs for curtain wall and exterior prefabricated systems
- Designs of non-bearing exterior metal stud framing
- Methane Barrier or venting designs

- Designs for offsite improvements including utilities
- Request and processing of utility will serve letters
- Geotechnical and Environmental consulting services
- Coordination with any agency for flight path design restrictions
- Preparation or processing of any plans or permits through any agency
- Construction staking
- Preparation of Hazardous Materials report
- Payment of any governmental fees, permits or assessments
- MTS or outside agency changes in program, schedule, Consultant team or redesign.
- Tenant Improvements
- Design Build Bidding and Construction Support
- Acoustical Engineering
- Tree report/arborist report
- CASp analysis and accessibility upgrades of existing facility NIC.
- Sustainability Certification Documentation
- Environmental Documentation
- Hydraulic analysis of existing facilities
- Services not described herein

XIII. PREVAILING WAGE

Prevailing wage rates apply to certain personnel for these services? ☑Yes ☐No

ATTACHMENT B
NEGOTIATED FEE PROPOSAL

Work Order Estimate Summary

MTS Doc. No.	**PWL355.0-22**
Work Order No.	**WOA355-AE-44**
Attachment:	**B**

Work Order Title: **CPD Modular Building Replacement Phase 1 - Program Validation**

Project No:

Table 1 - Cost Codes Summary (Costs & Hours)

Item	Cost Codes	Cost Codes Description	Total Costs
1			
2			
		Totals =	

Table 2 - TASKS/WBS Summary (Costs & Hours)

Item	TASKS/WBS	TASKS/WBS Description	Labor Hrs	Total Costs
1	Task 1	Project Management	**185.0**	**$35,577.30**
2	Task 2	Survey	**86.0**	**$14,163.70**
3	Task 3	Program Validation	**413.0**	**$73,464.20**
4				
5				
6				
7				
8				
9				
10				
		Totals =	**684.0**	**$123,205.20**

Table 3 - Consultant/Subconsultant Summary (Costs & Hours)

(If Applicable, Select One)				Consultant	Labor Hrs	Total Costs
DBE	DVBE	SBE	Other			
				Psomas	473.0	79,243.4
x		x		Anil Verma	211.0	43,961.8
				Totals =	**684.0**	**$123,205.20**

Work Order Estimate Summary

Total Hours = **473**

Total Costs = **$79,243.44**

Consultant/Subconsultant: **PSOMAS/PSOMAS**

Work Order Title: **CPD Modular Building Replacement Phase 1 - Program Validation**

MTS Doc. No.: **PWL355.0-22**

Work Order No.: **WOA355-AE-44**

Attachment: B

Item	TASKS/WBS	TASKS/WBS Description	ODCs (See Attachment)	Technical Expert	Engineer - Principal	Engineer - Senior	Task Manager	Engineer - 3	Contract Manager	Planner - Senior	Engineer - 2	Archeo - Senior	CADD-Senior	Admin-3	Surveyor-Senior	Field Technician Senior	Field Technician 3	Field Technician 2	Project Manager	Surveyor 2	Surveyor 3	Technical Expert (survey)	Total Hours	Totals
				$ 291.05	$ 255.65	$ 244.06	$ 226.58	$ 203.19	$ 183.25	$ 161.44	$ 155.89	$ 145.74	$ 135.79	$ 108.94	$ 189.19	$ 160.14	$ 133.65	$ 83.90	$ 225.30	$ 109.89	$139.95	$284.29		
1	**Task 1**	**Project Management**																						
	1.1 Invoicing, Scheduling, Progress Report and Administration				6				20					12									38	$6,506.18
	1.2 Subconsultant oversight and submittal package assembly								20		10		10										40	$6,581.80
	1.3 QA/QC					20			12		12												44	$8,950.88
	1.4 Meetings (8 bi-weekly design team meetings, 4 MTS PM/PDT, 8				4	2			10		10												26	$4,902.12
		Subtotals (Hours) =	N/A		10	22			62		32		10	12									148	$26,940.98
		Subtotals (Costs) =			$2,556.50	$5,369.32			$11,361.50		$4,988.48		$1,357.90	$1,307.28									**148**	**$26,940.98**
2	**Task 2**	**Survey**																						
	2.1 Boundary Survey and Easement Analysis		$2,500.00												2					24			26	$5,515.74
	2.2 Aerial Topographic Survey														2	16	16		2	8	16		60	$8,647.94
		Subtotals (Hours) =	N/A												4	16	16		2	32	16		86	$14,163.68
		Subtotals (Costs) =	$2,500.00												$756.76	$2,562.24	$2,138.40		$450.60	$3,516.48	$2,239.20		**86**	**$14,163.68**
3	**Task 3**	**Schematic Level (15%) Design Criteria**																						
	3.1 Data Collection and Review					2			8		4		16										30	$4,750.32
	3.2 Existing Conditions Base Map					1			16		4		40										61	$9,231.22
	3.3 Program Validation																							
	3.3.1 User Group Meetings								8		16		8										32	$5,046.56
	3.3.2 Utility Capacity Studies								40		8		20										68	$11,292.92
	3.3.3 Conceptual Stormwater Management								24		8		16										48	$7,817.76
		Subtotals (Hours) =	N/A			3			96		40		100										239	$38,138.78
		Subtotals (Costs) =				$732.18			$17,592.00		$6,235.60		$13,579.00										**239**	**$38,138.78**

Totals (Summary) =							**Totals =**								Totals =	**473**	**$79,243.44**
Total (Hours) =	N/A	10	25	158	72	110	12	4	16	16	2	32	16		473	
Total (Costs) =	$2,500.00	$2,556.50	$6,101.50	$28,953.50	$11,224.08	$14,936.90	$1,307.28	$756.76	$2,562.24	$2,138.40	$450.60	$3,516.48	$2,239.20			$79,243.44
Percentage of Total (Hours) =	N/A	2%	5%	33%	15%	0.23255814	0.02536998	0.00845666	0.03382664	0.03382664	0.00422833	0.06765328	0.033826638		100%	
Percentage of Total (Costs) =	3%	3%	8%	37%	14%	0.18849384	0.01649701	0.00954981	0.03233378	0.0269852	0.005686275	0.04437566	0.028257229			85%

Work Order Estimate Summary

Consultant/ Subconsultant: **Psomas/Psomas**

Contract No: **PWL355.0-22**

Task Order No. **WOA355-AE-44**

Work Order Title: **CPD Modular Building Replacement Program Validation and Design Criteria Services**

Attachment: B

TASKS/WBS (1-5)

ODC Item	Description	Unit	Unit Cost	Task 1		Task 2		Task 3		Task 4		Task 5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Title Report	1				1	$2,500.00						
2													
3													
4													
5													
6													
7													
8													
9													
10													
			Subtotal =			Subtotal =	**$2,500.00**	Subtotal =		Subtotal =		Subtotal =	

TASKS/WBS (6-10)

ODC Item	Description											Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Title Report											**1**	**$2,500.00**
2													
3													
4													
5													
6													
7													
8													
9													
10													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	**$2,500.00**

Work Order Estimate
Summary

Consultant/Subconsultant: **PSOMAS / ANIL VERMA AND ASSOCIATES**

MTS Doc. No.: **=Summary!G2**
Work Order No.: **=Summary!G3**

Total Hours = **211**
Total Costs = **$43,961.76**

Work Order Title: **CPD Modular Building Replacement Design Services**

Attachment: B

Item	TASKS/WBS	TASKS/WBS Description	ODCs (See Attachment)	Principal Architect	Architect - Senior (PM)	Architect-3 QA/QC	Architect - Senior (PM)	Architect-3 (Designer)	Planner-2 (Arch. CADD)	Architect - Senior (Landscape)	Planner-2 (Landscape)	Engineer-Senior (Mech)	Planner-2 (Plumbg)	Engineer-Senior (Elect)	Planner-2 (Electric)	Planner-2 (Fire Protectn)	Planner-2 (IMEP-CADD)	Planner-Senior (Estimator)	Planner-2 (Admin)				Total Hours	Totals
				$ 479.82	$ 228.05	$ 187.01	$ 228.05	$ 187.01	$ 156.14	$ 228.05	$ 156.14	$ 266.14	$ 156.14	$ 266.14	$ 156.14	$ 156.14	$ 156.14	$ 240.03	$ 156.14					
1	**Task 1**	**Project Management**																						
	1.1 Invoicing, Scheduling, Progress Report and Administration				2														6				8	$1,392.94
	1.2 Subconsultant oversight and submittal package assembly																							
	1.3 QA/QC				4																		4	$912.20
	1.4 Meetings (8 bi-weekly design team meetings, 4 MTS PM)	$670.00	1	8			10					2		3		1							25	$6,331.16
	Subtotals (Hours) =	N/A	1	14			10					2		3		1			6				37	$8,636.30
	Subtotals (Costs) =	$670.00	$479.82	$3,192.70			$1,870.10					$532.28		$798.42		$156.14			$936.84				**37**	**$8,636.30**
2	**Task 2**	**Survey and Geotechnical Engineering During Design**																						
	2.1 Boundary Survey and Easement Analysis																							
	2.2 Design Topgraphic Survey																							
	Subtotals (Hours) =	N/A																						
	Subtotals (Costs) =																							
3	**Task 3**	**Program Validation**																						
	3.1 Data Collection and Review	$585.00		6			24		16		6		4	16									72	$15,249.98
	3.2 Existing Conditions Base Map																							
	3.3 Program Validation																							
	3.3.1 User Group Meetings			8			16					4	2	8		4							42	$8,947.08
	3.3.2 Utility Capacity Studies											8	12	8	16	8							52	$9,879.28
	3.3.3 Conceptual Stormwater Management										8												8	$1,249.12
	Subtotals (Hours) =	N/A		14			40		16	8	18	14	20	32	12								174	$35,325.46
	Subtotals (Costs) =	$585.00		$3,192.70			$7,480.40		$3,648.80	$1,249.12	$4,790.52	$2,185.96	$5,322.80	$4,996.48	$1,873.68								**174**	**$35,325.46**

Totals (Summary) =								**Totals =**									Totals =	**211**	**$43,961.76**
Total (Hours) =	N/A	1	28		50		16	8	20	14	23	32	13		6			211	
Total (Costs) =		$1,255.00	$479.82	$6,385.40		$9,350.50		$3,648.80	$1,249.12	$5,322.80	$2,185.96	$6,121.22	$4,996.48	$2,029.82		$936.84			$43,961.76
Percentage of Total (Hours) =	N/A		0.47%	13.27%		23.70%		7.58%	3.79%	9.48%	6.64%	10.90%	15.17%	6.16%		0.02843602		100%	
Percentage of Total (Costs) =		3%	1.09%	14.52%		21.27%		8.30%	2.84%	12.11%	4.97%	13.92%	11.37%	4.62%		0.02131034			68%

Work Order Estimate Summary

Consultant/ Subconsultant: **Psomas/AVA**

Contract No: **PWL355.0-22**

Task Order No. **WOA355-AE-44**

Work Order Title: **CPD Modular Building Replacement Program Validation and Design Criteria Services**

Attachment: B

TASKS/WBS (1-5)

ODC Item	Description	Unit	Unit Cost	Task 1		Task 2		Task 3		Task 4		Task 5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Travel / Mileage	Miles	$0.67	1,000	$670.00			500	$335.00				
2	Reproductions	Allow	$50.00					5	$250.00				
3													
4													
5													
6													
7													
8													
9													
10													
				Subtotal =	**$670.00**	Subtotal =		Subtotal =	**$585.00**	Subtotal =		Subtotal =	

TASKS/WBS (6-10)

ODC Item	Description											Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Travel / Mileage											**1,500**	**$1,005.00**
2	Reproductions											**5**	**$250.00**
3													
4													
5													
6													
7													
8													
9													
10													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	**$1,255.00**

Metropolitan Transit System

June 26, 2025

MTS Doc. No. PWL355.0-22
Work Order No. WOA355-AE-44.01

Mrs. Sarah Curran, PE
Vice President
Psomas
401 B Street, Suite 1600
San Diego, CA 92101

Dear Mrs. Curran:

Subject: AMENDMENT NO. 1 TO WORK ORDER WOA355-AE-44 TO MTS DOC. NO. PWL355.0-22, CPD MODULAR BUILDING REPLACEMENT PHASE 2 – DESIGN CRITERIA DOCUMENT

This letter shall serve as Amendment No. 1 to our agreement for Work Order WOA355-AE-44 to MTS Doc. No. PWL355.0-22, for professional services under the General Engineering Consultant Agreement, as further described below.

SCOPE OF SERVICES

This Amendment shall provide design services for the development of the Design Criteria document for the CPD Modular Building Replacement project. Services shall be performed in accordance with the attached Scope of Services (Attachment A)

SCHEDULE

As a result of this Amendment, the Schedule for this Work Order shall be increased by twelve (12) weeks. The revised Schedule shall be for a period of twenty-four (24) weeks from the date of the Notice to Proceed.

PAYMENT

As a result of this Amendment, the Payment shall be increased by $357,356.64. The revised Payment shall be based on actual costs in the amount of $481,132.50 (Attachment B). The Work Order amount shall not be exceeded, without prior authorization of MTS.

Please sign below, and return the document to the Contracts Specialist at MTS. All other terms and conditions shall remain the same and in effect.

Sincerely,

Sharon Cooney
Chief Executive Officer

Accepted:

Sarah Curran, Vice President
Psomas

Date:

Attachments: Attachment A, Scope of Services
Attachment B, Negotiated Fee Proposal

ATTACHMENT A
SCOPE OF SERVICES

All contents of the Scope of Services below pertain exclusively to Amendment No. 1

TITLE: CPD Modular Building Replacement Phase 2 - Design Criteria **WOA #:** WOA355-AE-44.01

I. PROJECT DESCRIPTION

The San Diego Metropolitan Transit System, (referred to hereafter as "MTS") has selected Psomas to provide Consultant services for preparation of the Design Criteria package to support a design build bid for the modular building replacement at MTS's Copley Park Division (referred to hereafter as "CPD"). The proposed infrastructure is the full demolition of the existing modular building, and the construction of a new two-story structure on the south elevation of the existing administrative building. The Modular Building Replacement design criteria is to be based on the CPD Modular Building Replacement Planning Study (Planning Study) dated 12/21/23. It is anticipated the project will include the following:

- A maximization of usable interior area in the allotted footprint of the building.
- Infrastructure and programming to exceed the existing space present in the existing modular building as approved as part of the Planning Study.
- Provide for implementation with minimal disruptions to current service.
- Located south of the existing administrative building and connected via a breezeway.
- Minimal impact to existing face of building.
- Elevator and stairs located off breezeway rather than interior of new structure.
- Demolition of the existing modular building to be replaced.
- Stormwater management
- EV Charging Stations as required to comply with 2022 CalGreen
- Provisions for rooftop mounted solar panels
- Maintenance of the existing clay cap over the landfill
- After occupancy of the new building, demolition of the existing modular building and replacement with pavement/additional parking
- Large interior light pole as well as new perimeter lighting to replace multiple leaning poles within the parking lot.

The scope of work related to the Consultant Team includes the following:

- Refined site lighting concept design and electrical capability analysis
- Schematic Level (15%) Design Criteria for the proposed facility and existing site renovations including narratives, schematic level exhibits and development of performance requirements.
- Authority Having Jurisdiction (AHJ) outreach including City of San Diego, State Water Resources Control Board and
- Cost Estimating

II. SCOPE OF WORK

The scope of work shall consist of the following tasks and deliverables:

TASK 1: PROJECT MANAGEMENT

1.1 Invoicing, Scheduling, Progress Report and Administration

Consultant shall provide project management services that will include monthly progress reports, invoicing and administration of the project. As part of this task the Consultant will be responsible to maintain schedule compliance of final deliverables for this task order. Work elements include:

- Provide project management services including the requirements for invoicing, scheduling, and monthly project progress reports.
- Develop and implement a project schedule to complete the Scope of Work and manage the project to eliminate or minimize supplemental agreements.
- Prepare monthly status reports and project schedules which are to be submitted with invoices. The status report must outline all activities for which charges have been made by the Consultant or sub-Consultants. The Consultant shall prepare a draft status report and submit it for approval prior to submitting the first invoice.

OUTPUT: *Monthly invoices, progress reports, schedule updates as needed*

1.2 Subconsultant oversight and submittal package assembly

Consultant shall provide subconsultant oversight to maintain progress towards each design milestone. This includes collection of deliverables from each subconsultant and assembly into the overall submittal package to MTS. It is assumed there will be a draft and final submittal of the Design Criteria Package to MTS including one review cycle.

1.3 Quality Assurance and Quality Control

Provide QA/QC on all deliverables. To ensure quality of work and compliance with the scope of work, the Consultant shall perform a systematic in-house review of all documents produced prior to each milestone submittal. All reviewed documents shall have a check box or signature indicating a review has been performed.

1.4 Meetings

Arrange and facilitate Project Development Team (PDT) meetings, interagency meetings, field reviews, and other project-related meetings. The purpose of these meetings will be to review project status to ensure that the contract objectives and milestones are being achieved. To supplement these meetings, we will maintain on-going communications with MTS and agencies identified in this scope. Progress meetings with MTS staff will be held at monthly intervals.

Consultant shall prepare meeting agendas, meeting minutes, necessary supplemental materials, and meeting sign-in sheets for all meetings. For the purposes of this proposal, we have budgeted for:

- 4 bi-weekly PDT meetings
- 2 meetings with the MTS Project Manager and PDT
- 4 additional meetings between MTS Project Manager and Psomas

OUTPUT: *Meeting agendas and minutes, action items list, and decision log.*

TASK 2: SCHEMATIC LEVEL (15%) DESIGN CRITERIA

The development of the Design Criteria document to support a design build bid is to be based on the Program Validation documents developed during Phase 1 of this project.

2.1 Schematic Level (15%) Exhibits

Consultant shall develop and refine documents prepared as part of the Planning Study to a Schematic Level (15%) to be incorporated as exhibits into the overall Design Criteria Documents. Narratives will be provided as necessary to supplement exhibits and outline general design criteria to be used for future phases of development. Discipline specific elements include:

2.1.1 Architectural

Consultant will prepare Schematic Plan (15%) Drawings illustrating components of the Project including the size, scale, location, dimensions, and character of physical systems and equipment and will be in accordance with MTS standards, Title 24, and other applicable requirements. Consultant will develop the initial architectural styles for study by providing architectural plan and elevation sketches and comments to aid MTS staff to determine a style for the project. Through meetings in Task 1, the Consultant team will work with MTS to understand the site design objectives. Determine the constraints, opportunities, general capacities or optimum level of development.

Consultant shall prepare:

- Architectural Plans,
- Reflected Ceiling Plans
- Exterior Elevations and Facility Sections
- Architectural Renderings
- Preliminary Door and Window Schedules

2.1.2 Civil

Consultant shall develop and refine the site plan prepared as part of the program validation into a Schematic Level (15%) Site Plan for the site. Site plans shall be presented at a minimum 1”=40’ scale. Efforts include adjustments to the concept site backgrounds in AutoCAD to align with the survey documents and existing conditions base map prepared above. This task will include a detailed and dimensioned layout for the ingress/egress, vehicular flow, proposed wet and dry utilities, grading, and future improvements for the proposed building site. Demolition and work associated with the site of the existing modular building will be covered in the narrative portion of the Design Criteria only. Consultant shall prepare the following exhibits for the proposed building site:

- Site Plan
- Civil utilities (sewer, water, storm drain) plan
- Paving, Grading and Drainage plan including stormwater management

2.1.3 Structural

Consultant shall:

- Establish structural design criteria
    - develop design criteria for equipment dead loads based on equipment data and design completed as part of this work phase as well as all occupancy

loads.
    - develop wind and seismic criteria based on local, state, and/or national codes.
- Make recommendations for the basic structural systems
- Prepare framing concepts

2.1.4 Mechanical – concept exhibits are excluded. Concept intent to be provided to estimator for purposes of developing a rough order of magnitude estimate.

2.1.5 Electrical

The focus of the electrical engineering scope of work is to develop the design concepts at a sufficient level of detail to develop rough order of magnitude cost estimates. Consultant will prepare electrical analysis and design.

- Conduct site review to understand electrical project needs.
- Estimate power loads and equipment sizing.
- Provide switchboard, power breakers and lighting panels to accommodate loads.
- Provide coordination with required utility companies to assist with identifying any additional upgrades or service necessary to supply the project site related to Consultant's scope such as SDG&E for site electrical needs. Final application and drawings for procuring new electrical services not included and to be deferred to the design build phase.
- Consultant shall evaluate electrical system requirements including standby or emergency power; provisions for future electrical loads, provisions for voice/data communication systems, and wireless communication.
- Consultant shall work with structural designers to develop a complete design for both retrofitting existing perimeter lighting poles, as well as a single large interior lighting pole in accordance with the proposed design from the previously completed planning study.

2.1.6 Plumbing – concept exhibits are excluded and are deferred to the Design Build phase. Concept intent to be provided to architect to accommodate space needs, utility service needs, and to be provided to estimator for purposes of developing a rough order of magnitude estimate.

2.1.7 Landscape/Irrigation – Consultant shall prepare preliminary landscape plans for the project site and will work with MTS Landscape/Maintenance staff in order to provide a preliminary design that meets MTS's requirements.

- Preliminary Hardscape Design Intent Plans
- Preliminary Planting Legend, Tree Plan, and Planting Intent Plan
- Location of Irrigation Point of Connection and Preliminary Water Needs.

Concept intent to be provided to estimator for purposes of developing a rough order of magnitude estimate.

2.1.8 Lighting

Consultant shall prepare:

- refined site lighting plan based upon preferred scheme and refined site plan
- product cutsheets and
- updated site photometrics
- Interior lighting criteria.

Facility lighting plans are excluded and are deferred to the Design Build phase. Concept intent to

be provided to architect to accommodate layout needs, power needs, and to estimator for purposes of developing a rough order of magnitude estimate.

2.1.9 Fire Protection – concept exhibits are excluded, and design plans are deferred to the Design Build phase. Concept intent to be provided to architect to accommodate space needs, to civil for utility needs, and to estimator for purposes of developing a rough order of magnitude estimate.

2.2 General Performance Requirements

General performance requirements shall be developed to define the desired outcomes and performance criteria of the product. Major components to be highlighted for the design builder and identify the general quality of the product.

2.3 Construction Cost Estimates

Provide updated quantities and cost for the electrical, civil, structural, fire protection, and equipment components. This task includes generating new quantity takeoffs based on the more detailed concept design from all the disciplines. Produce Class 3 Opinion of Probable cost.

OUTPUT: Class 3 Opinion of Probable Cost

2.4 Design Criteria Package

Consultant will provide written programming and criteria of the explicit guidelines and requirements the project must meet to support a design build bid. Exhibits, narratives and performance requirements prepared above shall be incorporated into overall deliverable. Greenbook Standards and Specifications shall be referenced. A draft Design Criteria package will be prepared by Consultant for MTS & Stakeholder review and approval prior to final Design Criteria package submittal. Exhibits are to be developed on AutoCAD Version 2022 or equivalent and documents shall be prepared utilizing the Microsoft Office Suite (i.e. “Word,” “Excel,” “PowerPoint,” and “Project.”)

OUTPUT: Draft and Final Design Criteria Package

TASK 3: AHJ Outreach

Consultant will contact the following agencies:

3.1 City of San Diego

Consultant will prepare and submit a Multiple Discipline Preliminary Review Application to the City of San Diego Development Services Department and attend as many as one (1) follow up meeting to discuss their initial review and preparation of associated meeting minutes. Findings of the preliminary review will be incorporated into the criteria document.

3.2 Regional Water Quality Control Board (RWQCB)

Consultant will meet with the RWQCB to discuss the improvements relative to the capped landfill and prepare associated meeting minutes. Findings of the discussion will be incorporated into the criteria document.

III. PERIOD OF PERFORMANCE

This work order shall be for a period of 12 weeks from the date of the Notice to Proceed.

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IV. DELIVERABLES

The schedule of deliverables is contingent upon receiving timely comments from the City of SanDiego, MTS, and SDG&E.

1. Monthly Progress Reports
2. Meeting Minutes
3. Design Criteria Package
4. Opinion of Probable Cost

V. SCHEDULE OF SERVICES/MILESTONES/DELIVERABLES

A. Tasks Schedule

Task	Begin/End Dates
Task 1: Project Management	NTP + 12 weeks
Task 2: Schematic Level (15%) Design Criteria	NTP + 12 weeks

B. Milestones/Deliverables Schedule

Milestone/Deliverable	Due Date
Monthly Progress Reports	Monthly
Draft Design Criteria Package	NTP + 8 weeks
MTS Returned Comments	NTP + 10 weeks
Final Design Criteria Package	NTP + 12 weeks

VI. MATERIALS TO BE PROVIDED BY MTS AND/OR THE OTHER AGENCY

A. Project documentation and background reports from prior work efforts to be used as basis of design.
B. MTS to provide any Geotechnical data/reports in their possession for use in design.
C. Onsite fire flow and pressure tests
D. MTS provided all available aerial and utility / ground survey and existing as-built documents of the CPD buildings on site as part of the previous Planning Study.
E. CHSP (community health safety plan) and COP (continuing obligation plan)

VII. SPECIAL CONDITIONS

Any condition listed below applies solely to this Work Order and does not otherwise alter the Agreement or other Work Orders.

A. The project delivery method will be using the design build approach.
B. All deliverables will be provided in electronic format.
C. All stated opinion of probable cost estimates primary characteristics based on the Association for the Advancement of Cost Engineering (AACE) classification definitions.
D. Performance requirements to include request for design of solar / PV system.
E. Existing gasoline and propane tanks could be relocated onto the east property to make room for the new space but needs Fire Dept. approval.
F. Staff break area is currently under portable canopies in the southeast corner of the parking area of the west property. This could be relocated if needed.

XII. ADDITIONAL INFORMATION

List additional information as applicable to the specific Work Order scope of services.

Assumptions:

- Design Criteria Package prepared by Consultant as part of this work order will be used to support the overall design build bid package prepared by MTS.
- Proposal assumes all work to be wholly contained onsite and no provisions have been made for specification of criteria for offsite improvements. No new or replacement connections to public utilities are anticipated in this work.
- The governing code will be the 2021 IBC, 2022 CBC and related amendments.
- Conventional foundation system (spread footings at columns and continuous footings at bearing walls) is presumed to be adequate to support the proposed structure at the designated site.
- Existing structures will not require significant redesign.
- The new building/space shall be located west of the limits of the landfill limits.
- The new space needs to have at least the same square footage as the existing modular building. The existing building size is absolute minimum.
- Existing electrical infrastructure to remain in place when the modular building is removed for potential future use.
- For bus circulation use a 32’ MTS bus as a template.

Exclusions:

- Design Development and Construction Documents
- CSI Specifications
- Mechanical Plans
- Facility Electrical Plans
- Plumbing Plans
- Fire Protection Plans
- Irrigation Plans
- Geotechnical Studies
- Value Engineering
- Agency Coordination
- Designs for improvements to existing buildings
- Designs for pre-manufactured trusses
- Shoring design
- Designs for curtain wall and exterior prefabricated systems
- Designs of non-bearing exterior metal stud framing
- Methane Barrier or venting designs
- Designs for offsite improvements including utilities

- Request and processing of utility will serve letters
- Geotechnical and Environmental consulting services
- Coordination with any agency for flight path design restrictions
- Preparation or processing of any plans or permits through any agency
- Construction staking
- Preparation of Hazardous Materials report
- Payment of any governmental fees, permits or assessments
- MTS or outside agency changes in program, schedule, Consultant team or redesign.
- Tenant Improvements
- Design Build Bidding and Construction Support
- Acoustical Engineering
- Tree report/arborist report
- CASp analysis and accessibility upgrades of existing facility NIC.
- Sustainability Certification Documentation
- Environmental Documentation
- Hydraulic analysis of existing facilities
- Services not described herein

ATTACHMENT B
NEGOTIATED FEE PROPOSAL

Work Order Estimate Summary

MTS Doc. No.	**PWL355.0-22**
Work Order No.	**WOA355-AE-44.01**
Attachment:	**B**

Work Order Title: **CPD Modular Building Replacement Phase 2 - Design Criteria Document**

Project No:

Table 1 - Cost Codes Summary (Costs & Hours)

Item	Cost Codes	Cost Codes Description	Total Costs
1			
2			
		Totals =	

Table 2 - TASKS/WBS Summary (Costs & Hours)

Item	TASKS/WBS	TASKS/WBS Description	Labor Hrs	Total Costs
1	Task 1	Project Management	206.0	$ 38,248.58
2	Task 2	Schematic Level (15%) Design Criteria	1,814.0	$ 330,161.22
3	Task 3	AHJ Outreach	58.0	$ 24,792.14
4		Reallocated from Phase 1, Task 1 to Phase 2,Task 3		$ (14,000.00)
5		Rellocated from Phase 1, Task 3 to Phase 2, Task 3		$ (10,845.30)
6		Reallocated from Phase 1, Task 1 to Phase 2,Task 1		$ (4,000.00)
7		Rellocated from Phase 1, Task 3 to Phase 2, Task 1		$ (7,000.00)
8				
9				
10				
		Totals =	**2,078.0**	**$ 357,356.64**

Table 3 - Consultant/Subconsultant Summary (Costs & Hours)

(If Applicable, Select One)				Consultant	Labor Hrs	Total Costs
DBE	DVBE	SBE	Other			
				Psomas	420.0	$ 84,943.86
				Psomas - Reallocated from Phase 1		$ (35,845.30)
x		x		Anil Verma	1,488.0	$ 279,195.20
				Coffman	170.0	$ 29,062.88
				Totals =	**2,078.0**	**$ 357,356.64**

Work Order Estimate
Summary

Consultant/Subconsultant: **PSOMAS/PSOMAS**

Total Hours = **420**

Total Costs = **$84,943.86**

Work Order Title: **CPD Modular Building Replacement Phase 2 - Design Criteria Document**

Attachment: **B**

Item	TASKS/WBS	TASKS/WBS Description	ODCs (See Attachment)	Technical Expert	Engineer - Principal	Engineer - Senior	Task Manager	Engineer - 3	Contract Manager	Planner - Senior	Engineer - 2	Archeo - Senior	CADD-Senior	Admin-3	Surveyor-Senior	Field Technician Senior	Field Technician 3	Field Technician 2	Project Manager	Surveyor 2	Surveyor 3	Technical Expert (survey)	Total Hours	Totals
				$ 291.05	$ 255.65	$ 244.06	$ 226.58	$ 203.19	$ 183.25	$ 161.44	$ 155.89	$ 145.74	$ 135.79	$ 108.94	$ 189.19	$ 160.14	$ 133.65	$ 83.90	$ 225.30	$ 109.89	$139.95	$284.29		
1	**Task 1**	**Project Management**																						
	1.1 Invoicing, Scheduling, Progress Report and Administration				6				20					12									38	$6,506.18
	1.2 Subconsultant oversight and submittal package assembly								20		10		10										40	$6,581.80
	1.3 QA/QC					20			12		12												44	$8,950.88
	1.4 Meetings (8 bi-weekly design team meetings, 4 MTS PM/PDT, 8				4	2			10		10												26	$4,902.12
		Subtotals (Hours) =	N/A		10	22			62		32		10	12									148	$26,940.98
		Subtotals (Costs) =			$2,556.50	$5,369.32			$11,361.50		$4,988.48		$1,357.90	$1,307.28									**148**	**$26,940.98**
2	**Task 2**	**Schematic Level (15%) Design Criteria**																						
	2.1 Schematic Level (15%) Exhibits																							
	2.1.1 Architectural																							
	2.1.2 Civil				4	16			34		24		34										112	$19,516.28
	2.1.3 Structural																							
	2.1.4 Mechanical																							
	2.1.5 Electrical																							
	2.1.6 Plumbing																							
	2.1.7 Landscape/Irrigation																							
	2.1.8 Lighting																							
	2.1.9 Fire Protection																							
	2.2 General Performance Requirements					1			8		8												17	$2,957.18
	2.3 Construction Cost Estimates					1			24		8		24										57	$9,148.14
	2.4 Design Criteria Package				2	4					16		40										62	$9,413.38
		Subtotals (Hours) =	N/A		6	22			66		56		98										248	$41,034.98
		Subtotals (Costs) =			$1,533.90	$5,369.32			$12,094.50		$8,729.84		$13,307.42										**248**	**$41,034.98**
3	**Task 3**	**AHJ Outreach**																						
	City of San Diego		$12,280.30		2				12														14	$14,990.60
	RWQCB				2				8														10	$1,977.30
		Subtotals (Hours) =	N/A		4				20														24	$16,967.90
		Subtotals (Costs) =	$12,280.30		$1,022.60				$3,665.00														**24**	**$16,967.90**
	Totals (Summary) =													**Totals =**								Totals =	**420**	**$84,943.86**
	Total (Hours) =		N/A		20	44			148		88		108	12									420	
	Total (Costs) =		$12,280.30		$5,113.00	$10,738.64			$27,121.00		$13,718.32		$14,665.32	$1,307.28										$84,943.86
	Percentage of Total (Hours) =		N/A		5%	10%			35%		21%		0.2571429	0.0285714									100%	
	Percentage of Total (Costs) =		14%		6%	13%			32%		16%		0.1726472	0.0153899										100%

Work Order Estimate Summary

Consultant/ Subconsultant: **Psomas/Psomas**

Work Order Title: **CPD Modular Building Replacement Program Validation and Design Criteria Services**

Attachment: **B**

TASKS/WBS (1-5)

ODC Item	Description	Unit	Unit Cost	Task 1		Task 2		Task 3		Task 4		Task 5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	City of San Diego Multi-Discipline Review							1	$10,780.30				
2	City of San Diego Follow Up Meeting (budget)							1	$1,500.00				
3													
4													
5													
6													
7													
8													
9													
10													
			Subtotal =			Subtotal =		Subtotal =	**$12,280.30**	Subtotal =		Subtotal =	

TASKS/WBS (6-10)

ODC Item	Description	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Totals Quantity	Totals Total
1	City of San Diego Multi-Discipline Review											**1**	**$10,780.30**
2	City of San Diego Follow Up Meeting (budget)											**1**	**$1,500.00**
3													
4													
5													
6													
7													
8													
9													
10													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	**$12,280.30**

Work Order Estimate Summary

Consultant/Subconsultant: **PSOMAS / ANIL VERMA AND ASSOCIATES**

Total Hours = **1,488**

Total Costs = **$279,195.20**

Work Order Title: **CPD Modular Building Replacement Design Services**

Attachment: **B**

Item	TASKS/WBS	TASKS/WBS Description	ODCs (See Attachment)	Principal Architect	Architect - Senior (PM)	Architect-3 QA/QC	Architect - Senior (PM)	Architect-3 (Designer)	Planner-2 (Arch. CADD)	Architect - Senior (Landscape)	Planner-2 (Landscape)	Engineer-Senior (Mech)	Planner-2 (Plumbg)	Engineer-Senior (Elect)	Planner-2 (Electric)	Planner-2 (Fire Protectn)	Planner-2 (MEP-CADD)	Planner-Senior (Estimator)	Planner-2 (Admin)				Total Hours	Totals
				$ 479.82	$ 228.05	$ 187.01	$ 228.05	$ 187.01	$ 156.14	$ 228.05	$ 156.14	$ 266.14	$ 156.14	$ 266.14	$ 156.14	$ 156.14	$ 156.14	$ 240.03	$ 156.14					
1	**Task 1**	**Project Management**																						
	1.1 Invoicing, Scheduling, Progress Report and Administration				2														6				8	$1,392.94
	1.2 Subconsultant oversight and submittal package assembly																							
	1.3 QA/QC				4																		4	$912.20
	1.4 Meetings (8 bi-weekly design team meetings, 4 MTS PM)				8			10				2		3		1							24	$5,181.34
		Subtotals (Hours) =	N/A		14			10				2		3		1			6				36	$7,486.48
		Subtotals (Costs) =			$3,192.70			$1,870.10				$532.28		$798.42		$156.14			$936.84				**36**	**$7,486.48**
2	**Task 2**	**Schematic Level (15%) Design Criteria**																						
	2.1 Schematic Level (15%) Exhibits																							
	2.1.1 Architectural			2	4	16	20	280	240															
	2.1.2 Civil																							
	2.1.3 Structural																							
	2.1.4 Mechanical				2							20					40							
	2.1.5 Electrical				4									28	24		64							
	2.1.6 Plumbing				2								40				36							
	2.1.7 Landscape/Irrigation				2					12	30													
	2.1.8 Lighting				2									20	48		40							
	2.1.9 Fire Protection				2																			
	2.2 General Performance Requirements				4	80	20	20		16		20		24	20	12								
	2.3 Construction Cost Estimates										4							40						
	2.4 Design Criteria Package				6	20	12	100			10	16	10	16										
		Subtotals (Hours) =	N/A	2	28	116	52	400	240	28	44	56	50	88	92	12	180	40						
		Subtotals (Costs) =		$959.64	$6,385.40	$21,693.16	$11,858.60	$74,804.00	$37,473.60	$6,385.40	$6,870.16	$14,903.84	$7,807.00	$23,420.32	$14,364.88	$1,873.68	$28,105.20	$9,601.20						**1,428**	**$266,506.08**
3	**Task 3**	**AHJ Outreach**																						
	City of San Diego						4					4	4	4		4							20	$4,290.44
	RWQCB						4																4	$912.20
		Subtotals (Hours) =	N/A				8					4	4	4		4							24	$5,202.64
		Subtotals (Costs) =					$1,824.40					$1,064.56	$624.56	$1,064.56		$624.56							**24**	**$5,202.64**
	Totals (Summary) =											**Totals =**										Totals =	**1,488**	**$279,195.20**
	Total (Hours) =		N/A	2	42	116	60	410	240	28	44	62	54	95	92	17	180	40	6				60	
	Total (Costs) =			$959.64	$9,578.10	$21,693.16	$13,683.00	$76,674.10	$37,473.60	$6,385.40	$6,870.16	$16,500.68	$8,431.56	$25,283.30	$14,364.88	$2,654.38	$28,105.20	$9,601.20	$936.84					$12,689.12
	Percentage of Total (Hours) =		N/A	0.13%	2.82%	7.80%	4.03%	27.55%	16.13%	1.88%	2.96%	4.17%	3.63%	6.38%	6.18%	1.14%	12.10%	0.02688172	0.0040323				100%	
	Percentage of Total (Costs) =			0.34%	3.43%	7.77%	4.90%	27.46%	13.42%	2.29%	2.46%	5.91%	3.02%	9.06%	5.15%	0.95%	10.07%	0.034388843	0.0033555					71%

Work Order Estimate Summary

Consultant/ Subconsultant: **Psomas/AVA**

Work Order Title: **CPD Modular Building Replacement Program Validation and Design Criteria Services**

Attachment: B

TASKS/WBS (1-5)

ODC Item	Description	Unit	Unit Cost	Task 1		Task 2		Task 3		Task 4		Task 5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
			Subtotal =			Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS/WBS (6-10)

ODC Item	Description											Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	

Work Order Estimate
Summary

Total Hours = **170**

Total Costs = **$29,062.88**

Consultant/Subconsultant: **PSOMAS/COFFMAN**

Work Order Title: **CPD Modular Building Replacement Phase 2 - Design Criteria Document**

Attachment: **B**

Item	TASKS/WBS	TASKS/WBS Description	ODCs (See Attachment)	Engineer - Principal	Engineer - Senior	Engineer - 3	Engineer - 2	Engineer - 1	Designer - Senior	Designer - 3	Admin -3	Admin - 2	Admin - 1										Total Hours	Totals
				$ 297.52	$ 209.12	$ 169.14	$ 130.72	$ 123.02	$ 146.07	$ 128.39	$ 132.26	$ 89.17	$ 83.03	$ -	$ -	$ -	$ -	$ -	$ -	$ -				
1	**Task 1**	**Project Management**																						
	1.1 Invoicing, Scheduling, Progress Report and Administration										4	2	2										8	$873.44
	1.2 Subconsultant oversight and submittal package assembly																							
	1.3 QA/QC			2	2		2																6	$1,274.72
	1.4 Meetings (8 bi-weekly design team meetings, 4 MTS PM)				8																		8	$1,672.96
		Subtotals (Hours) =	N/A	2	10		2				4	2	2										22	$3,821.12
		Subtotals (Costs) =		$595.04	$2,091.20		$261.44				$529.04	$178.34	$166.06										**22**	**$3,821.12**
2	**Task 2**	**Schematic Level (15%) Design Criteria**																						
	2.1 Schematic Level (15%) Exhibits																							
	2.1.1 Architectural																							
	2.1.2 Civil																							
	2.1.3 Structural			8	10	26	10	8	40	20														
	2.1.4 Mechanical																							
	2.1.5 Electrical																							
	2.1.6 Plumbing																							
	2.1.7 Landscape/Irrigation																							
	2.1.8 Lighting																							
	2.1.9 Fire Protection																							
	2.2 General Performance Requirements				2	2	2																	
	2.3 Construction Cost Estimates																							
	2.4 Design Criteria Package			2	4	2	2																10	$2,031.24
		Subtotals (Hours) =	N/A	10	16	30	14	8	40	20													10	$2,031.24
		Subtotals (Costs) =		$2,975.20	$3,345.92	$5,074.20	$1,830.08	$984.16	$5,842.80	$2,567.80													**138**	**$22,620.16**
3	**Task 3**	**AHJ Outreach**																						
	City of San Diego			4	4																		8	$2,026.56
	RWQCB			2																			2	$595.04
		Subtotals (Hours) =	N/A	6	4																		10	$2,621.60
		Subtotals (Costs) =		$1,785.12	$836.48																		**10**	**$2,621.60**
	Totals (Summary) =													**Totals =**								Totals =	**170**	**$29,062.88**
	Total (Hours) =		N/A	18	30	30	16	8	40	20	4	2	2										42	
	Total (Costs) =			$5,355.36	$6,273.60	$5,074.20	$2,091.52	$984.16	$5,842.80	$2,567.80	$529.04	$178.34	$166.06											$8,473.96
	Percentage of Total (Hours) =		N/A	11%	18%	18%		5%	24%	12%	2%	1%	0.0117647										91%	
	Percentage of Total (Costs) =			18%	22%	17%		3%	20%	9%	2%	1%	0.0057138											93%

Work Order Estimate Summary

Consultant/ Subconsultant: **Psomas/Coffman**

Work Order Title: **CPD Modular Building Replacement Program Validation and Design Criteria Services**

Attachment: B

TASKS/WBS (1-5)

ODC Item	Description	Unit	Unit Cost	Task 1		Task 2		Task 3		Task 4		Task 5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
				Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS/WBS (6-10)

ODC Item	Description											Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	

Metropolitan Transit System

Agenda Item No. 6

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Purchase of Class E Cutaway Vehicles – Contract Award

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute MTS Doc. B0782.0-25 (in substantially the same format as Attachment A), with Model 1 Commercial Vehicles, Inc. (formerly Creative Bus Sales), for the purchase of three (3) Class E Gas Powered Cutaway Vehicles in the amount of $845,161.05.

Budget Impact

The total cost of this contract is estimated to be $845,161.05, inclusive of all applicable taxes and fees. This project will be funded by the Capital Improvement Project (CIP) 1001110101-ADA Bus Procurement.

DISCUSSION:

Rural bus service is classified as a lifeline service that connects rural communities with the San Diego urban areas. This service operates primarily within the vast rural areas of San Diego County, covering 3,240 square miles. The specific routes designated as rural lifeline service are Routes 888, 891, 892, using shorter cutaway vehicles (the type we are purchasing here), and 894, using 40-foot standard buses. Operation is limited to Monday through Friday, with no service on weekends or holidays.

The fleet for rural service consists of three gasoline-powered 33-foot cutaway vehicles and two 40-foot standard buses, all owned by MTS. Peak weekday requirements for these routes range from two to a maximum of five buses. Due to the geographical distances, buses are often parked overnight at off-site rural locations, including public works yards in Borrego Springs and Jacumba, as well as an enclosed lot at the historic Campo Depot, to help reduce deadhead miles back to the East County Division.

The existing fleet being used for Routes 888, 89,1 and 892 has reached the end of its useful life and needs to be replaced.
FTA Circular 4220.1G, Chapter V, Section 4, encourages federal grant recipients to use state and local intergovernmental agreements for procurement of property and services. MTS staff identified an intergovernmental agreement that provides Class E cutaway vehicles that meet

MTS specifications through a California State government purchasing schedule administered by the California Association of Coordinated Transportation (CalACT), RFP No. 20-01. This Purchasing Cooperative allows MTS to select vehicles from a pre-competed menu of choices from different vendors and manufacturers.

CalACT negotiates the purchasing collective on behalf of multiple agencies and can obtain pricing that cannot be obtained through single-agency procurements. This pricing is in line with prior proposals from previous procurements for Class E cutaway vehicles. Therefore, staff deem the costs to be fair and reasonable.

Therefore, staff recommend that the MTS Board of Directors authorize the CEO to execute MTS Doc. B0782.0-25 (in substantially the same format as Attachment A), with Model 1 Commercial Vehicles, Inc. (formerly Creative Bus Sales), for the purchase of three (3) Class E Gas Powered Cutaway Vehicles in the amount of $845,161.05.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachments: A. MTS Draft Agreement No. B0782.0-25
B. Cost Proposal B0782.0-25

Metropolitan Transit System

STANDARD AGREEMENT

FOR

MTS DOC. NO. B0782.0-25

PURCHASE OF THREE (3) CLASS E GAS POWERED MINIBUSES

THIS AGREEMENT is entered into this _____ day of _____, 2025 in the State of California by and between San Diego Metropolitan Transit System ("MTS"), a California public agency, and the following, hereinafter referred to as "Contractor":

Name: Model 1 Commercial Vehicles, Inc.

Address: 9225 Priority Way West Drive Ste. 300

Indianapolis IN 46240
City State Zip

Form of Business: Corporation
(Corporation, Partnership, Sole Proprietor, etc.)

Email: jspore@model1.com

Telephone: 425-293-9495

Authorized person to sign contracts Jason Spore (Name) Transit Bid Manager (Title)

Provide up to three (3) Class E Gas Powered Minibuses as specified in the proposal dated May 13, 2025 (attached as Exhibit A), and in accordance with the Standard Agreement, including Standard Conditions (Exhibit B), and Signed Forms (Exhibit C).

The contract term is for one (1) year effective July 1, 2025 through June 30, 2026.

MTS and Contractor shall agree to production and delivery schedules in writing upon execution of the Contract.

Vehicles shall be delivered to: Metropolitan Transit System (MTS)
Imperial Avenue Division (IAD)
100 16TH Street
San Diego, CA 92101

The registered owner will be: San Diego Metropolitan Transit System (MTS)
1255 Imperial Avenue, Suite 1000
San Diego, CA 92101

Payment terms shall be net 30 days from invoice date. The total cost of this contract shall not exceed $845,161.05, which includes tax, delivery, registration, and California tire fee.

SAN DIEGO METROPOLITAN TRANSIT SYSTEM	MODEL 1 COMMERICAL VEHICLES, INC.
By: _____ Sharon Cooney, Chief Executive Officer	By _____
Approved as to form:	
By: _____ Karen Landers, General Counsel	Title: _____

Creative Bus Sales
14740 Ramona Avenue
Chino, CA 91710
888.633.8380

Creative Bus Sales
7471 Reese Road
Sacramento, CA 95828
888.633.8380

CalACT MBTA RFP #20-01 - Class E - Quote Sheet

Vehicle Type:	**Class E - Starcraft Bus (Allstar XL)**	**Type of Lift:**	☑ Braun
Contact:	**JESSICA DUARTE**	**Lift Location:**	☐ Front ☑ Rear
Agency:	**SAN DIEGO MTS**	**Seat Material Level:**	**LEVEL 4 DOCKET 90**
Address:	**100 16TH STREET**	**Seat Color:**	**WINE VINYL**
City, State, Zip:	**SAN DIEGO, CA 92101**	**Flooring and Color:**	**ALTRO CHROMA TFCR27MTS GREY**
Phone:	**619.595.4908**	**Salesperson:**	**STEVE CHUNG**
E-Mail:	JESSICA.DUARTE@SDMTS.COM	**Salesperson Cell:**	**909.549.9398**
Delivery:	6 TO 9-MONTHS FROM RECEIPT OF ORDER	**Salesperson E-Mail:**	STEVEC@CREATIVEBUSSALES.COM

Quantity:	Description	Price	Ext. Price	ADA
1	Starcraft Bus - Class E - ***(Ford F550) 32.5' - Gasoline***	$161,587.00	$161,587.00	$19,435.00
.	**Published Options**			
5	1 - Freedman Foldaway Seat (double)	$2,256.00	$11,280.00	$11,280.00
1	2 - 34"-36" Freedman Flip Seat (featherweight)	$1,820.00	$1,820.00	$1,820.00
10	9 - Credit for seat delete	-$131.00	-$1,310.00	
1	21 - Raised Flat Floor (No Wheelwells)	$578.00	$578.00	$578.00
2	23 - Additional Mobility Aid position 8100's (w/tie downs and L Track)	$768.00	$1,536.00	$1,536.00
2	26 - Qstraint Deluxe (8100) credit per set of 4	-$109.00	-$218.00	$218.00
1	37 - Lift Pad Cover	$327.00	$327.00	$327.00
1	42 - 2-Way radio prep	$185.00	$185.00	
1	43 - REI PA system (4 interior, 1 exterior ADA speaker)	$501.00	$501.00	$501.00
1	58 - Telma Driveline Brake Retarder	$12,753.00	$12,753.00	
1	61 - Liquidspring Suspension	$14,061.00	$14,061.00	$14,061.00
1	73 - Sportworks bike rack (Stainless 2 Bike) APEX/ W/FAT TIRE ADAPTORS FOR BOTH BIKE POSITIONS	$3,586.00	$3,586.00	
1	75 - Roof Vent (Safefleet)	$338.00	$338.00	
1	76 - Rear Tow Hooks	$169.00	$169.00	
1	88 - Amerex Fire Suppression	$3,439.00	$3,439.00	
1	92 - Rear Backup Camera and Monitor	Standard	Standard	
1	113 - Delivery Zone 1	$872.00	$872.00	
1	120 - Diamond Farebox SV (2 vaults)	$2,616.00	$2,616.00	$2,616.00
1	133 - Stop Request System (w/ sign)	$877.00	$877.00	$877.00
.	**Non-Published Options**			
1	Chassis Keyed Alike	$458.00	$458.00	
3	Altro T36T Aluminum step edging w/yellow insert (Each)	$55.00	$55.00	
1	REDUCE TENSION ON ALTERNATOR POWER WIRES FROM EXTRA SUPPORT BASE	$55.00	$55.00	
1	ALIGN FRONT END OF BUS	$0.00	$0.00	
1	INTERIOR BUS NUMBERS CENTERED ON FRONT EDGE OF CELING	$22.00	$22.00	
1	FULL WIDTH DRIVER'S STORAGE COMPARTMENT LOCKED AND CARPETED	$649.00	$649.00	
1	EXHAUST TO EXIT STREETSIDE OF BUS TURNED DOWN 90 DEGREES FROM UNDERNEATH CHASSIS AND EXIT 6" OF BUMPER	$556.00	$556.00	
1	(2) MATCHING 750 CCA BATTERIES WITH MILITARY TERMINALS IN TRAY (NO BATTERY UNDER HOOD)	$649.00	$649.00	
1	BUS PAINT AND DECAL (VALSPAR #829r4072) TOYLAND RED	$11,881.00	$12,950.29	
1	CREDIT FOR TOOL BOX REMOVAL	-$22.00	-$22.00	
1	CREDIT FOR FIRST AID KIT AND BODY FLUID KIT	-$55.00	-$55.00	
1	LUMINATOR HORIZON SMT FRONT AND SIDE DESTINATION SIGNS	$10,295.00	$10,295.00	$10,295.00
1	ADD SLACK TO MAIN POWER CABLE AT WHEELCHAIR BASE	$55.00	$55.00	

1	FLOW THROUGH GATOR VALVE CORE CAPS / NO VALVE EXTENSIONS	$55.00	$55.00	
3	Antenna gound plane w/conduit and pull cord	$87.00	$87.00	
1	Pre-wire, BAT/IGN/GND FRONT STORAGE WITH BUSS BAR	$649.00	$649.00	
1	Pre-wire, BAT/IGN/GND Behind Driver HD	$322.00	$322.00	
1	MOVE HEATERS FOR CAD / AVL INSTALLATION BY CUSTOMER	$0.00	$0.00	
1	REMOVE OEM STEREO	$0.00	$0.00	
1	LUMINATOR CAMERA SYSTEM PER ATTACHED SPECIFICATIONS	$15,900.00	$15,900.00	
1	COMM TOWER BEHIND DRIVER PER FLOOR PLAN	$2,720.00	$2,720.00	
1	WHITE PAINTED RIMS	$382.00	$382.00	
1	WATCH YOUR STEP SIGNAGE IN STEPS (NOT DECALS)	$649.00	$649.00	
1	RUBBER TIRE FLARES	$431.00	$431.00	
1	REMOVE BACK UP SENSORS IN REAR BUMPER	-$218.00	-$237.62	
1	WHEELCHAIR LOOP COMPARTMENT UNDER FLIP SEAT	$600.00	$600.00	$600.00

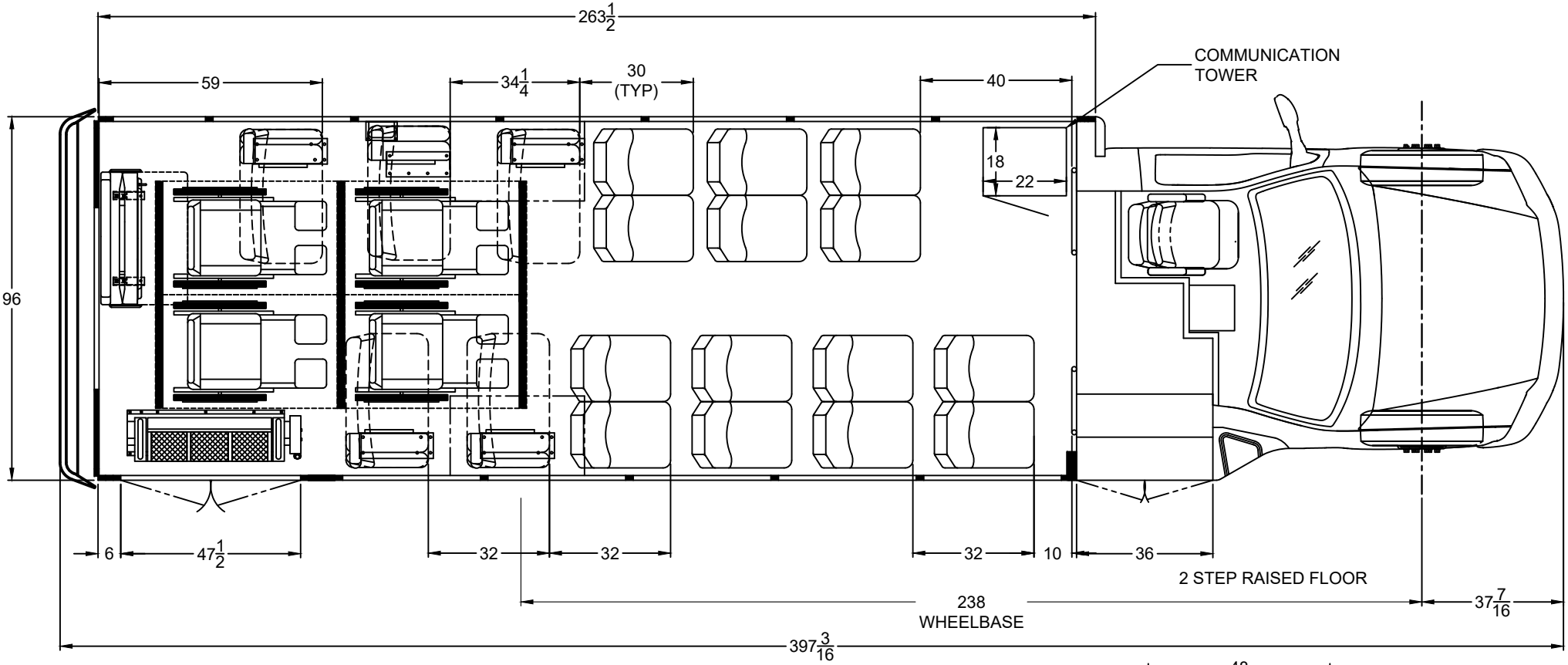
Class E - Base Price	$161,587.00	
Published Options	$53,410.00	
Non-Published Options	$47,224.67	
Total	$262,221.67	$64,144.00
Doc Prep Fee	$85.00	
Non-Taxable	$64,144.00	
Taxable Amount	$199,162.67	
Tax Total	$15,435.11	7.750%
Sub-Total	$277,741.78	
CalACT Fee	$3,933.33	
DMV E-File Fee:	$33.00	
DMV Fee	$0.00	*(Estimated)*
Tire Fee	$12.25	
Local Delivery	$0.00	
Total	**$281,720.35**	
Number of Units	3	
Final Total	**$845,161.05**	

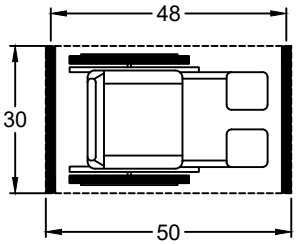
The Non-Taxable Amount is the ADA Equipment in the Base and Added as Options

The Taxable Amount Includes the Mobility Rebate of $1,000.00 For Ford Chassis

San Diego*

Purchasing of vehicles requires a CALACT membership, letter of assignment, and payment of procurement fee. If you have any questions, please contact CALACT direct at 916-920-8018. Pricing is subject to change per CalACT MBTA Purchasing Cooperative contract guidelines.





NOTE: SHOWN WITH 3PT FREEDMAN SEATS.
F-550 CHASSIS 96" WIDE
19,500 GVWR
THIS FLOOR PLAN IS FOR ILLUSTRATION PURPOSES ONLY.
A WEIGHT ANALYSIS HAS NOT YET BEEN PERFORMED.
FINAL APPROVAL WITH A WEIGHT ANALYSIS IS REQUIRED UPON RECEIPT OF A COMPLETED ORDER WITH ALL OPTIONS SHOWN.
OPTIONAL EQUIPTMENT MAY BE SHOWN.
THE SALES ORDER PLACED DICTATES ACTUAL OPTION CONTENT.

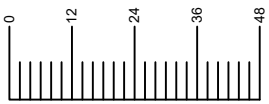
DEALER APPROVAL

☐ APPROVED

_____

CUSTOMER SIGNATURE

SCALE IN INCHES



REV. LET.	DESCRIPTION OF CHANGE	BY	CHK	DATE	ECN No.

TOLERANCE UNLESS OTHERWISE SPECIFIED

WOOD	OTHER
± 1/8"	± 1/16"
± 1°	± 1/2°

FOREST RIVER BUS

TITLE: 14 4 WC 238" WB 264" BDY MODEL 33

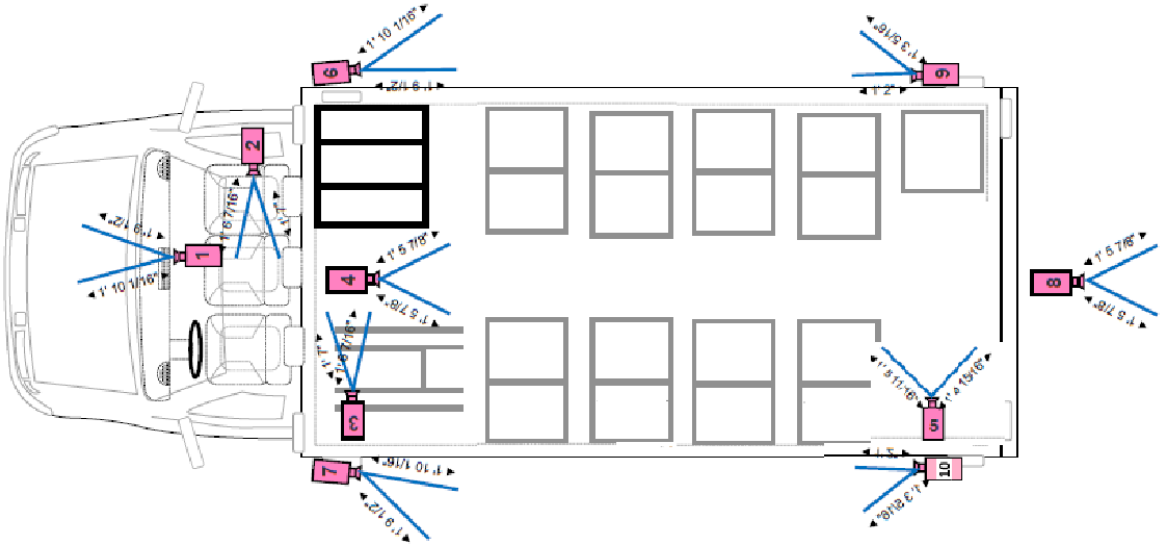
NAME: AHASHBERGER DATE: 05/15/25

DWG. No. 14 4 WC 5 DB FOLD1 DB FLIP 238 264-1 FRB

LUMINATOR CAMERA SPECIFICATIONS

Line	Qty	Model	Description
Mobile Video Equipment			
Recorder			
1	1	RRP-MDVR-24	RoadRunner Pro MDVR 12-channel AHD + 12-channel IPC (PON power supply)
2	1	RRP-MDVRSSD4S	RoadRunner Pro Solid State Drive, 4TB
3	1	RRP-Event	ROADRUNNER PRO PANIC ALARM BUTTON
4	1	009-0544-020	ROADRUNNER PRO RS485 CABLE 20 FT
5	1	009-0541-020	ROADRUNNER PRO GPIO CABLE 20 FT
6	1	RRP-MDVRGPS	RoadRunner Pro GPS Antenna
7	1	RR-UPS-B2	Uninterruptible Power Supply with Battery
8	1	009-0336-003	UPS-B2 Power Cable to RR-PRO
Cameras			
9	1	RRP-IPC-FFC-4.0	IPC Forward Facing Camera, 4.0mm
10	4	RRP-AHD-IDC-2.1	AHD Internal Dome Camera, 2.1mm
11	4	RRP-AHD-CSC-2.8	AHD Curb Side Camera, 2.8mm
12	1	RRP-AHD-BUC-2.2	AHD Backup Camera, 2.2mm
Camera Cabling			
13	1	009-0553-010	AHD AHSL CAMERA CABLE, 10 FT
14	2	009-0553-025	AHD AHSL CAMERA CABLE, 25 FT
15	4	009-0553-035	AHD AHSL CAMERA CABLE, 35 FT
16	1	009-0552-020	IPC AHSL CAMERA CABLE, 20 FT
17	1	009-0600-035	AHD Rear Camera Cabling
18	1	009-0553-045	AHD AHSL CAMERA CABLE, 45 FT

CAMERA LAYOUT (NOT TO SCALE)



*Bus photo is not to exact specifications

Class E Standard Build Options

ALLSTAR XL F550 - 96" WIDE				
FORD F-550 19,500 GVWR 7.3L Prem Gas ENGINE				
Allstar XL 32 238" WB 264" Body 7.3L Prem Gas Includes 2nd Battery, Box & Tray	ST	93097		1
SPECIAL INSTRUCTIONS OR NOTES				1
SEE BOTTOM OF ORDER FRO WARRANTY				1
Dealer to Perform 4-Wheel Alignment in California				1
Dealer to Weigh Each Bus on California Certified Scale				1
No Tow Vehicle Allowed During Delivery				1
Use 250 lbs Per Wheelchair Position				1
Parts Manual with As-built Electrical Schematics				1
All Excessories Except Lights, WC Lift & Mobile Radio (If Equipped) Are Ignition Hot				1
Wiring Harnesses Supported Every 24" Maximum				1
No Butt Connectors Allowed				1
If Driver Switch Panel is on Engine Cover, Then a Quick Disconnect is Required				1
Fast Idle: 1500 RPM on Gas - Fast Idle to Engage if Voltage Drops Below 12.5 VDC or if				1
Install Dome Light With Every Row of Seats, Including WC Position, Must Meeting 8				1
Hip-To-Knee Spacing 27" Minimum				1
Seat Track Not Extend More than 6" Past Seats				1
Undercoat Metal Skirts				1
Ground to First Step Height Shall Not Exceed 12.5" Unloaded				1
304SS Required for Entry Grabs and Ceiling Grabs				1
Ceiling Grab Rails Require Formed Elbows - No End Caps				1
AC & Heater Hoses Supported Every 24" Minimum				1
Build Front Driver Storage Compartment as Large as Possible, For Storage of Tiedown				1
Install Toolbox Next to Lift if Space Allows				1
Convex Mirror Must Avoid Sun Visor and Overhead Door				1
Headlight Aiming Certificate - Ship with Bus				1
Water Test Certificate - Ship with Bus				1
Driveline Metal Guards for Each Section of Shaft				1
All Harnesses Secured to Frame at Maximum of 24"				1
P-Clamps Added as Deemed Necessary by MBTA Inspector				1
Batteries Must Be Same Type (No Mismatch) (1 In Tray - 1 Underhood)				1
Continuous Run Battery Cables				1
Slide Blocks To Hold Batteries In Place				1
Floor Track Will Not Be Installed in Any Area not Covered by a Fixed Seat				1
Operations Manual - Covering Conversion Features as Listed				1
Parts Book, Operating Instructions, Troubleshooting Guide, Inspection & Service Guide,				1
SPECIAL BUILD ORDER				1
Driver Entry Grab Steel Reinforced Plastic - Nutsert Install	ST	99		1
(3) GROUND WIRES TO BE ZERO OUGHT GAUGE, TO BE CONTINUOUS WITHOUT	ST	99		1
Interlock on Entry Door - Must Be in Park to Operate	ST	99		1
ENTRY DOOR HEADER ACCESS PANEL DOOR MUST BE HINGED WITH 2 THUMB	ST	99		1
Battery Tray: SS Tray & Slides Per Standard Options Below. Must Extend at Least 3"	ST	99		1
Install Battery Cable Wiring Diagram Inside Battery Access Door	ST	99		1
Decal: Battery Disconnect, Emergency Use Only	ST	99		1
Stainless Steel Battery Hold-Down Hardware	ST	99		1
Add 2nd Heater Line Brass 1/4 Turn Valve	ST	99		1
Decal: "Heater Shut Off Valve" - Install On Street Side Near Valves	ST	99		1
KEYED LOCK ILO THUMB LATCH FOR ELECTRICAL CENTER DOOR	ST	99		1
5/8", 7 Ply AC Marine Grade APA Plywood Floor	ST	99		1
Upgrade Driver Plexi Barrier: Extend to Within 6" of Ceiling	ST	99		1
14 Gauge Galvanized Steel Wheelwells	ST	99		1
Dual Handles on WC Lift Doors	ST	99		1
Laminated Modesty Panel, Grey Melamine, Each	ST	99		2
Intermotive Break Out Box	ST	99		1
GENERIC PARTS MANUAL ON FLASH DRIVE	ST	99		1
ELECTRICAL SYSTEM				
Intermotive Flex Tech Electrical System	05	**STD**		1
SIDEWALL / REARWALL / CEILING				
Sidewall: Grey FRP	05	**STD**		1
Driver Area: Grey Padded Vinyl	05	**STD**		1
FRP on Ceiling, Grey	05	22000		1
FRP on Rearwall, Grey	05	22001		1
Cove Colored Flooring on Sidewall to Seat Track	05	22005		1
FLOORING				
Altro Meta Storm	05	22014		1
Yellow Step Nosing per Step	05	22016		4
Standard Floor 2 Step Entry with Extra Step Behind Driver (F550 only)	05	STD		1
CHASSIS				

HEAVY DUTY DRIVER RUNNING BOARD ** F-550 ONLY	05	22503		1
Romeo Rim Rear Bumper w/HawkEye RAS Installed	05	22035		1
Valve Stem Extender Inner Dual Rear Wheel, pair	05	22040		1
ENVIRONMENTAL CONTROL				
TRANS/AIR INTERNATIONAL A/C OPTIONS NOTE: CHECK THE CHASSIS/BODY COMBINATION FOR THE MODEL BEING ORDERED ABOVE FOR THE PROPER ENGINE KIT				
ENVIRONMENTAL CONTROL * NO TIE IN SYSTEMS ALLOWED BY INTERNATIONAL				
DOES THE ENGINE HAVE AN AIR PUMP? YOU MUST ENTER YES OR NO FOR PROPER ENGINE KIT!!!!				
TA SUPER 13 80K SYSTEMS 13 CID COMPRESSOR CHOOSE SINGLE TALL SKIRT OR ROOF MOUNT CONDENSER				
TA774C SUPER 13 TA77 EVAP SC4 TALL COND 13 CID COMP	05	22058		1
HEATERS				
Hot Water Heater, 65K BTU - Floor Mounted	05	20083		1
MISCELLANEOUS				
Silicone Heater Hose (for rear unit) w/full ring clamps	05	22076		1
ELECTRICAL				
Stainless Steel Battery Box & Tray	05	22089		1
Rotary Disconnect Switch	05	22092		1
Laminated Wiring Schematic ***AS BUILT*** ON ELECTRICAL PANEL DOOR	05	22101		1
EXTERIOR LIGHTS				
Surface Mount LED Entry Door Exterior Light - STD Choose Optional Below or Special builds	05	STD		1
LED Rear Center Mount Brake Light, **Rectangular**	05	20136		1
LED Mid-Ship Turn / Marker Lights REQUIRED 30' AND LONGER	05	20138		1
Independent **RED** Brake & **AMBER** Turn Signal Lights (per NJ specs)	05	20139		1
INTERIOR LIGHTS				
Additional Interior Lights (LED If Option Selected) Each	05	8041		3
AUDIO / VISUAL				
FORD F550 OEM AM/FM RADIO W/AUX INPUT AND CLOCK (F550 RADIO CAN'T BE REMOVED) - ORDERED ON CHASSIS		**NOTE**		1
4 Speakers with Wire to Chassis OEM Radio (If Supplied)	05	20159		1
DOORS / HATCH / WINDOWS				
Required: please select one passenger door option.				
Passenger Door Electric (Standard)	05	STD		1
Passenger Door 36" (Standard)	05	2063		1
Exterior Passenger Entrance Door Key	05	8133		1
Solid Window(s) EACH Replace T-Slide(s) Enter Specific Instructions in Row Below	05	20187		1
STREET SIDE REAR				1
INTERIOR				
Driver Coat Hook	05	8769		1
LUGGAGE RACK / STORAGE				
Driver Storage in Cab Overhead with Lock	05	20192		1
PARATRANSIT OPTIONS				
Double W.C. Doors w/ Windows, LED Interior Lights, Leaf Spring, LED Exterior Lighting	05	20206		1
4" Grommet Mount LED is STD. Use Special Builds for Optional Choices				1
IS THE LIFT IN THE FRONT OR REAR OF THE UNIT?				1
Braun Century NCL917-2 800# Lift (33"x51")	05	8744		1
LIFT INTERLOCK				
Fast Idle w/Interlock - Intermotive GTWY508-F FORD F550 / F650 GAS	05	99		1
Q Straint W.C. Securement Kits, Accessories				
Q10007 - 4 QRT 360 Retractr Tie Down L track & Q8-6326-A1 Comb-Lap/Shldr	05	8826		2
Q5-7580-4 18" Blue Webbing Loops	05	20250		8
Q5-6327 84" Postural Belt with Padding - Black Webbing	05	20251		1
Q-Straint Belt Cutter (ship loose)	05	8179		1
SAFETY OPTIONS				
10 Lb Fire Extinguisher	05	8616		1
Body Fluid Kit	05	20264		1
Emergency Triangle Kit	05	8091		1
Back-Up Alarm SAE Type B 107 db(A) Ecco 575	05	2880		1
STANDARD ROSCO STSK4750 BACK-UP CAMERA SYSTEM W/ 7" REARVIEW MONITOR / MIRROR COMBO	**05**	**STD**		**1**
Interior Convex Mirror 6" x 9"	05	20276		1
Red Light Over Emergency Exit Ea: **ON:** **SIDE & REAR EGRESS WINDOWS**	05	8155		5
Yellow "Standee" Line	05	8802		1
GRAB RAIL / STANCHION / PANELS				

Ceiling Grab Rail - Install on **Both Sides**		05	99		1
Left Hand Entry Vertical Grab Rail - 1 1/4"			**STD**		1
1 1/4" Grab Rail Parallel to Entrance Steps (both sides)		05	8130		1
Stanchion and Modesty Panel at Entry Door			**STD**		1
Stanchion and Modesty Panel Behind Driver		05	20301		1
Add Tinted Plexiglass Upper Panel	**LOCATION:**	05	8146		1
SEATING - DRIVER					1
FORD F-550 DRIVER SEATING					1
Ford F-550 OEM Driver's Seat - Order On Chassis			**NOTE**		1
SEATING - PASSENGER					
STD RIGID SEATS					
Mid High Double Seat		05	8067		12
PASSENGER SEAT FABRICS					
EUROPEAN OR AMERICAN WOOL QUOTED AT TIME OF ORDER!!!!					
Seat Cover - Level 4 Ice Pinstripe; Mor-Care; Leathermate		05	2074		24
SEAT OPTIONS					
Anti-Vandal Grab Handle, Black Ea **on:**	**ALL SEATS EXCEPT AGAINST REAR WALL**	05	2311		24
Black US Armrest - Each - **on:**	**AISLE**	05	2077		12
Flame Block Material on Underside of Seat (each)		05	2884		24
SEAT BELTS					
Seat Belt, Freedman USR Retractable (Per Person)		05	2282		24
Seat Belt Extension, 12" (P/N 56410) FOR USR SEAT BELTS		05	8771		2

SUMMARY OF STANDARD WARRANTIES

(Provide complete warranty information and parchment with proposal)

Warranty	Miles	Years	Warranty Details
Body Structure	100,000	5	See attached Warranty Info
Chassis	36,000	3	See attached Warranty Info
Engine	60,000	5	See attached Warranty Info
Transmission	60,000	5	See attached Warranty Info
Air conditioner	Unlimited	2	See attached Warranty Info
Lift/Ramp	Unlimited	5	See attached Warranty Info
EV Battery	N/A	N/A	N/A
EV Conversion/Installation	N/A	N/A	N/A
CNG Warranty (Install and tanks)	N/A	N/A	N/A

Metropolitan Transit System

Agenda Item No. 7

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Iris Rapid Transit Center East and Bus Stops Construction Management Services (CM) – Work Order Amendment

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute Work Order No. WOA2498-CM19.01 under MTS Doc. No. G2498.0-21 (in substantially the same format as Attachment A), with Kleinfelder Construction Services, Inc. (KCS), in the amount of $605,895.93 for additional construction management services for the Iris Rapid Transit Center East and Bus Stops Construction Project.

Budget Impact

The total cost of this amendment is estimated to be $605,895.93, and the total contract cost is estimated to be $1,506,406.06. The project is funded by the Capital Improvement Program (CIP) account 1009113001– Iris Rapid – Route & Stations Infrastructure and CIP account 1006114201 -Iris Rapid Transit Center East Island Modification.

DISCUSSION:

On April 25, 2024 (Agenda Item (AI) 13), the MTS Board approved a construction contract with Hazard Construction Engineering LLC (Hazard Construction) for the Iris Rapid Transit Center East and Bus Stops Construction. The construction consists of modifications to Iris Rapid Transit Center East bus bay, bus stop upgrades including shelters, benches, and Variable Message Signs (VMS), and a new traffic signal at 30th and Coronado to improve bus route efficiency. These improvements will support the Iris Rapid service, also known as Rapid Route 227, which started operating on October 15, 2023. The route operates at 7.5-min headways in the peak hours, with buses from the MTS South Bay Maintenance Facility (SBMF) on Main Street in Chula Vista.

In conjunction with the construction contract award, at the same meeting on April 25, 2024 (AI 15), the MTS Board of Directors authorized an agreement with KCS to provide construction management services for Iris Rapid Transit Center East and Bus Stops Construction Project. Construction management services are needed to assist MTS staff with the coordination,

control, and oversight of the project from beginning of the work through completion and closeout.
The Iris Rapid Transit Center East and Bus Stops Construction project is currently in construction and has experienced several delays including, but not limited to, manufacturer delays, design changes, and City requested construction changes that has pushed the completion date of the project. Today's proposed action would authorize additional funding to maintain sufficient construction management services throughout the expanded project timeline.

Under the proposed work order Amendment 1, KCS will continue to provide construction management services to augment MTS staff and provide oversight of the construction contractor. KCS will extend their construction management services as necessary to meet the revised completion date including resident engineering, field inspection, office engineering, project scheduling analysis, geotechnical testing and observations, hazardous materials testing, quality assurance source and field inspections to ensure the project is safely and successfully completed.

The Work Order and Amendment totals are summarized below:

Work Order No.	Purpose	Amount	Board Approval Date
WOA2498-CM19	Original Work Order for the Iris Rapid Route construction management services.	$900,510.13	4/25/24 (AI 15)
WOA2498-CM19.01	Provide additional construction management services due to project delays.	$605,895.93	Today's proposed action
	TOTAL	**$1,506,406.06**	

KCS' initial proposed amount for the additional services was $699,696.57. Through negotiations, staff was able to reduce this amount by $98,977.05, resulting in a ~14% savings to MTS. The final cost of WOA2498-CM19.01 is $605,895.93. Based on the level of effort and proposed classifications, KCS' final cost proposal was determined to be fair and reasonable. As further described at Attachment A, KCS has designated the following subcontractors for this work order: CA Wehsener Engineering, a Small Business (SB) in the amount of $33,643.68 and ZT Consulting, a SB, in the amount of $5,979.86.

Therefore, staff recommend that the MTS Board authorize the CEO to execute Work Order No. WOA2498-CM19.01 under MTS Doc. No. G2498.0-21 (in substantially the same format as Attachment A), with KCS, in the amount of $605,895.93 for additional construction management services for the Iris Rapid Transit Center East and Bus Stops Construction Project.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. Draft Work Order Amendment WOA2498-CM19.01

Metropolitan Transit System

June 26, 2025

MTS Doc. No. G2498.0-21
Work Order No. WOA2498-CM19.01

Marc Mcintyre
Project/Task Order Manager
Kleinfelder Construction Services, Inc.
5761 Copley Drive Ste.100
San Diego, CA 92101

Dear Mr. Mcintyre:

Subject: AMENDMENT NO. 1 TO WOA2498-CM19 TO MTS DOC. NO. G2498.0-21, CONSTRUCTION MANAGEMENT (CM) SERVICES WORK ORDER AGREEMENT FOR IRIS RAPID TRANSIT CENTER EAST AND BUS STOPS PROJECT

This letter shall serve as Amendment No. 1 to our agreement WOA2498-CM19 to MTS Doc. No. G2498.0-21, for Construction Management services under the Construction Management Consultant Agreement, as further described below.

SCOPE OF SERVICES

There shall be no change to the Scope of Services as a result of this Amendment. This Amendment adds funds for construction management services for the Iris Rapid Transit Center East and Bus Stops project, in accordance.

SCHEDULE

As a result of this Amendment, the Schedule shall be increased by three hundred eleven (311) calendar days from the issuance of the Notice to Proceed to the construction contractor. The revised period of performance shall be for six hundred seventy-one (671) calendar days.

The Schedule shall follow contract PWB380.0-24, Iris Rapid Transit Center East and Bus Stops Construction with Hazard Construction Engineering, LLC.

PAYMENT

As a result of this Amendment, the Payment shall be increased by $605,895.93 (Attachment A). The revised Payment shall be in the amount of $1,506,406.06. Payment shall be based on actual costs and shall not be exceeded without prior written authorization of MTS.

Please sign below, and return the document to the Contracts Specialist at MTS. All other terms and conditions shall remain the same and in effect.

Sincerely,

Sharon Cooney
Chief Executive Officer

Accepted:

Mark Mcintyre, Project/Task Order Manager
Kleinfelder Construction Services, Inc.

Date:

Attachments: A, Negotiated Fee Proposal

ATTACHMENT A
NEGOTIATED FEE PROPOSAL

Work Order Estimate Summary

MTS Doc. No.	**G2498.0-21**
Work Order No.	**WOA2498-CM19.01**
Attachment:	**B**

Work Order Title: **Iris Rapid Bus Stops and Transit Center East Construction Management Services**

Project No: **WOA2498-CM19.01**

Table 1 - Cost Codes Summary (Costs & Hours)

Item	Cost Codes	Cost Codes Description	Total Costs
1	0270	Construction Management and Inspection Services	$605,895.93
		Totals =	**$605,895.93**

Table 2 - TASKS/WBS Summary (Costs & Hours)

Item	TASKS/WBS	TASKS/WBS Description	Labor Hrs	Total Costs
1	1	PROJECT/WORK ORDER MANAGER		
2	2	PRE-CONSTRUCTION SERVICES		
3	3	CONSTRUCTION PHASE SERVICES	3,192	$605,895.93
		Totals =	**3,192**	**$605,895.93**

Table 3 - Consultant/Subconsultant Summary (Costs & Hours)

(If Applicable, Select One)				Consultant	Labor Hrs	Total Costs
DBE	DVBE	SBE	Other			
			X	Kleinfelder - Construction Services	2,971	$566,272.39
			X	Kleinfelder		
		X		CA Wehsener Engineering	192.0	$33,643.68
			X	ZT Consulting	28.9	$5,979.86
			X	TRC Engineers		
				Totals =	**3,192**	**$605,895.93**

Work Order Estimate Summary

Consultant/Subconsultant: **Kleinfelder Construction Services**

Total Hours = **2,971**

Total Costs = **$566,272.39**

Task Order Title: **Iris Rapid Bus Stops and Transit Center East Construction Management Services**

Item	label	TASKS/WBS Description	ODCs	Hank Gentile Contract Manager 24/25 $303.24	Michalle Beringhaus Task Order Manager 24/25 $223.14	Taylor Wilson Project Controls II 24/25 $108.19	Crabtree, Rex Inspector - PW Grp 2 $182.35	Gonzalez, Shannon Engineer II 24/25 $156.20	Mustafa, Hassan Engineer, Supervising 24/25 $247.93	Plotnikiewicz, Mark Scheduler, Technical Expert 24/25 $240.78	Hank Gentile Contract Manager 25/26 $315.97	Michalle Beringhaus Task Order Manager 25/26 $232.51	Taylor Wilson Project Controls II 25/26 $112.73	Gonzalez, Shannon Engineer II 25/26 $162.76	Mustafa, Hassan Engineer, Supervising 25/26 $258.35	Plotnikiewicz, Mark Scheduler, Technical Expert 25/26 $250.89	Total Hours	Totals
2.0	0270	Construction Management and Inspection Services																
2.1.1		Resident Engineering							96						317		413	$105,697.12
2.1.2.1		Field Inspection services for the following construction disciplines: Civil					1480										1,480	$269,878.00
2.1.3		Office Engineering						160						918			1,078	$174,405.68
		Total ODCs for this task	$16,291.59															$16,291.59
		Subtotals (Hours) =	N/A				1480	160	96					918	317		2,971	$566,272.39
		Subtotals (Costs) =	$16,291.59				$269,878.00	$24,992.00	$23,801.28					$149,413.68	$81,895.84		**2,971**	**$566,272.39**
																Totals =	**2,971**	**$566,272.39**
		Totals (Summary) =																
		Total (Hours) =	N/A				1,480	160	96					918	317		2,971	
		Total (Costs) =	$16,291.59				$269,878.00	$24,992.00	$23,801.28					$149,413.68	$81,895.84			$566,272.39
		Percentage of Total (Hours) =	N/A				49.8%	5.4%	3.2%					30.9%	10.7%		100.0%	
		Percentage of Total (Costs) =	2.9%				47.7%	4.4%	4.2%					26.4%	14.5%			100.0%

Actual hours to be billed at SANDAG approved Master Billing Rates

Work Order Estimate Summary

Consultant/ Subconsultant: **Kleinfelder Construction Services**

Task Order Title: **Iris Rapid Bus Stops and Transit Center East Construction Management Services**

TASKS (1-5)

ODC Item	Description	Unit	Unit Cost	1		2		3		4		5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Field Vehicle - Rex Crabtree, Hassan Mustafa	Hours/Total Working Hours Per Month	$1,377.00			11.83	$16,291.59						
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
			Subtotal =			Subtotal =	**$16,291.59**	Subtotal =		Subtotal =		Subtotal =	

TASKS (6-10)

ODC Item	Description	6		7		8		9		10		Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Field Vehicle - Rex Crabtree, Hassan Mustafa											**11.83**	**$16,291.59**
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	**$16,291.59**

NOTE: All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide. Monthly vehicle rates to be prorated by actual hours worked by employee assigned to vehicle.

Work Order Estimate Summary

Total Hours = 192
Total Costs = $33,643.68

Consultant/Subconsultant: **CA Wehsener Engineering**

Task Order Title: **Iris Rapid Bus Stops and Transit Center East Construction Manag**

Item	label	TASKS/WBS Description	ODCs	Wehsener, Chuck Engineering, Supervisor 24/25 $239.26	Wehsener, Tom QA/QC Associate 24/25 $168.84	Wehsener, Chuck Engineering, Supervisor 25/26 $249.31	Wehsener, Tom QA/QC Associate 25/26 $175.93				Total Hours	Totals	Percent of Total Hours	Percent of Total Costs
2.0	0270	Construction Management and Inspection Services												
2.1.2.2		Field Inspection services for the following construction disciplines: Electrical			20		172				192	$33,643.68		
		Total ODCs for this task												
		Subtotals (Hours) =	N/A		20		172				192	$33,643.68		
		Subtotals (Costs) =			$3,376.80		$30,266.88				**192**	**$33,643.68**	100.0%	100.0%
										Totals =	**192**	**$33,643.68**		
		Totals (Summary) =												
		Total (Hours) =	N/A		20		172				192			
		Total (Costs) =			$3,376.80		$30,266.88					$33,643.68		
		Percentage of Total (Hours) =	N/A		10.4%		89.6%				100.0%			
		Percentage of Total (Costs) =			10.0%		90.0%					100.0%		

Actual hours to be billed at SANDAG approved Master Billing Rates

Work Order Estimate Summary

Consultant/ Subconsultant: **Kleinfelder, Inc.**

Task Order Title: **Iris Rapid Bus Stops and Transit Center East Construction Management Services**

TASKS (1-5)

ODC Item	Description	Unit	Unit Cost	1		2		3		4		5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
			Subtotal =			Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS (6-10)

ODC Item	Description	6		7		8		9		10		Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	

NOTE: All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide. Monthly vehicle rates to be prorated by actual hours worked by employee assigned to vehicle.

Work Order Estimate Summary

Total Hours = 29
Total Costs = $5,979.86

Consultant/Subconsultant: **ZT Consulting**

Task Order Title: **Iris Rapid Bus Stops and Transit Center East Construction Management Services**

Item	label	TASKS/WBS Description	ODCs	Tasbihgoo, Farzad Engineer, Senior 24/25 $200.33	Soria, Andrew Technical Expert 24/25 $200.33	Tasbihgoo, Farzad Engineer, Senior 25/26 $208.74	Soria, Andrew Technical Expert 25/26 $208.74									Total Hours	Totals	Percent of Total Hours	Percent of Total Costs
2.0	0270	Construction Management and Inspection Services																	
2.1.7.4	QA CWI/NDT inspections (intermittent)			2	4	6	17									29	$5,979.86		
	Total ODCs for this task																		
		Subtotals (Hours) =	N/A	2	4	6	17									29	$5,979.86		
		Subtotals (Costs) =		$400.66	$801.32	$1,252.44	$3,525.44									**29**	**$5,979.86**	100.0%	100.0%

Totals = **29** **$5,979.86**

Totals (Summary) =

Total (Hours) =	N/A	2	4	6	17									29		
Total (Costs) =		$400.66	$801.32	$1,252.44	$3,525.44										$5,979.86	
Percentage of Total (Hours) =	N/A	6.9%	13.8%	20.8%	58.5%									100.0%		
Percentage of Total (Costs) =		6.7%	13.4%	20.9%	59.0%										100.0%	

Actual hours to be billed at SANDAG approved Master Billing Rates

Work Order Estimate
Summary

Consultant/ Subconsultant: **ZT Consulting**

Task Order Title: **Iris Rapid Bus Stops and Transit Center East Construction Management Services**

TASKS (1-5)

ODC Item	Description	Unit	Unit Cost	1		2		3		4		5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
			Subtotal =			Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS (6-10)

ODC Item	Description	6		7		8		9		10		Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	

NOTE: All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide. Monthly vehicle rates to be prorated by actual hours worked by employee assigned to vehicle.

Metropolitan Transit System

Agenda Item No. 8

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

California Department of Transportation (Caltrans) Program of Projects for Federal Fiscal Year (FFY) 2025 Federal Transit Administration (FTA) Section 5311 Formula Funding

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors approve Resolution No. 25-05 (Attachment A), authorizing the use of and application for $220,483.00 of FFY 2025 Section 5311 funds for operating assistance in rural areas.

Budget Impact

If awarded, MTS will receive FFY 2025 Section 5311 funds in the amount of $220,483.00 for Fiscal Year (FY) 2026 operating assistance. The 5311 program has a 44.67% match requirement. MTS will be required to provide minimum matching funds in the amount of $273,099.00.

DISCUSSION:

The Federal Transit Administration (FTA) provides funding for capital and operating assistance to agencies providing rural transportation through the Section 5311 Non-Urbanized Area Formula Program. These funds do not come directly to the region but are apportioned to the states. In turn, Caltrans, on behalf of the State of California, reapportions the funds to the region based solely on the regional rural population as a share of the state total rural population. San Diego Association of Governments (SANDAG) allocates the region's funds to both North County Transit District (NCTD) and MTS based on the relative rural population in each service area.

MTS's apportionment of FFY 2025 Section 5311 funds is $445,340. Of this amount, $220,483.00 will be used for FY 2026 rural operations of Routes 838, 888, 891, and 892.

Caltrans requires the submission of a resolution adopted by the MTS Board of Directors authorizing the submission of a grant application and project programming. Staff has also requested SANDAG to certify that it will amend the Regional Transportation Improvement Program (RTIP) in the event of a grant award, as per Caltrans requirements.

Therefore, staff recommends that the MTS Board of Directors approve Resolution No. 25-05 (Attachment A), authorizing the use of and application for $220,483.00 of FFY 2025 Section 5311 funds for operating assistance in rural areas.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. Board Resolution 25-05

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

Resolution No. 25-05

Resolution Authorizing Federal Funding Under FTA Section 5311(49 U.S.C. Section 5311) with the California Department of Transportation

WHEREAS, the U.S. Department of Transportation is authorized to make grants to states through the Federal Transit Administration (FTA) to support capital and operating assistance projects for nonurbanized public transit services under Section 5311 of the Federal Transit Act (FTA C 9040.1F and FTA C 9050.1); and

WHEREAS, the California Department of Transportation has been designated by the Governor of the State of California to administer Section 5311 grants for transportation projects for the general public for the rural transit and intercity bus; and

WHEREAS, the San Diego Metropolitan Transit System (MTS) desires to apply for said financial assistance to operate rural transit service and support capital improvements in San Diego County; and

WHEREAS, MTS has, to the maximum extent feasible, coordinated and consulted with other transportation providers and users in the region (including social service agencies);

NOW, THEREFORE, BE IT RESOLVED, DETERMINED, AND ORDERED that MTS does hereby authorize the Chief Executive Officer, or designated representative, to file and execute any actions necessary on behalf of MTS with the California Department of Transportation to aid in the financing of operating or capital assistance projects pursuant to Section 5311 of the Federal Transit Act (FTA C 9040.1F and FTA C 9050.1), as amended;

1. The Chief Executive Officer is authorized to execute and file all certification of assurances, contracts or agreements or any other document required by the Department.

2. The Chief Executive Officer is to provide additional information as the Department may require in connection with the application for the Section 5311 projects.

3. The Chief Executive Officer is authorized to submit and approve request for reimbursement of funds from the Department for the Section 5311 project(s).

PASSED AND ADOPTED, by the Board of Directors this 26th day of June 2025, by the following vote:

AYES:

NAYS:

ABSENT:

ABSTAINING:

Chairperson
San Diego Metropolitan Transit System

Filed by:

Clerk of the Board
San Diego Metropolitan Transit System

Approved as to form:

Office of the General Counsel
San Diego Metropolitan Transit System

Metropolitan Transit System

Agenda Item No. 9

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

California Department of Transportation (Caltrans) Program of Projects for Federal Fiscal Year (FFY) 2025 Federal Transit Administration (FTA) Intercity Bus Program 5311(f) - Competitive Funding

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors approve Resolution No. 25-06 (Attachment A), authorizing the use of and application for $300,000.00 of FFY 2025 Section 5311(f) – Competitive funding for operating assistance in non-urbanized areas.

Budget Impact

If awarded, MTS will receive FFY 2025 Section 5311(f) funds in the amount of $300,000.00 for operating assistance. The 5311(f) has a 44.67% match requirement. MTS will be required to provide minimum matching funds in the amount of $433,215.84.

DISCUSSION:

Caltrans administers a statewide competitive grant program wherein transit agencies and non-profit organizations are eligible to apply for up to $300,000.00 in financial assistance for operations serving areas outside of the federally defined urban boundary. Eligible projects can include existing operations, new services, or service expansion. However, projects must be consistent with the state-adopted objectives and meet federal certifications and assurance guidelines. MTS already meets the federal guidelines as an eligible recipient of other federal funds.

MTS is requesting the full eligible amount of $300,000 in FFY 2025 Section 5311(f) funds to support the operation of Intercity Route 894 during Fiscal Year (FY) 2026.

Caltrans requires the submission of a resolution adopted by the MTS Board of Directors authorizing the submission of a grant application and project programming. Staff has also requested the San Diego Associations of Governments (SANDAG) to certify that it will amend the

Regional Transportation Improvement Program (RTIP) in the event of a grant award, as per Caltrans requirements.

Therefore, staff recommends that the MTS Board of Directors approve Resolution No. 25-06 (Attachment A), authorizing the use of and application for $300,000.00 of FFY 2025 Section 5311(f) – Competitive funding for operating assistance in non-urbanized areas.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.tuer@sdmts.com

Attachment: A. Board Resolution 25-06

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

Resolution No. 25-06

Resolution Authorizing Federal Funding Under FTA Section 5311(f)
with the California Department of Transportation

WHEREAS, the U.S. Department of Transportation is authorized to make grants to states through the Federal Transit Administration (FTA) to support capital and operating assistance projects for nonurbanized public transit services under Section 5311(f) of the Federal Transit Act (FTA C 9040.1F and FTA C 9050.1); and

WHEREAS, the California Department of Transportation has been designated by the Governor of the State of California to administer Section 5311(f) grants for transportation projects for the general public and for rural transit and intercity bus; and

WHEREAS, San Diego Metropolitan Transit System (MTS) desires to apply for said financial assistance to operate rural transit service in San Diego County; and

WHEREAS, MTS has, to the maximum extent feasible, coordinated and consulted with other transportation providers and users in the region (including social service agencies).

NOW, THEREFORE, BE IT RESOLVED, DETERMINED, AND ORDERED that MTS does hereby authorize the Chief Executive Officer, or designated representative, to file and execute any actions necessary on behalf of MTS with the California Department of Transportation to aid in the financing of operating or capital assistance projects pursuant to Section 5311 of the Federal Transit Act (FTA C 9040.1F and FTA C 9050.1), as amended;

1. The Chief Executive Officer is authorized to execute and file all certification of assurances, contracts or agreements or any other document required by the Department.

2. The Chief Executive Officer is to provide additional information as the Department may require in connection with the application for the Section 5311 projects.

3. The Chief Executive Officer is authorized to submit and approve request for reimbursement of funds from the Department for the Section 5311 project(s).

PASSED AND ADOPTED, by the Board of Directors this 26th day of June, 2025 by the following vote:

AYES:

NAYS:

ABSENT:

ABSTAINING:

Chairperson
San Diego Metropolitan Transit System

Filed by:

Clerk of the Board
San Diego Metropolitan Transit System

Approved as to form:

Office of the General Counsel
San Diego Metropolitan Transit System

Metropolitan Transit System

Agenda Item No. 10

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Darktrace Cybersecurity Software - Contract Amendment

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute Amendment No. 5 to MTS Doc. No. G2386.0-20 (in substantially the same format as Attachment A), with Darktrace Limited (Darktrace), for Cyber Security Software Licensing in the amount of $283,426.00 for a 12-month contract time extension. (Attachment A).

Budget Impact

The total cost of the amendment is estimated to be $283,426.00, and the total contract cost of the services is estimated to be $1,243,170.00. The services will be funded by the Information Technology (IT) Operating Budget account 662010-571250.

The project costs are summarized below:

Document Name	Description	Total Budget Amount	Board Approval
Original Agreement	Cyber Security Software	$486,000.00	AI17, 5/14/20
Amendment 1	Add Cyber Security EIS Licensing	$87,700.00	Within CEO authority
Amendment 2	Add Cyber Security EIS Licensing	$278,259.00	AI14,10/14/21
Amendment 3	Cloud Transition- Add Users	$67,785.00	Within CEO authority
Amendment 4	365 Detect Respond Subs	$40,000.00	Within CEO authority
	Subtotal	*$959,744.00*	
Amendment 5	*Contract Time Extension*	*$283,426.00*	*Today's proposed action*
	Total Cost	**$1,243,170.00**	

DISCUSSION:

In today's digital landscape, cybersecurity is essential as cyber threats continue to grow in complexity and frequency. To protect its assets, operations, and reputation, the MTS Information Security and Intelligence (ISI) team must maintain and strengthen MTS's layered defenses. Darktrace's Intrusion Prevention and Detection Systems (IPS/IDS) and Microsoft 365 (M365) software as a service (SaaS) DETECT & RESPOND play critical roles in this strategy, offering both network-based and cloud-based threat detection and response capabilities.

Darktrace's artificial intelligence (AI)-driven IPS/IDS delivers autonomous, real-time threat detection and mitigation across the MTS network, enabling the ISI team to proactively counter threats. With limited control over user behaviors in M365 platforms such as SharePoint, OneDrive, and Teams, enhanced cloud security is vital to protect against unauthorized access and potential data breaches.

MTS, in common with other government agencies, is an increasingly attractive target for cyber-criminals and terrorists. As more devices are connected to our network, the dangers of data theft, vandalism, and real-world damage, e.g., overloading power substations, are constantly increasing.

To address this risk, MTS' ISI currently uses Darktrace's advanced IDS/IPS solution, which distinguishes itself by learning normal network behavior and identifying anomalies that signal potential threats. This capability enables the system to alert staff, recommend actions, or autonomously respond to threats within configured thresholds.

Key Capabilities of Darktrace IDS/IPS:

- Learns network behavior to detect anomalies and insider threats.
- Provides unified protection across network, email, IoT, and identity systems.
- Automatically mitigates attacks with high speed and precision.
- Reduces investigation time by over 90% through AI-driven analysis.
- Supplements limited staff resources to protect the agency's infrastructure.

Key Capabilities of Darktrace M365 SaaS DETECT & RESPOND:

- AI-driven monitoring enhances productivity by reducing manual workload.
- Detects zero-day and novel threats beyond traditional toolsets.
- Enables immediate, proportionate threat response to ensure operational continuity.
- Offers both automated and guided response options to support staff development.
- Seamlessly integrates into MTS's existing infrastructure.

MTS's current agreement with Darktrace for this suite of software, MTS Doc. No. G2386.0-20 through G2386.4-20, expires on July 15, 2025. Therefore, MTS needs to renew the software licensing and maintenance services to continue use of the software.
Since MTS's original procurement, Darktrace has added authorized resellers. Therefore, on February 27, 2025, MTS issued an Invitation for Bids (IFB) for Darktrace Software and Maintenance Renewal for a five-year period (3-year base with 2 option years). On April 1, 2025, MTS received a single bid from Nth Generation Computing Inc. (Nth). To confirm that the solicitation was not restrictive, MTS conducted a post-bid survey with prospective bidders requesting their reason(s) for not bidding. MTS received six (6) responses by the due date. The responses determined that some of the potential bidders needed more time to submit their bids.

In addition, staff determined that Nth's bid only priced the 3-year base period. Nth did not complete the bid form with pricing for the option years.

To address the error in Nth's bid and to ensure that all bidders had the opportunity to bid, staff decided to cancel the IFB and conduct a new solicitation. However, a new solicitation cannot be completed before the Darktrace contract expires on July 15, 2025. Therefore, MTS has requested that Darktrace extend the current contract on a short-term basis to allow MTS to complete the solicitation for a new five-year contract. Darktrace only provides 12-month or longer extensions. Today's proposed action would extend the current Darktrace contract for a 12-month period ending July 15, 2026.

This action will allow MTS the time to reevaluate the solicitation terms and make necessary revisions to ensure bidders have sufficient time to submit proposals.

Based on a comparison of MTS's Independent Cost Estimate (ICE) in the amount of $308,496.96, retail/market pricing, and recent comparable purchases made by other agencies, staff deemed Darktrace pricing for the 12-month extension to be fair and reasonable.

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to execute Amendment No.5 to MTS Doc. No. G2386.0-20 (in substantially the same format as Attachment A), with Darktrace, for Cyber Security in the amount of $283,426.00 for a 12-month contract time extension. (Attachment A).

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, juli.tuer@sdmts.com

Attachment: A. Draft Amendment G2386.5-20

Metropolitan Transit System

Amendment 5

June 26, 2025 MTS Doc No. G2386.5-20

DARKTRACE CYBERSECURITY SOFTWARE

Darktrace Limited
Rachel Elias-Jones
Financial Director
Maurice Wilkes Building, St. John's Innovation Park
Crowley Road, Cambridge, CB4 0DS, UK

This shall serve as Amendment No.5 to the original agreement G2386.0-20 as further described below.

SCOPE

There shall be no changes to the Scope of Services as a result of this Amendment. This Amendment shall provide a 12-month time extension for Darktrace Cyber Security Software licenses.

SCHEDULE

The contract term shall be extended from July 16 2025 to July 15, 2026.

PAYMENT

This contract amendment shall authorize an additional cost in the amount of $283,426.00. The total value of this contract, including this amendment, is $1,243,170.00. This amount shall not be exceeded without prior written approval from MTS.

Please sign and return a copy to the Contract Specialist at MTS. All other terms and conditions shall remain the same and in effect. Retain a copy for your records.

Sincerely,

Sharon Cooney, Chief Executive Officer

Agreed:

Rachel Elias-Jones, Financial Director
Darktrace Limited

Date: _____

Attachment: A. Darktrace Quote No.050825

DARKTRACE

PRODUCT ORDER FORM

Att. A, Item 10, 06/26/2025

Customer Name:	San Diego Metropolitan Transit System	**Product Order Form:**	195644-202505-07-1019104
Transactional Tax ID/Business Registration/VAT No:	NA	**Date Prepared:**	2025/05/07
Shipping Address:	1255 Imperial Avenue, Suite 1000, San Diego, CA 92101	**Expiry Date:**	2025/06/06
Invoice Address:	1255 Imperial Avenue, Suite 1000, San Diego, CA 92101		
Attn:	Christina Flores		
Email:	rodrigo.alonso@sdmts.com		

Darktrace Offering :

Product/Services Description	Quantity	Subscription Period (months)	Start Date	End Date	Annual Customer Price USD	Extended Customer Price USD
Platform Product						
Network						
Darktrace / NETWORK	7001-8000 IPs	12.0	2025-07-16	2026-07-15		
Email						
Darktrace / EMAIL (Exchange Online)	801-900 Active Users (Email)	12.0	2025-07-16	2026-07-15		
Identity						
Darktrace / IDENTITY	801-900 Active Users (Identity)	12.0	2025-07-16	2026-07-15		
Cross-Platform Product *[Not Ordered]*						
Platform Module *[Not Ordered]*						
Services *[Not Ordered]*						
Deployment						
On-Premises						
Darktrace On-Prem Appliance (Medium)	1 Appliances	12.0	2025-07-16	2026-07-15		
Darktrace On-Prem Appliance (X2)	1 Appliances	12.0	2025-07-16	2026-07-15		
Darktrace On-Prem Appliance (Z)	1 Appliances	12.0	2025-07-16	2026-07-15		
Training						
Trainings						
Darktrace Training (eLearning)	1					
Darktrace Training (Public)	1					
Darktrace Training (Remote)	2 Sessions					
Subscription period commencing on 2025/07/16 ("Commencement Date")						
Standard Support Services						
					283,426	283,426
TOTAL						**283,426**

Att. A, Item 10, 06/26/2025

Terms and Conditions:	
1	By signing this Product Order Form, issuing a purchase order referencing this Product Order Form or otherwise accessing or using the Offering, the Customer's use of the Offering shall be subject to the Darktrace Master Services Agreement included in the Appliance, which can also be found at: https://www.darktrace.com/resources/legal-online-terms.pdf ("Agreement"). Customer is in possession of the Appliance(s) listed above and shall not receive additional such Appliance(s) pursuant to this Product Order Form.
2	Use of Darktrace / NETWORK is limited to within the IP Count band specified above ("Usage Metrics"). For such purposes, "IP Count" is calculated by taking the peak unique IP address values (with VLANs differentiated) in any 24-hour period in the last 28 days. Should Usage Metrics be exceeded, additional Fees shall be payable.
3	Use of Darktrace / EMAIL is limited to within the band of Active Users specified above ("Usage Metrics"). For the purposes of Darktrace / EMAIL, an "Active User" consists of a mailbox, reported by the relevant provider, that has been seen to send or receive email in the last 28 days. Use of Darktrace / EMAIL may not exceed 9500 Mail Volume, as determined by the volume of inbound and outbound email in a 24 hour period ("Mail Volume"). Should the number of Active Users or Mail Volume usage exceed the figures set out above, additional Fees shall be payable.
4	Use of Darktrace / IDENTITY is limited to within the band of Active Users specified above ("Usage Metrics"). For the purposes of Darktrace / IDENTITY, an "Active User" consists of any object which can perform actions that are then reported by the API/logging of the 3rd-party product, including but not limited to 3rd-party user accounts, 3rd-party apps, and other 3rd party identities. The number of Active Users is calculated by taking the peak number of Active Users over all configured and applicable modules within Darktrace / IDENTITY seen over a 28-day period. Should Usage Metrics be exceeded, additional Fees shall be payable.
5	The Offering is made available on the basis of the relevant Product Specification, Service Definition, or other technical documentation (as applicable). Product Specifications and Service Definitions are found at: https://darktrace.com/legal/product-specifications-and-service-definitions, whilst other technical documentation can be found via the Customer Portal.
6	The Usage Metrics set out in the above Offering Table are in the aggregate, not in addition to any prior orders. In the event of conflict between the Usage Metrics of this Product Order Form and any prior order, the Usage Metrics of this Product Order Form are determinative.
7	The Appliance(s) are for use with respect to the Customer's applicable bandwidth throughput, number of connected devices and connections per minute as set out in the applicable Product Data Sheet (https://darktrace.com/resources/contract-data-sheets.zip) (the "Appliance Specifications"). Should the Appliance Specifications be exceeded, additional Fees shall be payable.
8	Fees are exclusive of any applicable sales tax, goods and services tax, withholding tax or VAT. Fees will be invoiced in advance in accordance with the below invoicing schedule. Payment terms Net 30.
9	If Customer requires a purchase order, it must be sent at the time of acceptance of this Product Order Form and be for the full contract value. If it is not received, Darktrace shall be entitled to invoice without it.
10	Acceptance of this Product Order Form is expressly limited to the terms of Darktrace's offer. Once accepted, the terms and conditions of this Product Order Form and the Agreement will be the complete and exclusive statement of the agreement between the parties. Any modifications proposed by Customer are expressly rejected by Darktrace and shall not become part of the Agreement in the absence of Darktrace's written acceptance.
11	This Product Order Form may be executed in any number of counterparts and by different parties in separate counterparts. Each counterpart when so executed shall be deemed to be an original and all of which together shall constitute one and the same agreement. Transmission of the executed counterpart of this Product Order Form by email (in PDF, JPEG or other agreed format) shall take effect as delivery of an executed counterpart.

Att. A, Item 10, 06/26/2025

Invoicing Schedule:				
Invoice Date	**From**	**To**	**Amount**	**Currency**
2025-07-16	2025-07-16	2026-07-15	283426.00	USD

For Customer

Signature:

Name:

Job Title:

Signature Date: _____
("Effective Date")

For Darktrace:

Signature:

Name:

Job Title:

Signature Date:

Agenda Item No. 11

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Facility Roof Solar Assessments – Work Order Agreement

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute Work Order Amendment WOA356-AE-55 under MTS Doc No. PWL356.0-22 (in substantially the same format as Attachment A) with Pacific Railway Enterprises, Inc. (PRE), Disadvantaged Business Enterprise (DBE), in the amount of $219,161.44 to provide engineering services to assess the installing rooftop solar on MTS existing facilities.

Budget Impact

The total cost of this contract is estimated to be $219,161.44. The project will be funded by the Capital Improvement Program (CIP) 2006121801 – Facility Roof Solar Assessments

DISCUSSION:

The objective of this project is to evaluate the operational and economic feasibility of adding solar equipment to existing MTS facilities. The results of the study will be used for future facility planning with a goal to reduce the quantity of imported utilities, while maximizing the full potential of available space (i.e., rooftops, parking garages/lots, etc.).

The consultant's assessments will provide analysis and recommendations for existing MTS facilities to compare the current energy usage to energy generation potential of each facility. Additionally, the study will review the current structures and electrical systems for feasibility of supporting and connecting solar equipment, and recommending upgrades as needed. Finally, the study will provide the economic feasibility to evaluate estimated project costs and determine the anticipated payback schedule, including options and recommendations for financing methods and current rebate, incentive, and subsidy programs.

Under the proposed work order, PRE will provide site assessments at the following MTS facilities: Imperial Avenue Division (IAD), Kearny Mesa Division (KMD), South Bay Bus Maintenance Facility (SBMF), East County Division, Copley Park Division (CPD), Mills Building with parking garage, Buildings A, B, &C, Pyramid Building, Iris Transit Center, Otay Transit Center, and El Cajon Transit Center.

On September 15, 2021, MTS issued a solicitation for On-Call Architectural and Engineering (A&E) Design Services by requesting Statements of Qualifications (RFSQ) from firms with expertise in a variety of A&E design and related consulting services separated into the following three (3) categories:

Category A: Comprehensive/Full Service - Five (5) prime contracts
Category B: Small Business Set Aside- Three (3) prime contracts awarded to a certified Small Business (SB) or a DBE certified firm, (which is also considered to be a SB)
Category C: Specialty Prime – Up to Five (5) specialty service contracts

As a result of the RFSQ, seven (7) firms were selected to perform various A&E services. For projects requiring A&E Services, work orders are issued to these firms.

On January 3, 2025, MTS issued a Request for Proposals (RFP) to all firms in Categories A and B.

On February 28, 2025, MTS received a total of three (3) proposals from the following A&E firms:

Firm Name	Firm Certification
Chen Ryan Associates (CRA)	DBE, Minority-Owned Business Enterprise (MBE) and Woman-Owned Business Enterprise (WBE)
Mott MacDonald Group, Inc.	None
PRE	DBE

An evaluation panel was comprised of MTS representatives, and the proposals were evaluated based on the following factors.

Criteria	Points
Project Team	20
Project Team's Capabilities	20
Project Understanding and Approach	40
Schedule	20
Total Possible Score	**100**

On March 27, 2025, the selection committee evaluated the initial proposals and scored as follows:

Ranking	Proposer Name	Total Score
1.	PRE	88.00
2.	Mott MacDonald Group, Inc.	86.33
3.	CRA	79.33

As a result of the evaluations, PRE was deemed the most qualified firm to perform the services. PRE's initial proposed amount for the services was $239,001.63. Through negotiations, staff were able to reduce the cost by $19,840.19, an 8% savings to MTS. The Independent Cost Estimate (ICE) for the services was $217,520.08. Based on the level of effort and proposal

classifications, PRE's final cost proposal in the amount of $219,161.44 was determined to be fair and reasonable.

For the project, PRE will utilize the following subcontractors:

Subcontractor Firm Name	Firm Classification	Dollar Value of Subcontract
AECOM	None	$205,646.32

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to execute Work Order Amendment WOA356-AE-55 under MTS Doc No. PWL356.0-22 (in substantially the same format as Attachment A) with PRE, a DBE, in the amount of $219,161.44 to provide engineering services to assess the installing rooftop solar on MTS existing facilities.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. Draft Work Order WOA356-AE-55

Metropolitan Transit System

June 26, 2025

MTS Doc. No. PWL356.0-22
Work Order No. WOA356-AE-55

Pacific Rail Enterprises, Inc.
Jennifer Seccombe
President/CEO
3560 University Ave, Suite F
Riverside, CA 92501

Dear Mrs. Seccombe:

Subject: WORK ORDER WOA356-AE-55, TO MTS DOC. NO. PWL356.0-22, GENERAL ENGINEERING SERVICES FOR THE ADMIN FACILITY ROOF SOLAR ASSESSMENT PROJECT

This letter shall serve as our agreement for Work Order WOA356-AE-55 to MTS Doc. No. PWL356.0-03, for engineering services under the General Engineering Consultant Agreement, as further described below.

SCOPE OF SERVICES

This Work Order shall provide design services for the Admin Facility Roof Solar Assessment project in accordance with the attached Scope of Services. (Attachments A and A1).

SCHEDULE

The Schedule shall remain in effect for a period of one hundred twenty (120) calendar days from the date of the of the Notice to Proceed (NTP).

PAYMENT

Payment shall be in the amount of $219,161.44. The Payment shall be based on actual costs, and shall not be exceeded without prior authorization of MTS (Attachment B).

Please sign below, and return the document to the Contracts Specialist at MTS. All other terms and conditions shall remain the same and in effect.

Sincerely,

Sharon Cooney
Chief Executive Officer

Accepted:

Jennifer Seccombe, President/CEO
Pacific Rail Enterprises

Date:

Attachments: A, Scope of Services
A1, Consultant's Proposal
B, Negotiated Fee Proposal

ATTACHMENT A
SCOPE OF SERVICES

TITLE: ADMIN FACILITY ROOF SOLAR ASSESSMENT WOA #: WOA356-AE-55

I. PROJECT DESCRIPTION

The San Diego Metropolitan Transit System, (referred to hereafter as "MTS") seeks a proposal for consultant services for solar assessment on MTS existing facilities.

The objective of this project is to reduce the usage of importing utilities and have a self-sufficient energy system, while maximizing the full potential usage of available space such as rooftops, parking garages, etc.

This project is necessary to develop recommendations and conclusions from the solar assessment, and will be conducted at each location provided in Exhibit A, Location Map Reference.

II. SCOPE OF WORK

The scope of work shall consist of the following tasks and deliverables:

Task 1: Project Management and Coordination

1.1 Provide project management services including the requirements for invoicing, scheduling, monthly project progress reports, and administration of the Consultant's team.

1.2 Provide project coordination with MTS as well as coordination with other project stakeholders as necessary.

1.3 Provide coordination and oversight of subconsultant(s) and integration of plans and specifications into submittal packages.

1.4 Also included in Project Management is QA/QC which will be performed on all deliverables. To ensure quality of work and compliance with the scope of work, the consultant shall perform a systematic in-house review of all documents produced prior to submittal. All reviewed documents will have a check box or signature page indicating review has been performed.

Task 2: Solar and Energy Analysis:

2.1 Total generation of energy, given available space.

2.2 Anticipated electrical savings from solar equipment.

2.3 Comprehensive review of latest solar system technologies and efficiencies.

2.4 Minimum and maximum recommended installation capacity of solar equipment.

2.5 Energy storage systems (battery storage) and their applicability to each location, and their capability to integrate with existing systems at each site (especially at bus division sites, since energy usage will likely be higher).

2.6 Comparison of actual electricity consumption of each facility (Exhibit A) to the optimized system size and output.

2.7 Anticipated site-specific challenges; especially potential California Environmental Quality Act (CEQA) concerns.

Deliverable: Summary of Report, Estimates

Task 3: Electrical and Structural Analysis:

3.1 Determine the feasibility of connecting a solar system to each building's electrical system. Applicability of integrating the solar system with existing charge management system at Bus Division.

3.2 Feasibility of adding carport structures that can support solar panels at open parking areas.

3.3 Feasibility of whether or not the building rooftops or building facilities are structurally adequate to support the load of solar systems in accordance with current building code requirements.

3.4 Expected solar energy output shall be compared to actual electricity consumption for each facility.

3.5 Data shall include the metering and observation necessary to produce a time of use load profile for the facility.

3.6 Provide recommendations on any necessary upgrades to electrical transfer switches and other modification(s) for interconnection.

Deliverable: Summary of Report, Estimates

Task 4: Economic Feasibility and Financing Analysis:

4.1 The economic feasibility and financing analysis shall be conducted for each facility, to determine the following:

4.1.1 The economic feasibility of each solar installation, with realistic project costing forecasts; and "payback" time period for each location.

4.1.2 Available state and federal rebate/incentive programs.

4.1.3 Applicable electricity rate schedules.

4.1.4 Net metering applicability and cost effectiveness or any other utility incentive/subsidy (ex. SDG&E's Self-Generation Incentive Program (SGIP), which includes solar/battery storage installations.

4.2 Provide an estimate of the cost of any necessary upgrades related (i.e. structural, architectural, etc.)

4.3 Recommended financing methods (i.e. direct purchase, lease, Power Purchase Agreements (PPA), etc.)

Deliverable: Summary of Report, Estimates

Task 5: Preliminary and Final Report Documentation:

5.1 Provide 50% preliminary report to determine whether or to continue with the study.

5.1.1 The information gathered at this stage of the study must be sufficient for MTS to decide whether to proceed with the final report.

5.2 Provide conclusions and recommendations. (Alternative Task)

5.2.1 The conclusions of the study must be sufficient for MTS to decide whether to proceed on this upgrade.

Deliverable: 50% Preliminary Report
Summary of Report, Recommendations and Estimates

III. PERIOD OF PERFORMANCE

Services shall be completed within one hundred twenty (120) calendar days from the date of the of the Notice to Proceed (NTP).

IV. DELIVERABLES

Based on an assumed NTP start date of December 2023, final documents will be prepared and anticipated to be delivered within 120 days of NTP for MTS. Revisions due to final comments received from MTS or during the assessment process will be incorporated into a final Document set. The schedule of deliverables is contingent upon receiving timely comments from MTS.

V. SCHEDULE OF SERVICES/MILESTONES/DELIVERABLES

A. Tasks Schedule

Task	Begin/End Dates
TASK 1: Project Management	NTP/120 days
TASK 2: Solar and Energy Analysis	NTP/120 days
TASK 3: Electrical and Structural Analysis	NTP/120 days
TASK 4: Economic Feasibility and Financing Analysis	NTP/120 days
TASK 5: Preliminary Report	NTP/60 days
Final Report Documentation	NTP/120 days

B. Milestones/Deliverables Schedule

Milestone/Deliverable	Due Date
TASK 5/Final Report Documentation	NTP/120 days

VI. MATERIALS TO BE PROVIDED BY MTS AND/OR THE OTHER AGENCY

Background reports from prior work efforts will be provided by MTS

VII. SPECIAL CONDITIONS

Not Applicable.

VIII. MTS ACCEPTANCE OF SERVICES:

Contractor shall not be compensated at any time for unauthorized work outside of this Work Order. Contractor shall provide notice to MTS' Project Manager upon 100% completion of this Work Order. Within five (5) business days from receipt of notice of Work Order completion, MTS' Project Manager shall review, for acceptance, the 100% completion notice. If Contractor provides final service(s) or final work product(s) which are found to be unacceptable due to Contractors and/or Contractors subcontractors negligence and thus not 100% complete by MTS' Project Manager, Contractor shall be required to make revisions to said service(s) and/or work product(s) within the Not to Exceed (NTE) Budget. MTS reserves the right to withhold payment associated with this Work Order until the Project Manager provides written acceptance for the 100% final completion notice. Moreover, 100% acceptance and final completion will be based on resolution of comments received to the draft documents and delivery of final documentation which shall incorporate all MTS revisions and comments.

Monthly progress payments shall be based on hours performed for each person/classification identified in the attached Fee Schedule and shall at no time exceed the NTE. Contractor shall only be compensated for actual performance of services and at no time shall be compensated for services for which MTS does not have an accepted deliverable or written proof and MTS acceptance of services performed.

IX. DEFICIENT WORK PRODUCT

Throughout the construction management and/or implementation phases associated with the services rendered by the Contractor, if MTS finds any work product provided by Contractor to be deficient and the deficiently delays any portion of the project, Contractor shall bear the full burden of their deficient work and shall be responsible for taking all corrective actions to remedy their deficient work product including but not limited to the following:

- Revising provided documents,

At no time will MTS be required to correct any portion of the Contractors deficient work product and shall bear no costs or burden associated with Contractors deficient performance and/or work product.

X. DELIVERABLE REQUIREMENTS

Contractor will be required to submit any and all documentation required by the Scope of Work. The deliverables furnished shall be of a quality acceptable to MTS. The criteria for acceptance shall be a product of neat appearance, well-organized, and procedurally, technically and grammatically correct. MTS reserves the right to request a change in the format if it doesn't satisfy MTS's needs. All work products will become the property of MTS. MTS reserves the right to disclose any reports or material provided by the Contractor to any third party.

Contractor shall provide with each task, a work plan showing the deliverables schedule as well as other relevant date needed for Contractor's work control, when and as requested by MTS.

Contractor's computer data processing and work processing capabilities and data storage should be compatible with Windows compatible PC's, text files readable in Microsoft Word, and standard and customary electronic storage. Contractor shall maintain backup copies of all data conveyed to MTS.

Contractor shall provide MTS with hard copy or electronic versions of reports and/or other material as requested by MTS.

XI. PRICING

Except where otherwise noted herein, pricing shall be firm and fixed for the duration of the Work Order and any subsequent Change Orders/Amendments to the Work Order. There shall be no escalation of rates or fees allowed.

XII. ADDITIONAL INFORMATION

List additional information as applicable to the specific Work Order scope of services.

XIII. PREVAILING WAGE

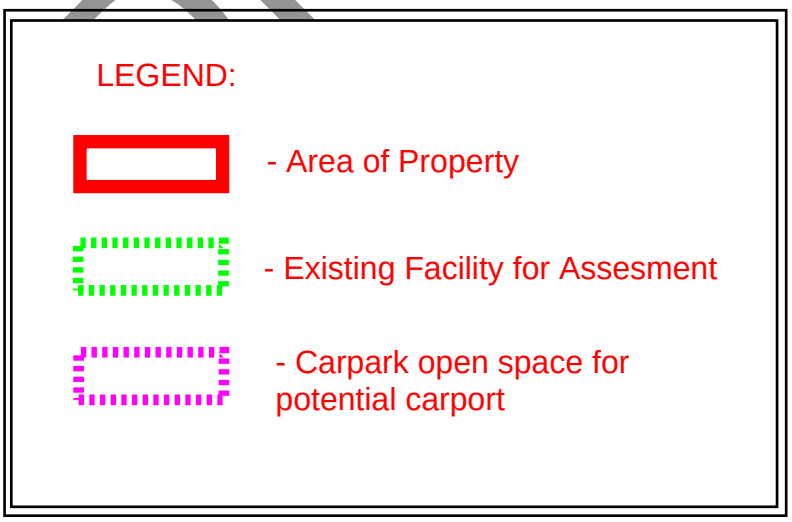
Prevailing wage rates apply to certain personnel for these services? ☐ Yes ☒ No

Attachments: Exhibit A, Location Map Reference

EXHIBIT A
LOCATION MAP REFERENCE

ADMIN FACILITY ROOF SOLAR ASSESSMENT

(LOCATION MAP REFERENCE)



1. Bus Division Maintenance Buildings

Imperial Avenue Division (IAD)

Legend
100 16th Street, San Diego, CA

K St
K St
K St
K St
17th St
14th St
16th St
17th St
L St
100 16th St
Imperial Ave
Imperial Ave
Imperial Ave

LEGEND:

- Area of Property

- Existing Facility for Assesment

- Carpark open space for potential carport

300 ft

N

Image Landsat / Copernicus

Kearny Mesa Division (KMD)

Legend

4630 Ruffner Road San Diego, CA 92111 United States

GameSync Gaming Center

Parkhouse Tire

Opportunity Rd

4630 Ruffner St

Ruffner St

Darnell St

LEGEND:

- Area of Property

- Existing Facility for Assesment

- Carpark open space for potential carport

300 ft

N

South Bay Division (SBD)

Legend

3610 Main Street Chula Vista, CA 91911 United States

LEGEND:

- Area of Property
- Existing Facility for Assesment
- Carpark open space for potential carport

Transdev

3610 Main St

MTS South Bay

Sav-On Storage

Main St

Main St

Main St

MTS DOC NO. PWL356.0-22, WOA356-AE-55 A - 14

300 ft

N

East County Division (ECD)

Legend

544 Vernon Way El Cajon, CA 92020 United States

McAlister Institute - East County Regional...

544 Vernon Way

Transdev

N Johnson Ave

Vernon Way

Vernon Way

Vernon Way

San Diego Custom Cabinets

VCSD

Airgas Store

Cutz Vinyl

Pioneer Way

LEGEND:

- Area of Property

- Existing Facility for Assesment

- Carpark open space for potential carport

300 ft

Copley Park Division

Legend

7490 Copley Park Pl San Diego, CA 92111 United States

Mt Soledad Fwy

San Clemente Canyon Fwy

Solids Blvd

7490 Copley Park Pl

La Mesa RV Center San Diego

First Transit

Camping

Copley Park Pl

Copley Park Pl

Copley Park Pl

LEGEND:

- Area of Property

- Existing Facility for Assesment

- Carpark open space for potential carport

N

300 ft

2. Buildings A / B / C and Mills Building with Carpark

Bldg. A, B, C, Mills Bldg and Carpark, Pyramid Bldg

Legend
1255 Imperial Ave

1255 Imperial Ave
Mills Bldg.
Carpark
Bldg. B
Bldg. A
Bldg. C
Pyramid Bldg.

12th Ave
12th Ave
13th St
14th St
Commercial St
National Ave
National Ave
National Ave
S 16th St
Sigsbee St
Newton Ave
Eleventh Ave
Main St
Harbor Dr
E Harbor Dr
E Harbor Dr
Harbor Dr
Harbor Dr
E Harbor Dr

LEGEND:

- Area of Property
- Existing Facility for Assesment
- Carpark open space for potential carport

500 ft

3. Trolley Station & Transit Centers

Iris Transit Center

Legend

- Iris Ave Station
- Iris Avenue Transit Center

Casa Pacifica ADHC
30th St
Tony's Hotel Liquidators
The Studio Beauty Bar
BST Motorsports
Day and Night Signs
A J Wholesale Mart
Iris Avenue Transit Center
Carfull | Selling Your Car Made Easy
1405-1499 30th St Parking
Iris Ave Station
Iris Avenue Transit Center
BikeLink : Iris Trolley Station
Diaz Auto Repair
Iris Ave
Liva Distributor
Las Ranas Lonchera Mariscos
Howard Ave
905

LEGEND:

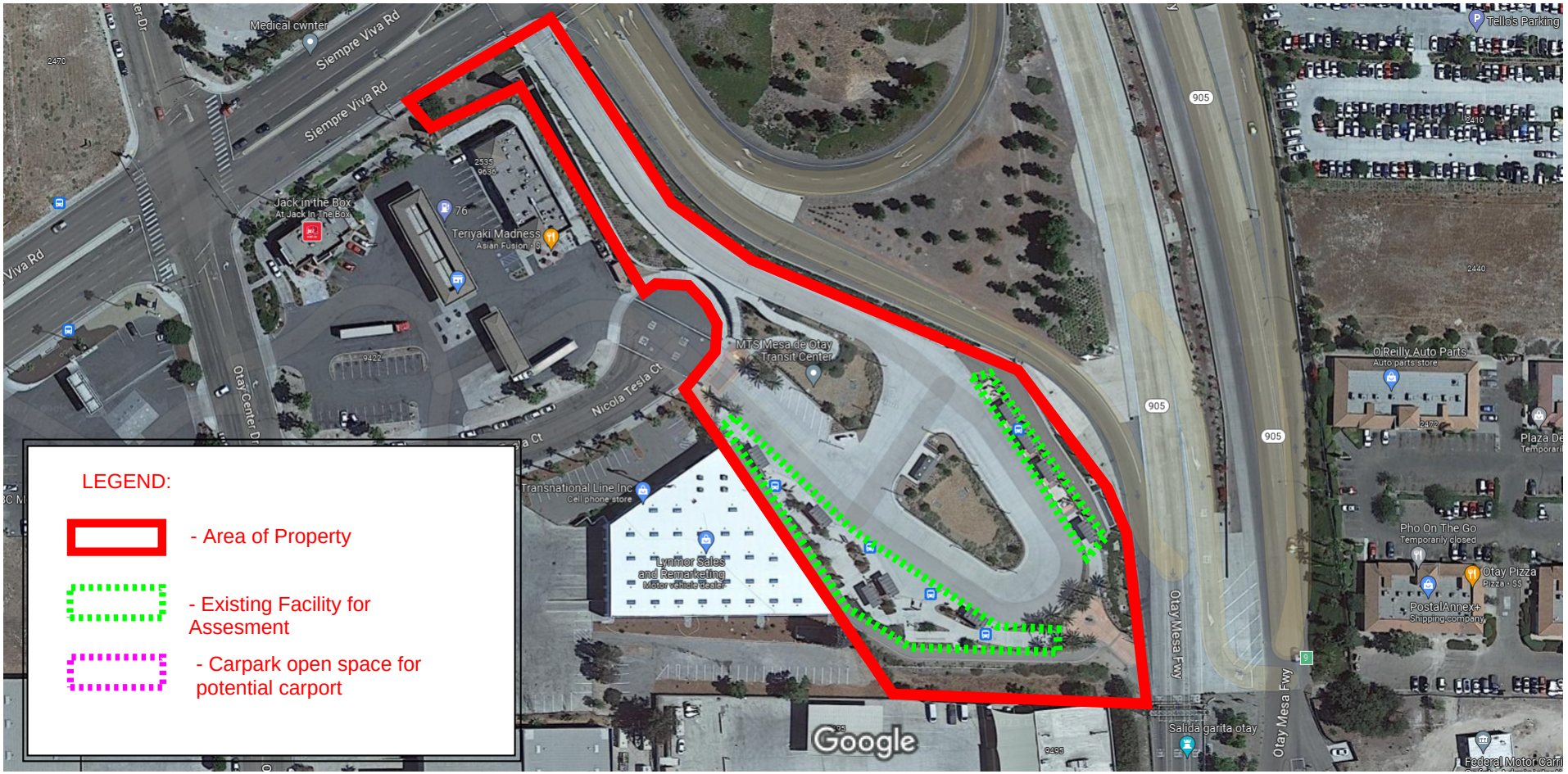
- Area of Property
- Existing Facility for Assesment
- Carpark open space for potential carport

MTS DOC NO. PWL356.0-22, WOA356-AE-55 A - 20

N

300 ft

Google Maps Otay Transit Center



Imagery ©2023 Airbus, CNES / Airbus, Maxar Technologies, U.S. Geological Survey, Map data ©2023 Google 50 ft

El Cajon Transit Center

Legend

El Cajon Transit Center

LEGEND:

- Area of Property

- Existing Facility for Assesment

- Carpark open space for potential carport

S Pierce St

S Pierce St

Kumeyaay Hwy

16

8

Front St

El Cajon Transit Center

El Cajon Transit Center

Front St

S Marshall Ave

S Marshall Ave

S Marshall Ave

Google Earth

Image Landsat / Copernicus

300 ft

N

ATTACHMENT A1
CONSULTANT'S PROPOSAL

PWL356.0-22 Work Order Agreement
Request for Proposal

February 28, 2025

ADMIN FACILITY ROOF SOLAR ASSESSMENT
WOAXXX-AE-55

Pacific Railway Enterprises, Inc.
3560 University Avenue
Suite F
Riverside, CA 92501

AECOM

PACIFIC RAILWAY ENTERPRISES, INC.

February 28, 2024

Mr. Steve Augustyn
Contract Officer
San Diego Metropolitan Transit System
1255 Imperial Avenue
San Diego, CA 92101

RE: Request for Proposal for Contract PWL356.0-22, Work Order Agreement WOAXXX-AE-55

Dear Mr. Augustyn ,

Pacific Railway Enterprises, Inc (PRE) is pleased to submit this proposal for your review and consideration for the Admin Facility Roof Solar Assessment.

AECOM will lead the technical work with PRE leading project management.

Below is PRE's company information:

- Contact: President/CEO, Jennifer A. Seccombe, PE; jaseccombe@pacrail.com
- Address: 3560 University Avenue, Suite F, Riverside, CA, 92501
- Telephone: (951) 784-4630, x110
- DBE Firm CUCP #42273; DIR #1000009052
- Website: www.pacrail.com

Within this proposal we have demonstrated our team's relevant qualifications and experience, our understanding and approach to this project, a proposed schedule, and resumes of key individuals from our team. As the Project Manager, I commit to working closely with you to make this project a success.

Thank you for this opportunity and we look forward to meeting MTS's objectives for Admin Facility Roof Solar Assessment.

Sincerely,

Eric L. Roe

Eric Roe
Director of Strategic Initiatives
Pacific Railway Enterprises, Inc.

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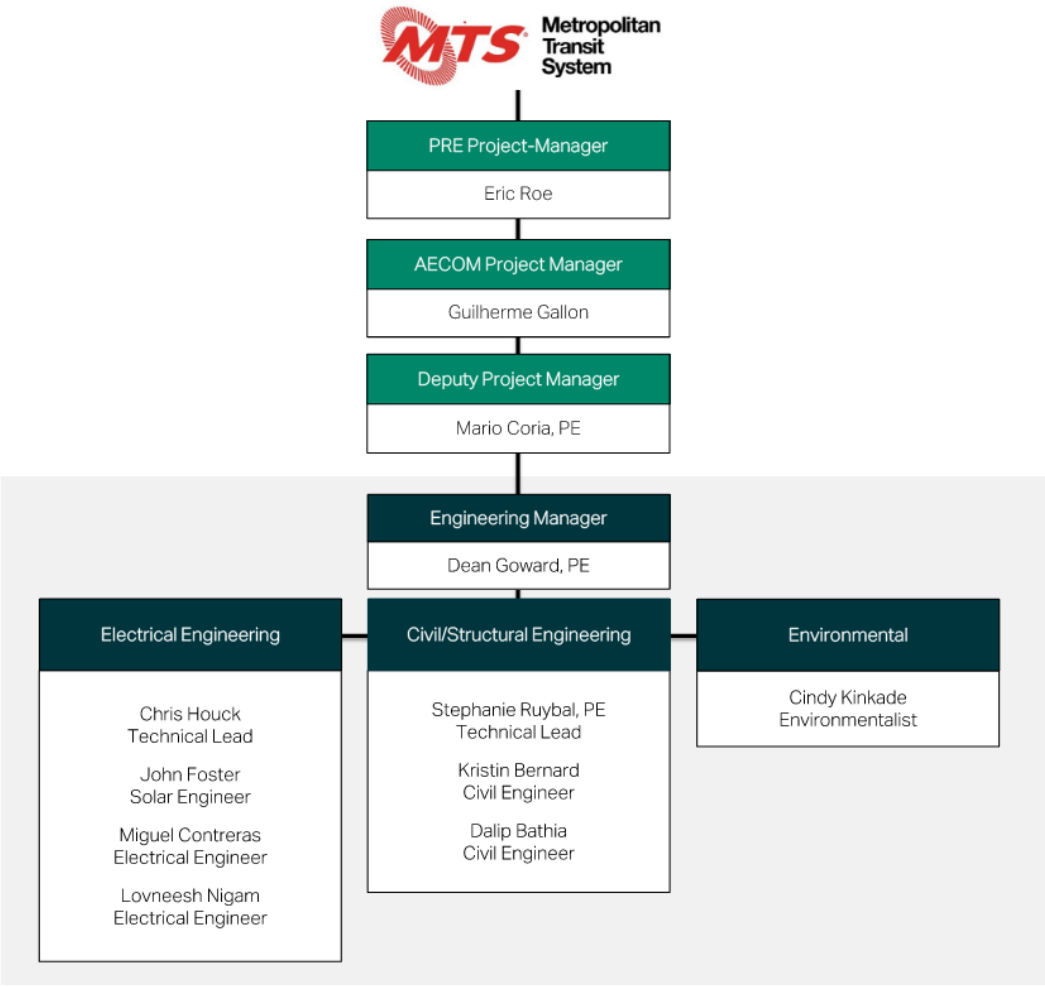
01. Project Team

Organization Chart

The following organizational chart shows our project team and their respective roles. Resumes are included in Appendix A.

Figure 1 – Project Organization Chart



Project Management

Eric Roe (PRE) will lead the team as the Project Manager. Eric has a long history working in San Diego County having previously worked for North County Transit District. Eric has 18 years of working in the transportation and railroad industry providing project management for multiple projects including NCTD's Positive Train Control Project valued at $87 Million. Eric has been the Project Manager on several PRE projects including LA Metro and RCTC.

Guilherme Gallon, M.Sc. Eng., will be assigned as the AECOM's Project Manager. Guilherme specializes in wind and solar energy projects, bringing over 10 years of experience in the renewable energy sector and in project management. Mr. Gallon will oversee the entire project and serve as the main point-of-contact for the project. Mr. Gallon is currently managing numerous solar PV projects, a majority of which are rooftop or carpark projects.

His experience includes managing a portfolio of over a dozen Solar PV projects spread across several states within mainland USA. The client is acquiring projects from a developer and seeks AECOM's assistance with Due Diligence and Owners Engineering work.

Mario Coria, PE, will function as a Deputy Project Manager and support Guilherme as needed in the delivery of the project and managing the schedule and budget as well as lead the design work with the AECOM engineering team. Mario will liaise with the engineering team to ensure that communication is clear, and scope commitments are delivered to MTS. Mario also has significant experience with solar design and will act as the Engineer of Record for the final construction documents, if required.

He is currently a project manager located in our San Diego office assisting customers through the engineering process of their grid tie utility scale and commercial PV Solar projects. His responsibilities include engineering due diligence, feasibility studies, location/site evaluation, point of interconnection infrastructure assessment, pre-construction documentation reviews, support AHJ permitting efforts, energy studies, review of engineering drawings (IC, IFP, IFC), construction life-cycle reports review, commissioning test reports review, onsite inspection of projects during all stages of construction.

Ivan Welander, PE, will function as the QA/QC engineer for the project deliverables. Mr. Welander is an electrical engineer who brings an analytical and open-minded approach to all power engineering projects. He joined AECOM's Energy business line to share project expertise spanning transmission, distribution, substations, and renewable energy. Ivan has been a key contributor on many projects at AECOM, including engineering and design of T&D and renewable energy generation projects such as solar PV, battery energy storage, wind, and hydropower for a mix of utility, government, and private industry clients.

For the SunPower Corporation, Ivan provided electrical design and engineering for a 10MWac solar PV carport system and 7.5MW/25MWH energy storage at John F. Kennedy airport in New York. Project interconnections included both new service for export to ConEd and integration with JFK's existing 13.8KV AirTrain system.

Electrical Engineering

Chris Houck will serve as the Solar Technical Lead and will lead the design work with AECOM's team. Mr. Houck is an innovative and knowledgeable project designer with almost 15 years of experience in the energy field, working on commercial, industrial and utility solar PV and battery energy storage systems as well as electric vehicle (EV) charging stations. He brings a strong background in low—and medium-voltage grid systems.

He has extensive experience designing roof mounted PV systems for notable clients such as TESLA (500kW roof mounted PV array at Fremont, CA factory), Amazon (3.8MW DC roof mounted PV array at a New Jersey distribution center), and Home Depot (1MW DC roof mounted PV array at various stores).

Miguel Contreras is an experienced solar designer with more than 16 years of experience in the energy field working on residential, commercial, and industrial PV systems. He brings a strong background in low voltage grid systems. He also has experience in fire sprinkler design and solar photovoltaic (PV) construction management.

He has designed projects numerous PV system projects for clients such as Siemens (roof-mounted PV systems at various sites with a total system capacity of 40MW DC) and Wells Fargo Bank (6MW DC roof top PV system in Texas).

Lovneesh Nigam is a Solar Engineer with experience in implementing large-scale energy projects. Hi areas of expertise include solar PV and electrical design, renewable energy systems, energy and financial analysis, and battery energy storage design, and power.

Mr. Nigam was recently the lead solar designer for a 2.25 MWac rooftop solar PV system at Terminal 6 of JFK Airport. His responsibilities included development of the solar layout, DC electrical design, performance modelling and coordination with the AC electrical design, civil, and structural design teams. AutoCAD, Helioscope, PVSyst, and Forge Solar were the tools used to accomplish a detailed design and energy analysis.

Civil/Structural Engineering

Stephanie Ruybal, M.Sc. Eng., PE, will serve as the Technical Lead for the Civil and Structural analysis. Ms. Ruybal is a seasoned civil/structural engineer within the Energy Services at AECOM with over 20 years of experience in the evaluation of existing structures, designing steel superstructures, and creating foundation designs. Her expertise ensures safe, efficient, and innovative solutions for a wide range of engineering challenges.

For the City of Burbank, Stephanie served as lead structural engineer for a rooftop photovoltaic evaluation in Burbank, CA. She evaluated the feasibility of adding new photovoltaic panels to the roof of an existing structure and authored a feasibility report supported by site visit observations and design calculations.

Kristin Bernard, PE, has 19 years of experience in design of structural steel, concrete, foundations, and pipe/equipment supports for manufacturing petrochemical, and solar PV facilities. Her experience also includes evaluating stormwater impacts of new construction for permitting.

She is currently the lead civil engineer/engineer of record for various multi-discipline projects for the Department of Energy. Her responsibilities included development of detailed drawings and specifications, performing engineering calculations, and providing construction support through submittal review and responding to construction questions.

Environmental

Cindy Kinkade will serve as the Technical Lead for the Environmental analysis. Cindy is a senior project manager with over two decades of experience in the private and public sectors, including a broad range of knowledge of environmental compliance requirements for projects, from planning and design review through construction and post-construction monitoring.

She has coordinated environmental compliance for projects in various capacities and has expertise in project design review; California Environmental Quality Act/National Environmental Policy Act document review and preparation; public involvement; agency and permitting coordination; permit processing of city, state, and federal permits; construction and stormwater monitoring; and mitigation implementation and reporting requirements.

Project Team Time Commitment

Table 1 shows the approximate time commitment each key team member will dedicate to the project.

Table 1 – Project Team Time Commitment

Team Member	Role	Commitment (%)
Eric Roe (PRE)	PRE Project Manager	5%
Guilherme Gallon	Project Manager	5%
Mario Coria, PE	Deputy Project Manager	5%
Ivan Welander, PE	QA/QC Manager	3%
Chris Houck	Lead Electrical Engineer	20%
Miguel Contreras	Electrical Engineer	23%
Lovneesh Nigam	Electrical Engineer	22%
Stephanie Ruybal, MSc Eng, PE	Lead Civil/Structural Engineer	6%
Kristin Bernard, PE	Civil Engineer	6%
Cindy Kinkade	Environmentalist	10%
	TOTAL	**100%**

02. Project Team Capabilities

The PRE & AECOM team demonstrates robust management, coordination, and scheduling capabilities across various domains, ensuring efficient project delivery and stakeholder alignment. Here are key highlights:

Management, Coordination, and Scheduling

The PRE & AECOM team employs a project management methodology that is highly successful and will support all the project requirements, ultimately leading to the deliverables anticipated under this contract. The methodology embodies certain organizational principles, repeatedly used as keystones to achieve a fully integrated effort to meet standards of quality and adhere to cost estimates and schedules. These principles include:

- Establishing clear lines of communication, responsibility, and authority
- Using uniform means of collecting and disseminating information
- Establishing and maintaining realistic baselines, cost estimates, and schedules – against which performance can be measured.
- Promoting the use of standardized and disciplined work practices for all project participants and verifying compliance with these practices
- Assigning personnel with proven leadership and experience whose priority is to the project.
- Satisfying the technical, cost, and schedule requirements of the project

Eric Roe will be the overall Project Manager and as AECOM Project Manager and Deputy Project Manager respectively, Guilherme Gallon and Mario Coria will execute the above to achieve the goals and expectations outlined in this scope of work. Eric Roe will also be the primary point of contact for MTS with the AECOM team supporting.

Commitments and Priorities

The AECOM technical team maintains a resource utilization rate of around 80%, allowing flexibility to address changes in project demands. Our Project Manager, Deputy Project Manager, and Technical Lead can all serve as points-of-contact, ensuring continuity during planned or unplanned events.

Quality Control/Quality Assurance

Our approach to quality follows the international standard for quality management systems (QMS), ISO 9001. As one of the few ISO 9001-certified professional and technical services firms in North America, AECOM developed its system to address the standard's requirements, and we confirm compliance through formal auditing and verification. Initially certified in 2002, we have continuously expanded the scope of our ISO certification. In fact, during 2011 we achieved a single, unified ISO 9001:2015 certification covering all our business lines in North America.

What does this mean to our clients? It means that AECOM has a world-class quality program with tools and means to confirm it is followed. It means that AECOM consistently applies a set of quality practices throughout the company, regardless of where work is performed or managed. It means that AECOM's QMS is built upon the eight foundational principles that lie at the core of the ISO standard providing a strong footing for positive results.

Figure 2 – AECOM Quality Assurance Phases

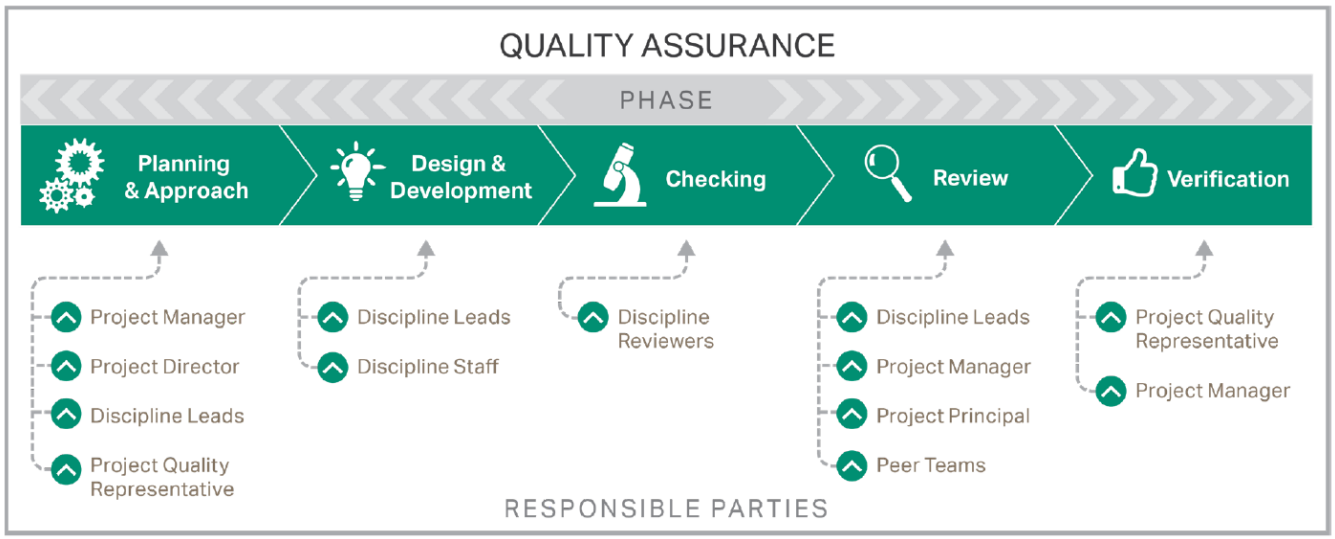
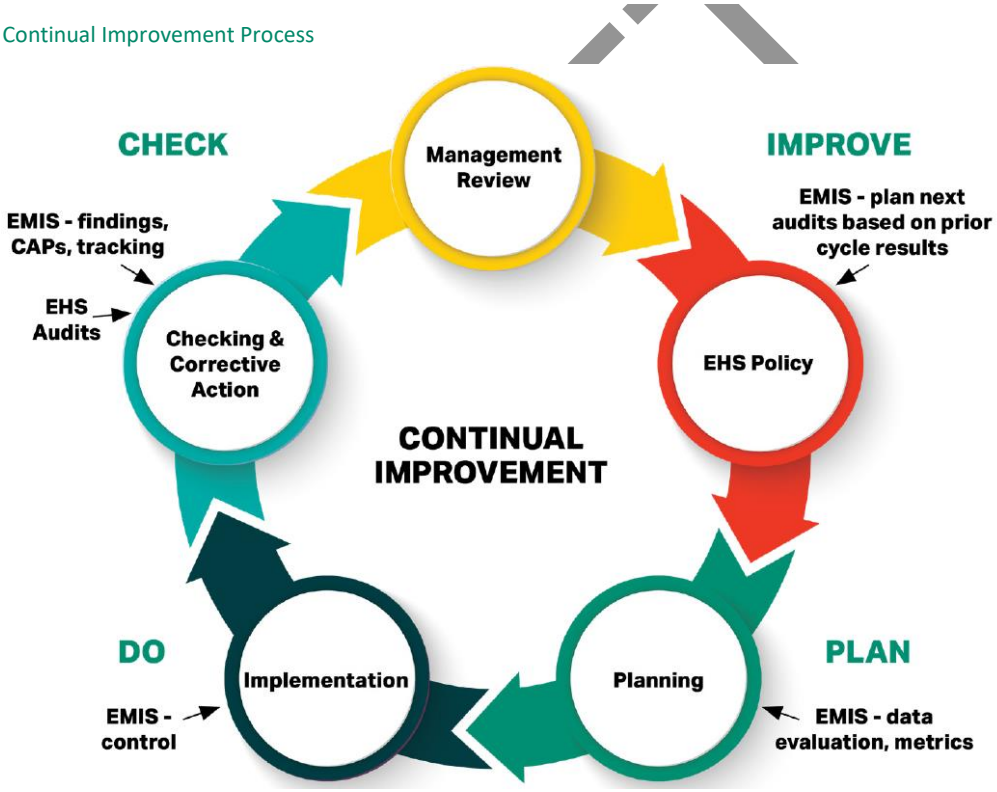


Figure 3 – AECOM Continual Improvement Process



Project Cost Management

The PRE & AECOM team employ comprehensive strategies to manage and control costs throughout the lifecycle of a project. Here are the key components of cost management and control approach:

Cost Estimation and Budgeting

Detailed Cost Estimation: The team begins with a detailed cost estimation process, using historical data, industry benchmarks, and advanced modeling techniques to develop accurate initial budgets. This process involves collaboration with various stakeholders to ensure all potential costs are considered.

Budget Development: A robust budget is developed based on the detailed cost estimates. This budget serves as a financial blueprint for the project, outlining expected expenditures and providing a framework for financial decision-making.

Cost Monitoring and Control

Real-Time Tracking: Utilizing advanced project management software to track costs in real-time. This allows for continuous monitoring of expenditures against the budget, enabling early detection of variances and timely corrective actions.

Variance Analysis: Regular variance analysis is conducted to compare actual costs with budgeted figures. This analysis helps identify areas of overspending or underspending, allowing project managers to adjust strategies and resources accordingly.

Change Management: Implement a structured change management process to assess the financial impact of any project changes. This ensures that all changes are evaluated for cost implications before approval, maintaining budget integrity.

Risk Management and Contingency Planning

Risk Assessment: Potential cost risks are identified and assessed during the project planning phase. Use probabilistic risk assessment tools to quantify these risks and incorporate them into the project budget as contingencies.

Contingency Reserves: Contingency reserves are established to cover unforeseen costs. These reserves are managed carefully, with clear guidelines on their use to ensure they are available when needed.

Reporting and Communication

Regular Reporting: Providing regular financial reports to stakeholders, detailing cost performance and any deviations from the budget. These reports include insights into cost drivers and recommendations for cost optimization.

Stakeholder Engagement: Continuous engagement with stakeholders ensures transparency in cost management. AECOM maintains open lines of communication to discuss financial performance and address any concerns promptly.

Technology and Tools

Integrated Cost Management Systems: AECOM employs integrated cost management systems that combine budgeting, forecasting, and reporting functions. These systems facilitate seamless data flow and provide a comprehensive view of project finances.

Data Analytics: Advanced data analytics tools are used to analyze cost trends and predict future financial performance. This proactive approach helps in making informed decisions to keep the project within budget.

03. Project Understanding and Approach

Project Understanding

AECOM has assembled a team of technical experts with significant experience in solar projects to prepare the required deliverables in the RFP for up to nine (9) project locations. AECOM understands that the nine site locations are as follows:

A. Bus Division and Maintenance Buildings
    1. Imperial Avenue Division (IAD)
    2. Kearny Mesa Division (KMD)
    3. South Bay Division (SBD)
    4. East County Division (ECD)
    5. Copley Park Division (CPD)

B. Buildings A/B/C and Mills Building with Carpark
    6. Bldg. A, B, C, Mills Bldg and Carpark, Pyramid Bldg

C. Trolley Station and Transit Centers
    7. Iris Transit Center (ITC)
    8. Otay Transit Center (OTC)
    9. El Cajon Transit Center (ECTC)

AECOM understands that the information for each of the sites may need to be updated as further information is received, including environmental, topographical, and geotechnical information. Additionally, sites may need revisions as the amount of area available for the project may change over the period of performance. The scope will be completed separately for each of the nine sites identified above.

Project Approach

Task 1: Project Management and Coordination

Project Management and Coordination approach is designed to ensure the successful delivery of projects by employing robust methodologies, collaborative strategies, and a focus on quality, cost, and time management. Below is a summary of our approach:

Project Execution Plan (PEP)

The team develops a comprehensive Project Execution Plan (PEP) that serves as a roadmap for the successful delivery of a project. This plan outlines protocols for meetings, reporting, and coordination with the project team and establishes procedures for managing design, cost, and construction phases, ensuring alignment with the client's objectives and project requirements.

Kick-Off

The PRE & AECOM's team effort begins with a Kick-Off Meeting with MTS after receiving a Notice to Proceed and awarded contract documents. At this time, the team will present a Preliminary PEP and seek feedback from MTS to establish the accepted baseline schedule.

As defined in the RFP, there will be two distinct phases of work (desktop and detailed analysis). In addition, the first phase of the team's effort will also focus on establishing program administration, setting transparent communication avenues, and regular interactions between MTS, PRE, AECOM, and stakeholders to ensure project success. With the repeatable process of site screening and assessments described in the following phases, we will clearly define the most efficient process for identifying successful opportunities for solar deployment in City-owned properties. The team sees the longevity and future benefit of creating a streamlined process for widespread and equitable access to solar renewable energy.

Project Coordination

PRE's Project Manager Eric Roe and AECOM's project manager **Guilherme Gallon** will be responsible for arranging and documenting monthly project meetings to ensure effective communication and progress tracking. These meetings will serve as a platform to review the status of deliverables, address emerging risks, and discuss cost and schedule updates. The team is available for both virtual and onsite meetings, when feasible and possible, to maintain flexibility and accessibility.

Virtual meetings will be conducted via MS Teams or another agreed communication platform, while onsite meetings will provide opportunities for in-person collaboration.

Technical Approach

AECOM employs a comprehensive and methodical approach to solar and energy analysis, leveraging advanced tools and multidisciplinary expertise to optimize renewable energy solutions. Below is an overview of our methodology:

1. **Feasibility Studies**:
   AECOM conducts detailed feasibility studies to evaluate the technical and economic viability of solar PV installations. This includes site assessments, shading surveys, and infrastructure reviews. Using industry-standard tools like PVSyst, or equivalent, we model energy generation, efficiency, and shading losses to produce accurate energy yield estimates. These studies help identify the most suitable sites and configurations for solar installations.
2. **Energy Modelling**:
   AECOM develops energy models that incorporate site-specific data, such as solar profiles, demand patterns, and shading considerations (using software Solar Anywhere). These models allow us to analyze energy generation, self-consumption rates, and reductions in grid electricity imports. For hybrid systems, we also model battery energy storage systems (BESS) to optimize energy utilization and grid connection.
3. **Financial Modelling**:
   AECOM performs high-level financial appraisals to estimate capital expenditure (CAPEX), operational expenditure (OPEX), and revenue from avoided import costs and export opportunities. We calculate key financial metrics such as internal rate of return (IRR), net present value (NPV), and payback periods over a typical 25-year lifespan. This analysis can be refined using contractor quotes and site-specific details as projects progress.
4. **Preliminary Design**:
   AECOM provides initial layouts and construction plans, including the placement of PV panels, inverters, transformers, and cable routes. These designs also consider temporary laydown areas and access routes for construction. While detailed engineering is not included at this stage, datasheets of main components are provided to establish the design basis.

Deliverables:

- **Project Execution Plan** – At the project Kick-Off meeting, AECOM will provide an initial project execution plan, which will include a baseline schedule, representing project milestones and deliverable dates required to achieve MTS's stated completion date.

Task 2: Solar and Energy Analysis

Desktop Assessment

AECOM will review the viability of various solar photovoltaic (PV) generation technologies on the nine (9) facilities identified in Project Understanding section. In addition to reviewing data sources provided by MTS for each location and best practices.

Building Analysis

AECOM will generate preliminary layouts for each site based on site constraints and setbacks required to comply with locally adopted zoning and fire codes. These layouts will then be used in a desktop analysis of each site to generate site specific production estimates. Production estimates will be generated with industry standard modeling software, Helioscope (Appendix, A), using site specific climatic data, layouts, and shading. Generic, typical equipment will be selected for each site model based on the service voltage and roof/canopy/ground mount present. This will allow for a basis of comparison between the sites.

Site analysis will be paired with the data provided by MTS to perform an initial Solar PV and BESS feasibility review of MTS's administration facilities. Criteria will be weighted/ranked according to guidance provided by our team of experts and MTS feedback and desires. This will be an iterative process where the criteria are weighted and then combined into a cumulative suitability surface that will be used to score each potential PV location on its suitability.

Rooftop Criteria

AECOM will use the following siting criteria to assess building feasibility for Rooftop systems. Provided drawings and other documents representing the existing facilities as well as publicly available data (e.g. Google Earth, GIS data sets) will be utilized as the basis for the reviews.

- Annual building energy load data
- Zoning regulations and fire codes
- Roof area and direction (aspect)
- Roof characteristics and conditions
- Shading from trees and other obstructions

Canopy or Carport Criteria

AECOM will use the following sitting criteria to assess impervious areas that are candidates for PV carports. Provided drawings and other documents representing the existing facilities as well as publicly available data (e.g. Google Earth, GIS data sets) will be utilized as the basis for the reviews.

- Zoning regulation
- Current and future roof canopy area
- Parking facility layout
- Shading from trees and other obstructions
- Availability of electrical interconnection
- Parking facility condition

Ground-Mounted Criteria

AECOM will use the following siting criteria to assess candidates for Ground-Mounted systems. Provided drawings and other documents representing the existing facilities as well as publicly available data (e.g. Google Earth, GIS data sets) will be utilized as the basis for the reviews.

- Zoning regulation
- Parcel Size availability
- Hydrologic features, including wetlands, streams, drainage, and floodplain.
- Proximity to Protected areas, conservation areas, The Nature Conservancy's key wildlife protection areas for solar.
- Proximity to Degraded lands, including brownfields, capped landfills, and remediated areas.
- Shading from trees and other obstructions
- Site topography

Battery Energy Storage System (BESS) Feasibility

AECOM will research viable storage technologies for each location. A comparative analysis of different technologies will be completed. This will be based on available data such as battery use, peak shaving, demand response, emergency backup, location, space constraints, BESS required fire protocols, and economics. AECOM will seek available data from MTS for each building that may include:

- Utility tariff details
- Site layout and any related information regarding local space constraints or required setbacks.
- Any information available related to critical loads apart from the standard backup load requirements from local code.

Where site specific data is lacking, AECOM will utilize available databases as well as industry standards to fill in missing information and make other general assumptions on facility condition, energy use, etc. as needed.

AECOM will summarize the region's local utility rate structures available in the area that can provide additional financial benefits by integrating a battery storage system. This preliminary appraisal of a battery storage system will only include grid-interactive operation and will not consider other benefits (e.g., resiliency). Eligibility for desirable utility tariffs will be included in the screening process to identify sites that may benefit from the addition of a battery storage system.

Deliverables:

- Summary of Report and Estimates.

Assumptions:

- AECOM will prepare an RFI and expects collaboration as quick response from the Client. Data requested will include, for each facility, but is not limited to, energy bills, as-built drawings, electrical plan, energy consumption growth, etc.

Task 3: Electrical and Structural Analysis

This task kicks off with a Site Visit at each of the nine facilities (or less if any is deemed not suitable), analyzing and documenting environmental, electrical and structural components. Based on the results from the site visit, AECOM will refine the results from Task 2, which will be further analyzed for their economic feasibility in Task 4.

Site Visit

AECOM will visit the selected facilities for structural and electrical assessments. The site visit consists of visually inspecting and photographing the site/building conditions (no testing activities).

- **Electrical Analysis**
  An evaluation of the building's electrical systems will be conducted, utilizing existing drawings and current field conditions, to ascertain the adequacy of the existing system and identify necessary modifications and improvements. To comprehensively assess potential conduit routing paths within existing structures, access to electrical rooms or other areas restricted to qualified personnel is crucial. Should access to these areas be unavailable during site visits, the design process will include assumptions about conduit routing from the building's exterior to its interior. However, it will not provide details or insights into conduit routing through interior spaces.
- **Structural Analysis**
  AECOM will provide engineering analysis on the structural integrity of each rooftop and evaluate adding carport structures to support solar panels in the open parking areas based on existing drawings, as-built drawings, and information gathered during site visits. AECOM will perform a structural assessment of the existing roofs with the expected additional forces of the proposed solar panels and associated infrastructure for the current applicable building codes. AECOM will assume that the additional proposal solar panel forces are less than 5% of the original design dead loads. AECOM will use the solar layouts provided in Task 2 to estimate the expected load of solar panels.

Revised Site Layout and Performance Estimate.

Building upon results from the Site Visit and Electrical and Structural analyses, AECOM will refine the Solar and Energy analysis, making the necessary adjustments in terms of structural and electrical constraints. Additionally, AECOM will provide recommendations on the likely electrical and structural modifications.

Deliverables:

- Summary of Report and Estimates.

Assumptions:

- AECOM will prepare an RFI and expects collaboration as quick response from the Client. Data requested will include, for each facility, but is not limited to, energy bills, as-built drawings, electrical plan, energy consumption

growth, etc.

- Access to all facilities will be granted and an electrician will be escorting the team to open all electric cabinets and systems.

Task 4: Economic, Feasibility, and Financing Analysis

AECOM will conduct a cost estimation, feasibility and financing analysis for each of the nine locations indicated by MTS. Our estimates will include the price per watt, total installation costs, and estimated tax credits for each facility.

Following the cost estimates, AECOM will calculate potential cost savings by estimating annual electricity generation and the offset in electricity costs. This assessment will consider factors like location, weather, and solar panel type, with electricity costs sourced from utility companies or the Energy Information Administration (EIA). We will also project electricity cost escalation based on EIA data.

Our cost-benefit analysis will evaluate the project's lifetime, considering inflation rates of 1%, 2%, 3%, and 5%. The analysis will highlight the anticipated payback period and return on investment (ROI), providing a clear view of the project's financial benefits.

Deliverables:

- Summary of Report and Estimates.

Assumptions:

- AECOM will prepare an RFI and expects collaboration as quick response from the Client. Data requested will include, for each facility, but is not limited to, energy bills, as-built drawings, electrical plan, energy consumption growth, etc.

Financing Analysis Process

- Economic Feasibility and Payback Period
  AECOM conducts a detailed financial appraisal for each solar installation, which includes estimating capital expenditure (CAPEX) and operational expenditure (OPEX) using industry benchmarks and supplier information. We calculate the internal rate of return (IRR), net present value (NPV), and payback periods over a typical 25-year lifespan. This analysis helps determine the economic feasibility of each project and provides realistic project costing forecasts.
- State and Federal Rebate/Incentive Programs
  AECOM identifies and evaluates available state and federal rebate and incentive programs to enhance the financial viability of solar projects. This includes researching and applying for applicable programs that can offset initial costs and improve project returns.
- Electricity Rate Schedules
  We analyze applicable electricity rate schedules to optimize the financial performance of solar installations. This involves understanding the current and projected electricity rates to maximize savings from reduced grid electricity imports.
- Net Metering and Utility Incentives
  AECOM assesses the applicability and cost-effectiveness of net metering and other utility incentives, such as SDG&E's Self-Generation Incentive Program (SGIP). We evaluate these programs to determine their impact on project economics and potential revenue streams.
- Cost of Necessary Upgrades
  We provide estimates for any necessary upgrades related to structural, architectural, or other site-specific requirements. This includes assessing the need for infrastructure improvements to support solar installations and incorporating these costs into the overall financial analysis.
- Recommended Financing Methods
  AECOM recommends financing methods tailored to each project's needs, such as direct purchase, leasing, or Power Purchase Agreements (PPA). We evaluate the benefits and drawbacks of each option to provide clients

with the most suitable financing strategy for their solar projects

Task 5: Preliminary and Final Report Documentation

Preliminary Report (50%)

The 50% preliminary report will summarize the desktop and energy assessment findings for the nine main locations (Task 2) including findings from the site visit and electrical and structural analysis. The energy results will be updated to account for any modifications required (Task 3). The report will include, at minimum:

- General review of solar system technologies and efficiencies.
- Minimum and maximum recommended installation capacity of solar equipment.
- Electrical and Structural feasibility for each of the subject buildings and carports (nine main locations, including all individual areas within each main location). Applicability of integrating the solar system with existing charge management system at Bus Division.
    - Revised generation of energy, given the available space and electrical and structural constraints, including, but not limited to
        - Revised size of the project per facility
        - Revised Solar PV Layout
        - 8760 times series for each of the nine main locations
- Comparison of actual electricity consumption of each facility (Exhibit A) to the optimized system size and output and anticipated electrical savings from solar equipment.
- Energy storage systems (battery storage) and their applicability to each location, and their capability to integrate with existing systems at each site.
- Environmental and California Environmental Quality Act (CEQA) review.
- Recommendations on the necessary electrical and structural modifications.

Assumptions:

- AECOM will prepare an RFI and expects collaboration as quick response from the Client. Data requested will include, for each facility, but is not limited to, energy bills, as-built drawings, electrical plan, energy consumption growth, etc.
- Access to all facilities will be granted.
- An electrician will be escorting the team to open all electric cabinets and systems.
- Structural adequacy will be based on review of existing documentation and visual assessments
- 8760 times series will not include battery storage (BESS) integration.

Final Report

The Final Report will summarize the entire study, including results from Task 4 in addition to the already presented results in the 50% Preliminary Report. The report will include, at minimum:

- Results already presented in the 50% Preliminary Report.
- Comprehensive review of solar system technologies and efficiencies.
- Preliminary schematic drawings/and cost estimates.
- Economic feasibility and financing analysis for each of the nine main locations including:
    - Project costing forecasts.
    - Payback time.

- State and federal rebate/incentive programs.
- Applicable electricity rate schedules.
- Net metering applicability and cost effectiveness or any other utility incentive/subsidy (ex. SDG&E's Self-Generation Incentive Program (SGIP), which includes solar/battery storage installations.

- Rough Order of Magnitude (ROM) cost estimate for the necessary upgrades indicated in Task 3, if any.
- Recommended financing methods.

04. Project Schedule

The PRE & AECOM team employs a robust project management approach to ensure adherence to proposed schedules. Our methodology includes the development of a comprehensive Project Execution Plan (PEP), which serves as a roadmap for project delivery. This plan outlines protocols for meetings, reporting, and milestone tracking, ensuring all stakeholders are aligned from the outset. We also implement a 30- to 60-day lookahead plan, which includes resource deployment, document control procedures, and the establishment of reporting schemes. This proactive planning allows us to identify design milestones, authority approvals, and any potential risks early in the process, ensuring the project remains on track.

AECOM's Earned Value Management (EVM) approach is another critical tool for monitoring progress against the schedule. This method fosters a "no surprises" culture by providing accurate program-level forecasting, enabling clients to make informed decisions regarding financial planning, project approvals, and resourcing. Should any potential issues arise, our team implements contract change management procedures, including Early Warning and Compensation Event mechanisms, to mitigate cost and time impacts.

Project Schedule

In Table 2 below, proposed is a 120-day schedule that meets the requirements as presented by MTS in the RFP. AECOM has extensive experience delivering numerous studies similar in size and scope, and believes the original 120-day schedule referenced in the RFP is a considerably tight turnaround for a project of this size; therefore, we suggest extending the project schedule by 30 to 60 days as a contingency for completing each task and to accommodate any unforeseen circumstances.

Table 2 – Project Schedule

Activity	Weeks															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
NTP																	
K-O Meeting																	
Task 1 - Project Mgmt																	
Task 2 - Solar and Energy Analysis																	
30% Preliminary Report																	
Task 3 - Electrical and Structural Analysis																	
60% Preliminary Report																	
Task 4: Economic Feasibility and Financing Analysis																	
Final Report																	

Local Resources

AECOM's San Diego office is a key component of our Southern California operations, boasting a robust team 370 staff members with extensive capabilities including a solar electrical and structural team to support site walks and/or in-person

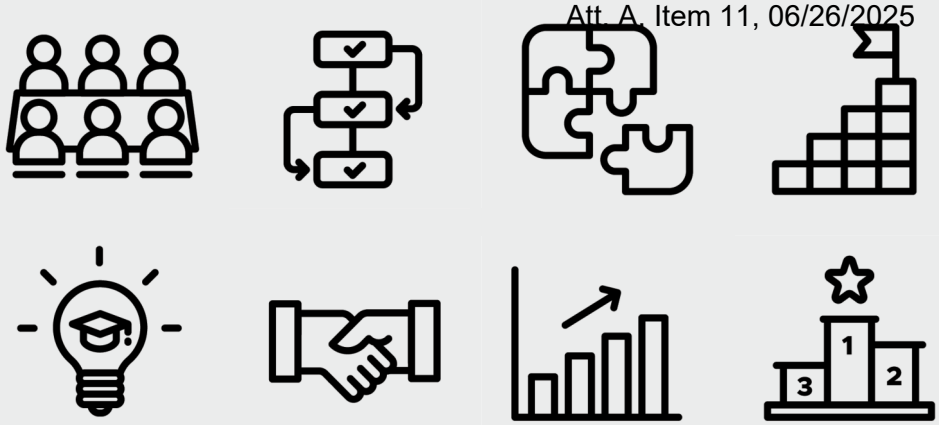
client requests. Our office is well-equipped to handle a wide range of projects, offering innovative solutions and maintaining excellent safety and quality records. Mario Coria, PE, our proposed Deputy Project Manager and Electrical Engineer for the Site Visit is based out of our San Diego office, located at 401 West A Street, Suite 1200, San Diego, CA 92101.

The San Diego office comprises architects, interior designers, engineers, urban planners, landscape architects, strategic planners, and specialists in economics, asset advisory, energy, and high-performance buildings. They are supported by an extensive network providing access to more than 18,000 staff nationwide and 47,000 staff worldwide, allowing us to offer specialized services without needing to source outside providers.

Our San Diego team is known for its proven leadership and commitment to delivering high-profile projects with regional agencies such as the San Diego Association of Governments, Port of San Diego, Caltrans, and the County of San Diego. The team is cross-trained and multi-disciplined, enabling personnel to perform multiple roles on contracts. This flexibility and readiness ensure that our key and support personnel are available and ready to support the MTS and other clients. Our local presence and strong relationships with stakeholders will facilitate the timely delivery of projects, ensuring that we meet and exceed MTS's expectations.

05. DBE Subcontractor Utilization Plan

As the DBE Prime, Pacific Railway Enterprises, Inc (PRE) will be utilized on this project. Our team is led by a small business with the technical support of AECOM. Although there is no established DBE requirement, AECOM is committed to helping PRE develop additional expertise. AECOM will lead the technical work with PRE leading project management with support from AECOM.



ADMIN FACILITY ROOF SOLAR ASSESSMENT PROJECT TEAM RESUMES

SBMF ZEB Team Staff Member
Eric Roe
Guilherme Gallon
Mario Coria, PE
Ivan Welander, PE
Chris Houck
Miguel Contreras
Lovneesh Nigam
Stephanie Ruybal, MSc Eng, PE
Kristin Bernard, PE
Cindy Kinkade

ERIC L. ROE
PROJECT MANAGER

EDUCATION
Bachelor of Science
Electrical Engineering
Rensselaer Polytechnic Institute
Troy, NY

Union Pacific Signal Training - Signalman Curriculum

US Department of Transportation – Transportation Safety Institute – Transit Safety and Security Program Certificate

PROFESSIONAL AFFILIATIONS
Member AREMA
AREMA Committee 39 - Positive Train Control

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619-550-9858

EMPLOYMENT HISTORY
Pacific Railway Enterprises, Inc.: 01/2020 – present

North County Transit District
03/2011 – 12/2019

Union Pacific Railroad
10/2005 – 03/2011

PACIFIC RAILWAY ENTERPRISES, INC.

Eric Roe has worked in the railroad and transit field for 19 years gaining broad experience in railroad signaling, communications, and Positive Train Control. Mr. Roe was North County Transit District's Program Manager for their successful implementation of Positive Train Control. Additionally, Mr. Roe has experience in railroad and transit operations. Mr. Roe's experience gives him a unique perspective of deep knowledge of railroad signaling but also the application and effect on railroad operations.

REPRESENTATIVE PROJECTS INCLUDE:

Sonoma-Marin Area Rail Transit (SMART) – Petaluma North Station, Petaluma, CA: As Signal Design lead, responsible for the railroad signal design modifications to 7 crossing, a new control point with station gauntlet track. Timeframe: January 2023 – May 2023

Riverside County Transportation Commission (RCTC) – Riverside Downtown Metrolink Station At-Grade Crossing, Riverside, CA: As Task Lead, responsible for project management and conceptual design of at-grade crossing improvements for the north platform's existing crossings. Timeframe January 2023 – October 2023

Riverside County Transportation Commission (RCTC) – Perris South Track, Platform and Layover Expansion Project, Perris, CA As Task Lead, responsible for project management and design of wayside signal and pedestrian crossing modifications on Metrolink Operated Tracks. Project includes a new pedestrian crossing, a new control point, and modification of an existing control point and modification of intermediate signals. Timeframe February 2023 – Current

Riverside County Transportation Commission (RCTC) – Perris Valley Double Track Project, Perris, CA: As Task Lead, responsible for project management and design of wayside signal modifications on Metrolink Operated Tracks. Project includes two need intermediate signals, 18 leaving signals on hand throw switches, modifications to two control points. Timeframe September 2023 – Current

Los Angeles Metropolitan Transportation Authority (Metro) Link US, Los Angeles, CA: As deputy project manager supported the railroad signal design of the project, worked with civil discipline concerning planning of phasing of the signal system at Los Angeles Union Station and developed estimates in support of the work. The project is complex in nature, requiring minimal disruption to Metrolink service during construction, which consists of raising the grade on all tracks and rebuilding all platforms. This project is planned to be delivered via CMGC. Timeframe: February 2020 – Current

Los Angeles Metropolitan Transportation Authority (Metro) – Brighton to Roxford Double-Track (Regional Rail), Sun Valley, CA: As task leader supported the railroad signal and communications design of the project, worked with civil discipline concerning planning of phasing of the signal system on the Metrolink Valley Subdivision and developing estimates in support of the work. Project included multiple locations of double track and a new station platform. Timeframe: March 2020 - Current

Los Angeles Metropolitan Transportation Authority (Metro) – Orange Line Pilot Gate, Los Angeles, CA: As Task Lead, responsible for project management and design of grade crossing systems for the Metro Orange Line Bus Rapid Transit pilot location to determine the feasibility of using crossing gates to protect busses on a dedicated right of way. Project included using vital traffic loops to detect buses but not maintenance vehicles operating on the busway. Timeframe: May 2020 – March 2022

Southern California Regional Rail Authority - Wireless Crossing Nearside Station Stop - Southern California Regional Rail Authority, Pomona, CA: Created Federal Railroad Administration (FRA) Test Plan and Test Request for testing of the Wireless Crossing Nearside Station Stop (WCNSS). Supported laboratory testing of WCNSS of On-Board software from the locomotive to the wayside performing all tests from test plan. Supported field testing at Calabash Crossing performing all tests from test plan with test trains. Timeframe: April 2020 – October 2022

MRCOG (Mid-Region Council of Governments of New Mexico) – Positive Train Control, Albuquerque, NM: Responsible for technical support providing submittal reviews and comments for the agency during the implantation of Positive Train Control. Timeframe February 2020 – November 2022

Riverside County Transportation Commission (RCTC) – Moreno Valley March Field Double Track, Riverside, CA: As Task Lead, responsible for project management and design of wayside signal and pedestrian crossing modifications on Metrolink Operated Tracks. Project included design of 3 control points, 5 intermediate signal locations, and 1 pedestrian crossing. Timeframe January 2020 - Current

Riverside County Transportation Commission (RCTC) – Coachella Valley Special Event Train Platform, Indio, CA: As Task Lead, responsible for project management and design of wayside signal modifications on Union Pacific Owned Tracks. Project included design of new electrically locked switch location and removal of existing switch. Timeframe February 2020 - August 2020

Riverside County Transportation Commission (RCTC) – Riverside Downtown Metrolink Station Track and Platform, Riverside, CA: As Task Lead, responsible for project management and conceptual design of wayside signal modifications of BNSF Owned Control Points. Project included design modifications for new station platform and Customer Information Systems on the platform. Timeframe February 2020 – December 2020

North County Transit District (NCTD) – Positive Train Control, Oceanside, CA: As Program Manager, responsible for delivery of NCTD's Positive Train Control Program. The Positive Train Control program consisted of 21 vendor implemented projects including the installation of fiber optic cable along the entire Right-of-Way, replacement of relay control points with microprocessor controlled control points, installation of Wayside Interface Units (WIU), radio spectrum, Centralized Traffic Control System, and the Positive Train Control Vendor-Integrator. NCTD has 4 tenant railroads which needed to be integrated with NCTD's PTC System. Mr. Roe interfaced with all tenant railroads, the Federal Railroad Administration (FRA), and the California Public Utilities Commission (CPUC). NCTD's Positive Train Control Projects was one of only 4 in the nation to meet full implementation of the December 2018 deadline. Timeline: August 2012 - December 2018

Amtrak – Carlsbad Double Track Project, Carlsbad, CA: As NCTD's Manager of Signal, responsible for ensuring contractor installed equipment conformed to NCTD standards and ensure in service tests conformed with NCTD and FRA Standards. Coordinated with operations on test trains for in service crossing testing. Timeframe April 2011 – January 2012

North County Transit District (NCTD) – San Diego Quiet Zone Project, San Diego, CA: As NCTD's Manager of Signal, responsible for ensuring contractor installed equipment conformed to NCTD standards and ensure in service tests conformed with NCTD and FRA Standards. Coordinated with operations on test trains for in service crossing testing. Timeframe: April 2011 – November 2012

AECOM

Guilherme Gallon

Technical Project Manager

Education
MS, Mechanical Engineering (Renewable Energy), Universidade Federal do Rio Grande do Sul, 2019

BS, Mechanical Engineering, Universidade Federal do Rio Grande do Sul, 2015

Years of Experience
With AECOM: 2
With Other Firms: 8

Licenses
CREA-RS 212409
Conselho Regional de Engenharia e Agronomia (Regional Counsel of Engineering and Agronomy)

Languages
English, Spanish, Portuguese

Areas of Expertise
Wind farm design and operation
Wind turbine (WTG) suitability and site conditions
Wind resource and energy assessments
WTG layout optimization and technology
WTG Root Cause Analysis
Project Management

Mr. Gallon is a Technical Project Manager at AECOM for the Energy department. He has over 10 years of experience in the renewable energy sector and supports AECOM wind, solar, hydrogen, and electrification projects by providing technical expertise and project management.

Guilherme has over 10 years of experience in renewable energy, specializing in wind resource analysis, energy yield assessments, wind farm performance analysis, and RCA of WTGs failed components. His expertise extends to field inspections, encompassing a comprehensive understanding of WTG technology, including the manufacturing process of several WTG components, particularly blade manufacturing.

He is currently working on projects for the development of both onshore and offshore wind and with the decarbonization of the energy system involving the power, industrial and transportation sectors through renewables, electrification, hydrogen and carbon capture technologies.

Selected Project Experience

City of Palo Alto, California. Team member of a power line upgrade for the City of Palo Alto, responsible for the site visit and inspection of the power line poles and their current state. 2025

City of Detroit, Illinois. Deputy Project Manager of an EV Fleet electrification study of over 2,500 vehicles. Guilherme is currently supporting the team on keeping the project within schedule and budget. 2023

SMART, Michigan. Project Manager of a facilities assessment to investigate potential solutions to a Zero Emission Fleet Plan Alternative Fuel Analysis. AECOM is assisting the Client with choosing a suitable micro-scale renewable energy generation alternative to offset their emissions and increase resilience in their system. After a thorough analysis and discuss with the Client, Solar PV arrays are being evaluated both for rooftop and canopy (at parking lots). Ongoing project. 2024

Confidential Client, New Hampshire. Team member of an electrification plan for the Manchester-Boston regional airport, responsible for the mitigation options to reduce peak load due to charging of vehicles, airplanes and airport equipment. 2023

Brookfield, USA. Project Manager of a portfolio of Solar PV projects (over a dozen) spread across several states within mainland USA. The Client is acquiring projects from a developer and seeks AECOM's assistance with Due Diligence and Owners Engineering work. Ongoing project. 2024

Confidential Client, California. Project Manager and technical writer of a site selection process for a biomass-to-hydrogen facility, with carbon capture, in California. The goal was finding a suitable location for the facility while considering capital and operational costs and the feasibility of the project. 2023

Union City, California. Project Manager of a Solar PV replacement project for the Union City Sanitary District. AECOM is assisting the Client with the replacement strategy, from the evaluation of the current Solar PV array to the design of the new Solar PV array and preparation of documents for approval. Ongoing project. 2024

Confidential Client, California. Project Manager of a pre-feasibility analysis for the implementation of either or both Solar PV and BESS in California. A hybrid option (PV+BESS) is also being considered. Ongoing project. 2024

SDG&E SUG Program, California. Mr. Gallon developed a solid procedure for subcontractors' time keeping and invoicing, saving the team hundreds of hours in Project Controls, ensuring compliance with the client requests and guaranteeing subcontractors' satisfaction on payment schedule. 2024

Confidential Client, California. Deputy Project Manager and Technical Lead for a wind measurement campaign in California. A remote sensing device (LiDAR) was deployed at a confidential location and served as input for the wind resource characterization. An energy assessment has been carried out subsequent of the measurements. 2023-2024

SMUD, California. Project Manager and technical lead for an upgrade campaign of meteorological towers at Solano wind farm. The wind farm is being repowered with larger turbines and requires the installation of taller met towers to comply with CAISO regulations. 2023-2024

Canadian National Railway, Illinois. Mr. Gallon supported the team in the development of a renewable energy generation strategy for a water treatment facility in Illinois. The goal was to offset their energy bill with local generation from solar and/or wind resources. Guilherme led the wind analysis and the procurement of small-scale wind turbine suppliers. 2022

Orsted, California. Mr. Gallon supported the team in the preliminary transmission and permitting study for the Morro Bay and Humboldt Wind Lease Areas (WEA) by providing expertise on the wind resource and energy production potential for each WEA. The expected daily and annual production profiles were also taken into account to better understand the capacity needs for each transmission line. 2022

Confidential Client, Blade Factory Inspection, Fortaleza, Ceará, Brazil. Quality control inspector responsible for visiting and auditing a blade factory in Brazil. The visit was specific to the Vestas V150 blade assembly line of the factory. Guilherme participated in meetings with the factory team and reviewed documentation and procedures related to a specific blade model followed by a site visit in the assembly and production areas of the factory. [Prior to AECOM] [3/2021 - 6/2021]

Confidential Client, Nacelle Factory Inspection, Fortaleza, Ceará, Brazil. Quality control inspector responsible for visiting and auditing a nacelle factory located in Brazil. The visit was specific to the Vestas V150 nacelle assembly line of the factory. Guilherme participated in meetings with the factory team and reviewed documentation and procedures related to a specific turbine model followed by a site visit in the assembly areas of the factory. [Prior to AECOM] [3/2021 - 6/2021]

Confidential Client, Wind turbine Overspeed Root Cause Analysis, João Câmara, Rio Grande do Norte Brazil. Project manager and main technical resource for the investigation of a Vestas V110 wind turbine overspeed event which culminated in the break of all blades and the drivetrain. Guilherme delivered a solid and detailed root cause analysis report depicting the root causes of the catastrophic event. The report proved that the O&M team has failed to service the turbine appropriately and this culminated in the overspeed event and subsequent failure. The RCA report was used to leverage the insurance company's negotiation with the O&M and saved them over $1M. [Prior to AECOM] [12/2020 - 7/2021]

Confidential Client, Visual Inspections, Bahia, Brazil. Wind turbine inspector performed turbine visual inspections on four Acciona wind turbines as part of a M&A process. [Prior to AECOM] [6/2020 - 10/2020]

Confidential Client, Visual Inspections, Uruguay. Performed visual inspections of six Vestas V110 wind turbines located in Uruguay as part of a continuous monitoring of the wind farm. [Prior to AECOM] [5/2019 - 6/2019]

Confidential Client, Visual Inspections, Uruguay. Performed visual inspections of three Gamesa G114 wind turbines located in Uruguay as part of a technical due diligence process. [Prior to AECOM] [5/2019 - 6/2019]

Confidential Client, Visual Inspections, Spain. Performed visual inspections of three Vestas V90 wind turbines located in Spain as part of a technical due diligence process. [Prior to AECOM] [2/2020 - 3/2020]

AECOM

Mario Coria, PE
Project Manager

Education
Bachelor of Sciences in Electrical Engineering, San Diego State University
University of California San Diego Power Systems Engineering Certificate, 2017

Years of Experience
With AECOM: < 1
With Other Firms: 23

Registrations/Certification
Professional Engineer License, CA 20809 EIT #109228
Certified Engineer Manager (CEM) 2020
Notary Public-California, commission # 2103463
Security Clearance (SECRET)
CONUS/OCONUS Unrestricted Travel

Mr. Coria has extensive experience in electrical engineering design, design of utility scale/commercial photovoltaics (PV) solar projects, substation design with strong 3Ø, equipment selection, calculations, and installation. His experience includes project engineering management from sales efforts to construction and operations with technical support.

Mario's work also includes electrical design using Power World, ETAP, Arch Flash, Short Circuit, protection coordination studies, power flow studies, load calculations, conductor sizing, raceway fill, steady state and transient voltage drop, and storage energy systems. He also has experience with MV and LV power equipment; switchgear, panelboard, transformer, panel schedule, MCCs. O-Calc, NEC, AutoCAD, NFPA 70E, PVSyst.

Selected Project Experience

AECOM, San Diego, California. Project Manager, Electrical Engineer, Energy. Assist customers in the engineering process of their grid tie utility scale and commercial PV Solar projects. Engineering due diligence, feasibility studies, location/site evaluation, point of interconnection infrastructure assessment, pre-construction documentation reviews, support AHJ permitting efforts, energy studies, review of engineering drawings (IC, IFP, IFC), construction life-cycle reports review, commissioning test reports review, onsite inspection of projects during all stages of construction. Deputy project manager for PV Solar/Battery Storage Energy System projects. Proposal cost and schedule.

Novel Energy Solutions, Chula Vista, California. Senior solar PV design engineer. Design of 1MW and above solar PV power plants in the U.S. [Prior AECOM]

CONUS/OCONUS, Risk Mitigation Consulting, Chula Vista, California. Senior electrical engineer. Mission assurance assessments for Navy and Marines installations task critical assets utility supporting infrastructure. Implemented utility and mission analysis of DoD, DON, DCIP, and master planning for utility systems. [Prior AECOM]

National Engineering & Consulting, Lake Forest, California. Electrical engineer. Commercial power systems design engineering for construction documents, lighting and controls (Title 24), electric power equipment distribution, calculations for project deliverables. [Prior AECOM]

Independent Energy Solutions, Vista, California. Senior project design engineer. Design utility scale and commercial PV Solar projects in southern California. [Prior AECOM]

ABB, Field Service Engineer Level III, California, Chile. Supervise, service, and commission utility scale inverters in >500MW PV solar plants in California, SOLARSTAR (Sunpower), TOPAZ (First Solar) and Chile, el Salvador PV Solar plant (SunPower). [Prior AECOM]

Herca Solar, Oceanside, California. Engineering manager. Engineering manager for commercial and residential solar PV projects. Supervise residential solar projects. Design and implement commercial solar projects. Site evaluation assessment for commercial. Building where we review and analyze electrical main service panel for compatibility with the new loads and equipment. [Prior AECOM]

Mario Coria, PE

CG Power Solutions, PV Solar Projects, California, Arizona, and New York. Design, engineering, construction management, and commission of 23MW AC IVSC I (Imperial Valley Solar Company I) located in Niland, CA. [Prior AECOM]

REC Solar, PV Projects. Design engineer. Manage and design commercial/residential solar energy systems in San Diego and Orange counties. Responsible for quality of design site valuations, layouts, plans, jurisdiction permits, system performance, electrical performance, production, design, rebate process/mechanical design, and permitting process. Provide engineering support to engineers, sales, customers, and electricians. Trained of electricians and installation crews. Create BOM, engineering processes and new product implementations. Commercial buildings assessment studies for electrical equipment compatibility with new PV Solar equipment. [Prior AECOM]

AECOM

Ivan Welander, PE

Electrical Engineer

Education
BS, Electrical Engineering, University of Wisconsin, Madison, 2014

BS, Biological Aspects of Conservation, University of Wisconsin, Madison, 2003

BS, Botany, University of Wisconsin, Madison, 2003

Years of Experience
With AECOM: 8
With Other Firms: 5

Areas of Expertise
Renewable Energy

Energy Storage

Substation Engineering

Transmission & Distribution

Power Systems Engineering

Protection & Control

Registrations/Certifications
Registered Professional Engineer, California (Electrical, #22245, 2017); Michigan (#6201070082, 2020 LAPSED); Minnesota (#58250, 2020); New York (#105108, 2021); Utah (#12921410-2202, 2022)

NFPA 70E Electrical Safety in the Workplace Training

AECOM Field Safety Training

PG&E Hydro Field Safety Training

MREA PV Site Assessor Training

Professional Affiliations
Member IEEE Power & Energy Society

Mr. Welander is an electrical engineer who brings an analytical and open-minded approach to all power engineering projects. He joined AECOM's Energy business line to share project expertise spanning transmission, distribution, substations, and renewable energy.

Ivan has been a key contributor on many projects at AECOM particularly in engineering and design for renewable energy projects such as solar photovoltaic , wind power, and battery energy storage, as well as hydroelectric generation, substation, transmission, and distribution. His project work includes power systems studies, interconnections, project feasibility studies, owner's engineer services, detailed design for construction, and other electrical engineering services.

Selected Project Experience

SunPower Corporation, Solar Photovoltaic (PV) and Energy Storage Electrical Design and Engineering, John F Kennedy Airport, New York, NY. Electrical Engineer, provided electrical design and engineering for a 10MWac solar PV carport system and 7.5MW/25MWH energy storage at JFK airport. Project interconnections included both new service for export to ConEd and integration with JFK's existing 13.8KV AirTrain system. Provided electrical plans and specifications for PV/ESS and MV distribution, short circuit, coordination, and arc flash studies, system protection design for export/non-export, and construction support.

Goldman Sachs Renewable Power (GSRP), Owner's Engineering, Various Locations, Nationwide. Electrical Engineer, provided owner's engineering support across a large portfolio of renewable and energy storage projects with a focus on substation and transmission design reviews. Reviewed contracts, drawings, specifications, studies, submittals, testing, commissioning, and energization plans for best practice and compliance with industry standards and contract documents.

Enel Green Power, Cascade Energy Storage Project, Stockton, CA. Electrical Engineer, provided substation and facility design for a 50MVA battery energy storage system interconnection to the CAISO controlled grid. Design included a 60kV-34.5kV project substation and 60kV gen-tie to interconnect at the adjacent PG&E Weber substation.

Engie North America, Inc., Renewable Projects Owner's Engineering, Various Locations. Electrical Engineer, provided owner's engineering support for two solar PV project substations 60MVA, 115kV-34.5kV and 60MVA, 70kV-34.5kV respectively. Reviewed drawings and studies for best practice and compliance with industry standards and contract documents. .

San Francisco Public Utilities Commission, San Joaquin Pipeline Solar Project, Oakdale, CA. Electrical Engineer, provided owner's engineering technical support for a grid-tied solar PV with battery energy storage backup retrofit project to provide power for critical infrastructure at three remote water supply facilities for SFPUC.

San Francisco Public Utilities Commission, Bay Corridor Transmission and Distribution Project, San Francisco, CA. Electrical Engineer, acted as owner's engineer for SFPUC in the development of new 230kV and 12.47kV transmission and distribution systems. In conjunction with the client and a multi-discipline project team, developed conceptual designs and basis of bid documents for a 230kV-12.47kV substation, including 62.5MVA power transformers, 230kV GIS, and 12.47kV switchgear, as well as underground transmission and distribution plans. Provided OE review for design-build contracts and construction support.

Salt Lake City Department of Public Utilities, Wastewater Treatment Plant Design and Construction Management, Salt Lake City, UT. Electrical Engineer, provided detailed design and engineering for a new 138kV-13.8kV substation for interconnection with RMP as part of a large wastewater treatment plant redesign. Design included incoming 138kV transmission takeoff, instruments, disconnects, and circuit breaker, 20MVA power transformer, 13.8kV switchgear, station grounding, lightning protection, control building and station auxiliaries.

U.S. Army Corps of Engineers Detroit District, Soo Locks Duct Bank and Feeder Replacement, Sault Ste. Marie, MI. Electrical Engineer, led electrical design and engineering for the demolition and replacement of an existing 13.8kV low pressure gas-filled, lead-covered feeder cable system interconnecting the locks and hydro-generation facility to the local utility. The new installation included a new duct bank and manhole system, new 13.8kV feeders and integration with existing cable systems and tunnel infrastructure. In close coordination with USACE and multi-discipline project team, developed a design criteria report, detailed engineering plans and specifications.

Friant Power Authority, Transformer Procurement, Friant, CA. Electrical Engineer, provided technical specifications, procurement support, and bid evaluation with transformer loss comparison, for the procurement of a new 35MVA 70kV-6.6kV power transformer to replace existing single phase transformers.

Friant Power Authority, Transformer Condition Assessment, Friant, CA. Electrical Engineer, provided a technical evaluation and condition assessment of several single-phase 70kV-6.6kV power transformers based on field inspections and testing per IEEE standards. Provided test specifications and oversight of testing subcontractors. Interpreted test results and made recommendations for the existing installation based on transformer condition.

Engie North America, Inc., Substation Expansion Conceptual Design, Confidential Location, CA. Electrical Engineer, prepared a conceptual design to expand an existing 230kV substation for a proposed 90MW solar PV generation interconnection.

Bay Area Rapid Transit, Traction Power Substation Replacement, Bay Area, CA. Electrical Engineer, performed design review of traction power substation replacements and provided grounding system design and calculations per IEEE 80 for several 34.5kV traction power substations using SES CDEGS.

Beale Air Force Base, Substation Replacement, Marysville, CA. Electrical Engineer, provided detailed physical and electrical design and engineering for the replacement of an existing substation with a new 60kV-4.16kV substation. Design included re-alignment of two 60kV lines, 60kV four-position ring bus, two 60kV-4.16kV power transformers, 4.16kV switchgear, distribution, instrumentation, protection and controls, grounding and lightning protection.

Confidential Client, Wind & Solar Interconnections, Various Locations. Electrical Engineer, prepared interconnection requests for several utility scale wind and solar PV projects. Produced site plans, single line diagrams and application documents.

Enel Green Power, Rattlesnake Creek Wind Project, Dixon County, NE. Electrical Engineer and owner's engineer, provided review of 340MVA, 230kV-34.5kV wind generation substation and protection system plans for interconnection with Nebraska Public Power District. Provided on-site substation energization support.

U.S. National Aeronautics and Space Administration (NASA), Ames Research Center, Substation Buildout, Mountain View, CA. Electrical Engineer, provided detailed design and engineering services on the expansion of a 115kV substation. Project work included physical, electrical design and construction engineering support for a new 115kV bay with gas-insulated circuit breaker, 30MVA step-down transformer, 27kV switchgear, and 27kV distribution off-site.

Pacific Gas and Electric Company (PG&E), Pit River Powerhouse No. 4 Electrical Updates, Burney, CA. Electrical Engineer, prepared feasibility reports and provided detailed engineering services for PG&E's hydro power group to replace 13.8kV air blast circuit breakers with new arc-resistant switchgear, and other powerhouse upgrades. Recommended best options, provided cost estimates, specifications, and contributed to construction drawings.

AECOM

Chris Houck

Project Designer

Education
BS, Mechancial Engineering, Rutgers Universit

BS, Sustainable Resource Management
Minor in Green Building & Community Design, University of Vermont

Years of Experience
With AECOM: <1
With Other Firms: 10+

Registrations/Certifications
OSHA 30 Hour
Advanced Solar PV 40 Hour

Areas of Expertise
PV
Batery Energy Storage
Helioscope
PV Syst
NEC Knowledge
Sketchup Pro
AutoCAD

Mr. Houck is an innovative and knowledgeable project designer with 10+ years of experience in the energy field working on commercial, industrial PV, and battery energy storage systems as well as Electric Vehicle charging stations (EV). He brings a strong background in low and medium voltage grid systems.

Chris has also served as a portfolio manager for large name brand companies, delegating designs, equipment procurement, project timelines, and multi-department iterations to complete projects.

Selected Project Experience

Portfolio Manager

HEB, Texas, United States. Responsible for 40+ MW of roof projects. Oversaw program for 5 years. (Prior to AECOM)

Home Depot, East Coast, United States. Responsible for 5MW of projects. Oversaw Program for 2 years. (Prior to AECOM)

Whole Foods, East Coast, United States. Responsible for 1.5 MW of projects. Oversaw program for 1 year. (Prior to AECOM)

Notable Micro Grid Systems

TVA, Paducah Solar & BESS Project, Paducah, Kentucky.

Project Design Lead of all teams for the 90% detailed design of a 114MW DC / 95MW AC PV system and a 100MW/400MWh BESS system, including MV Collection and SCADA systems, interconnecting directly at the TVA Shawnee Fossil Plant. (2023) (AECOM)

Vieques Island, Puerto Rico, Confidential Client. Lead Designer for conceptual Microgrid drawings of a 20MW DC PV and 12MWh Battery Energy Storage system, including a 15kV E-house substation. (Prior to AECOM)

Confidential Client, Lanai, HI Lead Designer for conceptual Microgrid drawings of a 10MW DC PV array and 9MWh Battery Energy Storage System. Including plans to interconnect directly at the utility substation. (Prior to AECOM)

Confidential Client, Molokai, HI Lead Designer for conceptual Microgrid drawings of a 2MW DC PV array and 800kWh Battery Energy Storage System to interconnect ahead of client loads and net meter to client while supplying utility directly. (Prior to AECOM)

Notable Ground Mounted PV Systems

Ulster County Landfill PV Array, Kingston, NY, Lead Designer, for late-stage redesign of the permit and construction drawings package for a 1.9MW DC ground mount PV system, Oversaw project design changes and RFI's until projects PTO. (Prior to AECOM)

Montgomery County - Oaks Landfill PV Initiative, Gaithersburg, Maryland. Took over as lead designer for a preliminary and permit drawings set of a 5.8MW DC PV Ground mounted array on the closed county landfill. Preliminary drawings moved into Permit drawings and then were sold to EPC at 60% level design for further development. (Prior to AECOM)

Baltimore County Brownfield PV Array, Baltimore, MD. Assistant Designer of the preliminary drawings of a 12MW DC PV array to go on Baltimore county's Southwest area park, Brownfield. (Prior to AECOM)

County of Dutchess PV System, Dutchess, New York. Lead designer on a 2.498MWDC PV array interconnected at 34.5KV. Designed the array with 4 different orientations to accommodate for landscape challenges, such as, protected wetlands and shallow bedrock. Performed glare study due to PV array's proximity to the Hudson Valley Regional Airport. (Prior to AECOM)

Public Works PV Array, Broome County, New York. Took over as lead designer and provided Support for a 5.2 MW DC PV Ground mount array. Interconnection occurred at 12.47kV with a new service brought through by the utility. (Prior to AECOM)

Tri County Energy Consortium, Latham, New York Assistant designer of a 2.5MW DC PV Ground mount array. Project was designed to a 90% level and sold to an EPC for further development and build. (Prior to AECOM)

Town of Branford, Connecticut, Tabor Solar PV System. Provided Design support for 1.37MW DC PV solar tracking system. (Prior to AECOM)

Notable Roof mounted PV systems

TESLA Fremont Factory PV Project. Fremont, CA. Lead designer of a 500kW roof mounted PV array on top of the Tesla Automotive manufacturing plant. Created permit and construction drawing package. Oversaw project progress to PTO. Site walked entire factory to identify an acceptable point of interconnection that would not interfere with ongoing manufacturing load demands as well as identify a roof that would not require major upgrades or reinforcements to install the array. (Prior to AECOM)

AMAZON-Windsor PV Project, Morristown, NJ Designed preliminary contract and 50% permit drawings for a 3.8MW DC Roof mounted PV array on the amazon distribution center. Provided glare study and lightning protection grid in design. Interconnection plan at (2) 5kV Switchgears to distribute load. (Prior to AECOM)

Home Depot, Multiple Projects. Lead designer for over 1MW of DC PV roof mounted projects for Home Depot such as store #1861, 1245, and 6613. (Prior to AECOM)

Notable Canopy PV Systems

University of the Pacific Renewables Project. Stockton, CA Designed the permit and construction package for a 5.298MW DC PV carport array and 3MWh Battery Energy Storage System along with 8 electric vehicle charging stations. The site covered 8 different parking lots with 10 different points of interconnection. Integrated BESS system into substation controls. Assisted in the creation of the PV telemetering system. (Prior to AECOM)

Chino Valley Unified school district, San Bernadino County, CA. Designer and assistant portfolio manager for multiple PV canopy systems coupled with battery energy storage designed for peak shaving. Portfolio made up 3.97MW DC PV with 1.1MW/2.09MWH of storage. All projects went through District of State Architect's (DSA) review, following ADA compliance.

San Marcos Unified School District, San Marcos, CA Member of engineering team designing PV canopy systems for 13 different schools in the district. All projects went through District of State Architect's (DSA) review, following ADA compliance. Coordinated with Third party canopy vendor MBARC for construction of all canopy projects.

Notable O&M Experiences.

Walmart, PV Module swaps, Multiple locations. Worked on multiple Walmart projects where PV arrays were having faulty production outputs. Assessed measured system outputs with as built drawings and projected system performance outputs, along with O&M survey photos to identify faulty PV module strings and replace PV modules with newer more reliable PV modules.

Notable Battery Energy Storage Systems

Madd River Healthcare, Arcata, CA. (OSHPD Tier 1) Lead designer on a 280kVA/1,3922KWh battery Energy storage site designed for Peak load shaving at a Tier 1 hospital with high seismic activity. (Prior to AECOM)

JLL Adventist Health, Tehachapi, CA. (OSHPD Tier 1) Lead Designer on a 1,001kVA/3,805.2kWh Battery energy storage system designed to support emergency loads of the hospital in the event of an outage. The Battery system was integrated into the existing emergency diesel generation system so that the battery would not take over the load first before switching over to Diesel. (Prior to AECOM)

JLL Adventist Health - Family Medicine, Sycamore, CA. (OSHPD Tier 3) Lead Designer on a 572kVA/2,899kWh Batter energy storage system designed to support emergency loads of the hospital in the event of an outage. The Battery system intercepted the utility transformer secondary circuits before directly feeding the building through the Battery switchboard (which became the primary building switchboard). (Prior to AECOM).

Fallbrook Public Utility District, Fallbrook, CA. Lead designer for 3 Battery Energy Storage systems connected to critical water infrastructure. Responsibilities involved designing the system, working within existing site constraints, avoiding utilities, and SCADA controls. System totals came to 1.2MW/3.23MWh.

Notable Electric Vehicle Charging

Buc-ee's - New Braunfels, Texas. This site is the largest Gas Station in the world. Designed the permit and construction drawing package for the largest Tesla super charging station in Texas consisting of 24 Tesla Supercharging stalls. (Prior to AECOM)

Buc-ee's – Multiple Sites -Texas. Lead Designer for multiple 8 and 12 stall Tesla Supercharging sites across the state. Responsible for design construction set, conforming to all ADA standards, and coordinating with all utility AHJ requirements.

AECOM

Miguel Contreras

Solar Designer

Education
BS, Mechanical Engineering,
UANL Monterrey MX, 2005

Years of Experience
With AECOM: <1
With Other Firms: 16

Areas of Expertise
PV Design Drafting and Document Creation with AutoCAD and Revit

PV Modeling Using Helioscope, PVSyst, and SAM

NEC Knowledge

Mr. Contreras is an experienced solar designer with more than 16 years of experience in the energy field working on residential, commercial, and industrial PV systems. He brings a strong background in low voltage grid systems.

Miguel also has experience in fire sprinkler design and PV construction management.

Selected Project Experience

Siemens, Various Locations. Solar designer. Executed the conceptual design for ground-mounted carport and roof-mounted PV systems across five distinct locations, culminating in a total system capacity of 40 MWdc for all sites combined. [2023]

Wells Fargo, Falcon Buildings, Irving, TX. Served as owner's engineer. Reviewed a unique rooftop PV system featuring multiple points of connection. This system was situated on a custom-built parking structure atop the buildings-distinguished from a standard carport-and had a total capacity of 6 MWdc. [2023]

Tennessee Valley Authority, Shawnee Fossil Plant, McCracken County, KY. Member of electrical engineering team who produced detailed design for 114MW+400MWh PV+BESS. ground-mount on a repurposed fossil plant. [2023]

1st Light Energy, CA. Served as lead project designer responsible for PV design of C&I scale PV systems. Created electrical single line diagrams, layouts, specifications, and supported calculations for construction plans for AHJs and installation crews. Represented the company as technical lead for meetings with vendors, utilities, and public officials. [Prior to AECOM]

Extra Space Storage, Various Locations. Lead engineer supervising a team of designers and project managers for PV systems ranging from 50kWto 250kW installed across the country in 800+ sites. Directed designs produced by the team. Created team of site auditors and developed a site audit process for site information collection. Developed a project benchmark structure to track project progress in all stages from conceptual design to commissioning. [Prior to AECOM]

Cube Smart, Various Locations. Lead engineer supervising a team of design engineers and project managers for PV systems ranging from 50kWto 250kW installed across the country in 400+ sites. Directed and reviewed designs produced by the team. [Prior to AECOM]

Public Storage, Various Locations. Lead engineer supervising a team of design engineers and project managers for PV systems ranging from 50kWto 250kW installed across the country 500+ sites. Directed and reviewed designs produced by the team. [Prior to AECOM]

Capos Field, Caruthers, CA. Lead design engineer for a 3MW single axis PV system at existing facilities. Responsible for drawing preparation for AHJ submittal and construction drawings. [Prior to AECOM]

Takeda, Thousand Oaks, CA. Lead design engineer responsible for detailed design of a 1.1 MW single axis, carports and roof mounted PV system and 646kW/2585kWh BESS system. [Prior to AECOM]

KP, San Bernardino, CA. Lead design engineer responsible for design of a 690kW carport PV system and 87kW/195kWh BESS system. [Prior to AECOM]

AECOM

Lovneesh Nigam

Solar Engineer

Education
MS, Energy Systems, Northeastern University, Boston, MA, 2021

BEng, Electrical and Electronics Engineering, Birla Institute of Technology and Sciences, United Arab Emirates (UAE), 2019

Years of Experience
With AECOM: <1
With Other Firms: 2

Licenses/Registrations
Schneider Electric Professional Development Program

Solairgen Photovoltaic (PV) Design and Installation (Current)

Areas of Expertise
Solar PV and Electrical Design and Energy Analysis, Renewable Energy Systems, Financial Analysis, Battery Energy Storage Design, Power System Analysis, Power Apparatus and Networks, Electric Power Utilization and Illumination Helioscope, PVsyst, AutoCAD, PVWatts, Data Collection and Analysis

Mr. Nigam is a dedicated solar engineer with 1.5 years of experience in energy design/development and project management. Throughout his professional and academic career, he has worked in a customer-focused environment, tailoring energy solutions to meet client requirements. His interests and expertise lie in working on energy research and analysis, solar design, and energy efficiency.

As a solar project engineer, Lovneesh provides technical skills to help implement large-scale energy related projects. His experience allows him to aid in the full development and life cycle of electrical or energy-related projects pertaining to solar energy, battery energy storage, HVAC (ASHP/VRF Systems), energy production and economic modeling, and system integration. He has provided technical design support to teams in the field of heating electrification, electrical engineering, and project management. He also brings along with him a comprehensive corporate experience gained in the United States and in the Gulf, providing design support to corporate partners.

Selected Project Experience

JFK Airport Terminal 6 Rooftop Solar PV Project, New York, NY. Lead Solar/Electrical Design Engineer. Designed a rooftop solar PV at JFK Airport, totaling to a 2.25 MWac system. Responsibilities included development of the solar layout, DC electrical design, performance modelling and coordination with the AC electrical design, civil, and structural design teams. AutoCAD, Helioscope, PVSyst, and Forge Solar were the tools used to accomplish a detailed design and energy analysis. [2022] [AECOM]

Stolthaven Sustainability and Renewables study, Houston, New Orleans. Solar Design Engineer. Designed a preliminary design layout on Helioscope to determine potential solar and production through a carport design (2), rooftop PV (4), ground mount (7) at the Stolthaven Houston (7.12 MWac/1.06 MWac), New Orleans (4.98 MWac) sites. [2022] [AECOM]

Wells Fargo Solar Program Management Services, NJ, AZ & CA. Solar Design Engineer. Supported the project with technical design review, engineering design review, and site visits for post construction review of the deployed solar arrays at retail and administrative sites in multiple states. [2022] [AECOM]

25 MWac GUPTA 3 Solar Ground Mount Project, Texas. Solar/Electrical Design Engineer. Supported with the development of Tier 1 DC electrical drawings (Single line diagrams, Inverter and Transformer sizing, and Interconnection) for a single axis tracker ground mount arrays totaling to a 25 MWac consisting of ~50,000 modules [2022] [AECOM]

13.5 kW TWP Rooftop Solar PV, Renewable Opportunity, New York, NY. Lead Solar/Electrical Design Engineer. Designed a preliminary CAD layout with potential system size, shading analysis on the rooftop of Two Worldwide Plaza. [2022] [AECOM]

Toledo Solar PV Ground Mount Array, OH. Solar/Electrical Design Engineer. Designed a preliminary Helioscope design to evaluate the expansion capability at an existing ground mount facility. Designed a replicate design (with latest modules) and an optimized design rated at 4.24 MWdc and 3.75 MWdc respectively. [2022] [AECOM]

103 MWdc, 21 Sites-Luminace- Brookfield Renewables, Ground Mount Project Services, Oregon-Maine. Solar/Electrical Design Engineer. Assisted with comprehensive due diligence and project support services (IC Applications, Permits) for Ground mount arrays in Oregon (12 sites) and Maine (9 Sites). [2022] [AECOM]

Northeast Energy Efficiency Partnerships (NEEP), Lexington, Massachusetts. Heating Electrification Technical Intern. Investigated implementation of utility incentive programs, policies, and legislation, and HVAC technologies (Air source heat pump [ASHP] and variable refrigerant flow [VRF] systems) in 12 Northeast and Mid-Atlantic states promoting energy efficiency to develop a market tracker for strategic electrification. Managed NEEP's qualified product list of cold climate ASHPs by reviewing and calculating heating seasonal performance factor, seasonal energy efficiency ratio, energy efficiency ratio, and coefficient of performance. Facilitated sizing visualization tool development to recommend products based on ductwork design, heating, and cooling needs. [2021] [Prior to AECOM]

Emerson Automation Solutions, Dubai, UAE. Project Management Intern. Coordinated after-sales activities and monitored $1-2M oil and gas projects for measurement and analytical department. Assisted project manager with sales, customer meetings, and presentations to identify/finalize design/production requirements, performance requirements, scope of works, and scale of project. Led 8 product inspections, reviewed orders/designs, and improved budget allocation using scheduled product manufacturing and bill of materials based on project sequencing. [2019] [Prior to AECOM]

GOPA International Energy Consultants, Abu Dhabi, UAE. Electrical engineer intern. Supervised 11kV primary substation network, and coordinated quality reviews of design, load demands, and protection studies. Performed testing and procured and installed cross-linked polyethylene cables, low voltage control panels, and four 20MVA transformers. Supported development of bid and contract documents, including bid clarification, and technical and commercial bid evaluation. [2018] [Prior to AECOM]

AECOM

Stephanie S. Ruybal, MScEng, PE

Structural Engineer

Education
MS, Civil Engineering, University of Colorado at Denver

BS, Civil Engineering, University of Colorado at Boulder

Licenses
Professional engineer: Alaska, #AELC14795; Arizona, #72895; California, #93288; Colorado, #42214; Kansas, #28588; New Mexico, #26892; New York, #103278; Oklahoma, #31670; Utah, #11865737-2202; Wyoming, #PE 18481

Years of Experience
With AECOM: 13
With Other Firms: 5

Areas of Expertise
Structural Design and Analysis Calculations

Structural Codes and Specifications

Evaluation of Existing Structures

Steel Connection Design

Civil Engineering

Structural Engineering

Ms. Ruybal has more than 18 years of structural engineering experience including the design of steel and concrete structures with both shallow and deep foundations in high seismic and arctic conditions.

Stephanie's computer experience includes STAAD.Pro; RAM Connect; AutoCAD; Mathcad; Navisworks; TEDDS. Proficient with engineering codes including AISC, ASCE, IBC, and ACI.

Selected Project Experience

Kinder Morgan, Pipeline Relocation and Engineered Shoring Design, Arizona. Served as engineer of record for the relocation of existing underground gas lines and the engineered shoring design required to relocate the existing gas lines.

City of Burbank, Rooftop Photovoltaic Evaluation, Burbank, California. Served as lead structural engineer. Evaluated the feasibility of adding new photovoltaic panels to the roof of an existing structure. Authored a feasibility report supported by site visit observations and design calculations.

Confidential Client, EV Charging Station, California. Lead civil engineer. Led the civil engineering team to create electric vehicle charging station layouts, grading plans, and other construction documents to support permitting. Evaluated sustainable and green construction materials to help the client achieve sustainability goals.

Confidential Client, EV Charging Station, Utah. Lead civil engineer. Led the civil engineering team and worked closely with the project team and the client to develop the conceptual layout and design options that met the client's sustainability requests and code requirements.

Rio Tinto Kennecott, East Tailings Expansion, Utah. Lead structural engineer who oversaw the structural team responsible for the designs of substation foundations, pump/valve stations, and hydraulic structures for a mine expansion project.

Viasat, Radome Project, Snowball, Alaska. Served as the structural engineer of record. Provided technical advisement, created design calculations, and oversaw a team of structural engineers and designers for the designs of a Radome support concrete ringwall, concrete auxiliary buildings, antenna pedestal, steel platforms, steel canopies, and equipment foundations. Also provided construction and fabrication specifications for steel and concrete materials.

Viasat, Radome Project, Sahara, Qatar. Lead structural engineer. Provided technical advisement, created design calculations, and oversaw a team of structural engineers and designers for the designs of a Radome support concrete ringwall, concrete auxiliary buildings, antenna pedestal, steel platforms, steel canopies, and equipment foundations. Also provided construction and fabrication specifications for steel and concrete materials.

Holly Energy Partners, New Manifold, El Dorado, Kansas. Served as the structural engineer of record. Provided technical advisement and oversaw a team of structural engineers and designers for the designs of new steel supports, underground utility crossing concrete structures, and new foundations to support the new manifold at an existing facility.

Holly Energy Partners, UNEV SLC VFD Project, Utah. Served as the structural engineer of record. Created design calculations for the evaluation of a new pump on an existing foundation, which included dynamic analysis of the pump equipment. Also provided technical advisement for steel supports and a building foundation.

Holly Energy Partners, Conversion of Existing Tanks to Crude Oil Tanks, Contango, Wyoming. Served as the structural engineer of record. Provided technical advisement, created design calculations, and oversaw a team of structural engineers and designers for the designs of new steel supports on existing foundations and new equipment foundations for the retrofit of the existing tanks.

Rio Tinto Kennecott, Next Push Back, Utah. Served as the structural engineer of record who provided technical advisement, created design calculations, and oversaw a team of structural engineers and designers for the designs of pump stations, valve stations, process water management concrete hydraulic structures, and building foundations for a mine expansion on an existing site to increase the storage of additional tailings material.

Rio Tinto Kennecott, Single Point Discharge Pump Station, Utah. Lead structural engineer. Designed steel supports and foundations for piping and equipment for a new pump station, which was required to extend the operating life of an existing mining site.

Folgers, Warehouse Automation Phase 2, Louisiana. Structural engineer. Evaluated an existing masonry structure for the retrofit of existing equipment, including the analysis of existing masonry walls for new openings, masonry lintel design, and an evaluation of the existing foundation.

Black Hills Energy, Wolf Creek #9, Colorado. Served as the structural engineer of record. Created design calculations and oversaw a team of structural engineers and designers for structural steel and foundation designs, specifications, and grading plans. Design drawings and calculations included pre-engineered metal building foundations, equipment foundations, and miscellaneous foundations for a natural gas storage project expansion for new drilling wells and wellhead equipment.

Holly Energy Partners, Cushing Connect Pipeline, Oklahoma. Served as the civil/structural engineer of record, created design calculations, and oversaw a team of structural engineers and designers for structural steel, foundations, and grading plans. Design drawings and calculations included dynamic equipment foundation design, steel design for pipe stress reactions, and miscellaneous foundation design for a new pipeline project.

Sinclair, Sulphur Tank Replacement, Wyoming. As structural engineer created design calculations for a retrofit of existing foundations for new equipment including an evaluation of existing foundations and designs of modifications to existing foundations for a sulfur tank replacement project.

United States Department of Energy, Spent Fuel Handling Recapitalization Project, Idaho. Structural engineer. Designed stainless steel and concrete structures for a new spent fuel handling facility for naval nuclear-spent fuel. This new facility increases the efficiency and effectiveness of handling spent fuel while reducing long-term risks and costs.

United States Department of Energy, Low Activity Waste Pretreatment System, Washington. Structural engineer. Designed steel and concrete structures for equipment including lag storage tanks, process tanks, and reagent tanks required for the removal of radioactive cesium and solids from Hanford tank waste.

Dresser-Rand, Pacific Ethanol, California. Structural engineer. Designed steel structures and their connections in addition to dynamic equipment foundations on an existing site in a high seismic zone for a project that added new turbine generators at an existing facility.

Shell LNG Fueling, Travel Center of America #108, Nevada. Structural engineer. Designed buried tanks for buoyancy and designed steel canopy for a new liquefied natural gas fueling station. Also designed miscellaneous steel structures, their connections, and equipment foundations.

Sempra, Holbrook Compressor Station, Louisiana. Structural engineer. Designed steel structures and their connections for equipment and piping required as part of the modifications to the Cameron Interstate Pipeline's existing gas transmission system to receive and transport domestically produced natural gas to the Cameron LNG liquefaction project.

AECOM

Kristin Thibodeaux Bernard, PE

Civil Engineer

Education
MS, Civil Engineering, Georgia Institute of Technology, Atlanta, GA, 2003

BS, Civil Engineering, Louisiana State University, Baton Rouge, LA, 2002

Years of Experience
With AECOM: 15
With Other Firms: 4

Areas of Expertise
Structural Steel

Concrete Design

Foundations

Pipe & Equipment Supports

Stormwater Analysis for Permitting

Licenses
Professional engineer: Louisiana, #34362, 2009; Texas, #133808, 2019; Massachusetts, #58187, 2023

Mrs. Bernard has 19 years of experience in design of structural steel, concrete, foundations, and pipe/equipment supports for manufacturing and petrochemical facilities. Her experience also includes evaluating stormwater impacts of new construction for permitting. Her responsibilities include calculations, Staad structural modeling, drawing input and mark-ups, and shop drawing review.

Selected Project Experience

Vali Cooper International, Various Projects. Lead civil engineer/engineer of record for various multi-discipline projects for the Department of Energy. Responsibilities included development of detailed drawings and specifications, performing engineering calculations, and providing construction support through submittal review and responding to construction questions (RFIs). Major project experience

- BC-MM-793, Seal Flush Tanks and Seal Flush Pumps: Designed tank foundation and steel pipe supports for the replacement of seal flush tanks and pumps.
- BH-LE-1778, Raw Water Pigging Settling Pond: Detailed liner system and concrete paving for anhydrite pond, miscellaneous pipe supports, and requirements for precast sumps.
- BH-MM-782, Replace Slop Oil Tanks & Pumps: Designed concrete containment area and foundation for slop oil tanks, along with pump foundations and pipe supports.
- BM-LE-1760 Security Gate: Miscellaneous foundations and concrete details for security entrance project.
- BM-MM-1213 Boat Dock at Blue Lake: Designed timber boat dock and gravel truck access area.

Folgers, Various Projects, New Orleans, Louisiana. Engineer in civil/structural department for miscellaneous civil and structural projects. Major projects include:

- Analysis and modifications to existing building and open frame structures for dust collection equipment installation.
- Retrofit of existing warehouse with substantial settlement issues, bringing warehouse to meet code.
- Design of steel and foundation for a new industrial building and silo support structure.
- Repaving the surrounding area to widen the truck path, including a stormwater evaluation and permit and sheet pile design, were completed.
- Various other projects include stormwater evaluation and systems design; steel platforms and pipe supports; and load rating analysis of existing monorails.

Luminace, Various Locations. Acted as client's engineer to provide preliminary review of solar panel construction packages, including a review of preliminary drainage for permitting and structural details for foundations and panel supports.

Ljungstrom, By-Pass Duct, IO. Lead civil/structural engineer for installation of new by-pass duct at the Walter Scott plant. Responsibilities included design of by-pass duct framing and strengthening of existing duct.

Viasat, Various Locations. Project support structural engineer for new building structure and communications antenna pedestal. Responsibilities included checking calculations, shop drawing review, answering RFIs, and performing site visit for general compliance with structural drawings.

Kennecott, Various Locations. Project support structural engineer for new mining building structure and sump structures. Responsibilities included checking calculations, shop drawing review, answering RFIs, and Staad structural modeling.

Various Architectural Clients, Various Projects. Engineer in civil/structural department for the design of new and retrofit commercial buildings using steel, concrete, and/or timber and checked shop drawings.

International Industrial Client, Various Projects. Engineer in civil/structural department for the design of platforms, pipe supports, and equipment support for mining industry client.

Miscellaneous Petrochemical Clients. Engineer in civil/structural department who performed design and checked for steel structures and foundations such as platforms, pipe supports, vessel supports, and pumps.

Enterprise Products (EPROD), New Piperack Structure, Mont Belvieu, TX. Engineer in the civil/structural department who worked with structural engineering team to design new piperack structure spanning the facility, including a 270-foot piperack bridge.

ConocoPhillips, Hurricane Hardening, Belle Chasse, LA. Engineer in the civil/structural department for the design to widen drainage ditches between existing levee and railroad and upgrade of drainage ditch with new culverts. Designed new pump station with sump and structural steel for generators and MCC building.

ConocoPhillips, Engineering Services Alliance, Belle Chasse, LA. Engineer in the civil/structural department for the design of structural steel, pipe supports, foundations, and equipment supports.

Tennessee Valley Authority, Hammond Fossil Fuel Power Plant, Rogersville, TN. Engineer in the civil/structural department for the design of duct support for the design, construction and installation of smokestack scrubbers to limit sulfur dioxide emissions. Was also responsible for the design of access platforms on the absorber and a new ARS monorail.

Cytec Industries, Engineering Services Alliance, Westwego, LA. Engineer in the civil/structural department for the design of T-Support for the installation of a new pipeline project that was completed under a small projects engineering alliance.

Tennessee Valley Authority, John Sevier Fossil Fuel Power Plant, Rogersville, TN. Engineer in the civil/structural department for the design of duct support for the design, construction, and installation of smokestack scrubbers to limit sulfur dioxide emissions.

Motiva, Steel Structure, Norco, LA. Engineer in the civil/ structural department for the design of retrofit to strengthen steel for the addition of new piping to an existing steel structure.

Motiva, Foundation Design, Norco, LA. Engineer in the civil/structural department for the design of foundations, containment wall, and spread footing for the addition a new tank.

Motiva, Foundation Design, Norco, LA. Engineer in the civil/ structural department for the design of pile-supported foundation for a horizontal vessel.

Motiva, Deck Addition, Norco, LA. Engineer in the civil/ structural department for the design of a deck addition to a new concrete coker structure.

Motiva, Steel Structure, Norco, LA. Engineer in the civil/ structural department for the design of a new structural steel for vertical vessel on top of an existing foundation.

Lafarge North America, Cement Division, Atlanta, GA. Technical sales representative responsible for troubleshooting and resolving customer issues regarding cement/concrete including low strength, excessive cracking, and discolorations. Assisted customers with concrete mix design optimization. Worked on cement plant quality assurance teams in producing quality and consistent product.

Georgia Institute of Technology, Atlanta, GA. As research assistant/teaching assistant, performed research on the potential of alkali-silica reaction of hollow glass spheres in oil well cement slurries. Presented pre-class lectures and monitored lab experiments for material science lab class. Tutored and assisted undergraduate students with course material and lab reports.

AECOM

Cynthia Kinkade
Environmentalist, Senior Project Manager

Education
Master of Science (MSc), Environmental Management, Duke University, 1999
Master of Public Policy (MPP), Public Policy Analysis, Duke University, 1999
Bachelor of Science (BSc), Ecology, University of California - San Diego, 1995

Years of Experience
With AECOM: 20
With Other Firms: 10

Registrations/Certification
OSHA 10-Hour Construction Safety Training, 12/31/2001
Erosion and Sediment Control Training, Engineering and General Contractors Association, 12/31/2001
Stormwater Pollution Prevention Plan Sampling and Monitoring Strategy, Building Industry Association, 12/31/2004
Construction Management Academy, Cityof San Diego, 12/31/2005
Project Management Training, PSMJ, 12/31/2008

Ms. Kinkade is a well-accomplished senior project manager with over two decades of experience in the private and public sectors, including a broad range of knowledge of environmental compliance requirements for projects, from planning and design review through construction and post-construction monitoring. She has a proven record for managing large projects within task-order-based contracts, particularly complex coastal projects in the San Diego region.

Cindy has coordinated environmental compliance for projects in various capacities and has expertise in project design review; California Environmental Quality Act/National Environmental Policy Act document review and preparation; public involvement; agency and permitting coordination; permit processing of city, state, and federal permits; construction and stormwater monitoring; and mitigation implementation and reporting requirements. She has also been responsible for environmental aspects of public outreach programs required as part of project or permit approvals. Cindy has a proactive project management approach that has successfully met the challenges of the unique aspects of projects through fostering a partnership with clients, other consultant team members, and agency staff. Her project stakeholders have included extremely engaged public and agency members, community organizations, and other public agencies, many of whom have competing missions and concerns.

Selected Project Experience

City of Carlsbad, Carlsbad Boulevard Realignment and Land Exchange, Carlsbad, California.
Project manager for the on-call contract in which the city proposed a realignment of a portion of Carlsbad Boulevard between Cannon Road and Batiquitos Lagoon, as well as a land exchange with California State Parks to provide additional space for the South Carlsbad State Beach Campground. Coordinated preparation of an opportunities and constraints report and conceptual alternatives development. The project is being designed to highlight opportunities the city has to create a destination emphasizing coastal access and recreation while accounting for constraints along the corridor, including the presence of occupied vernal pools and lands purchased with Land and Water Conservation Funds (LWCF) and now subject to Section 6(f) of the LWCF Act.

California Department of Transportation - District 11, San Dieguito Lagoon Restoration Plan (W19) Environmental Impact Report/Environmental Assessment, San Diego, California.
Managing the development of a wetland restoration project within the W-19 portion of San Dieguito Lagoon, adjacent to previous restoration efforts by Southern California Edison. The project is proposed by SANDAG and Caltrans to serve as mitigation for various infrastructure projects that will be implemented within the north coast corridor of San Diego. AECOM is involved in the project design team (PDT) and agency engagement process and is initiating technical studies and an EIR/EA. Issues include not only restoration of wetland habitats within an existing lagoon system, but compatibility with adjacent recent restoration projects, recreational use goals, and materials disposal concerns. This represents another complex project being planned for the northern San Diego coastal region and will require coordination with the full range of resource and regulatory agencies, as well as a range of specific stakeholders, to ensure project success.

San Diego Association of Governments, E&E Services 2013-2018 - Buena Vista Lagoon Preliminary Engineering, Carlsbad, California.
Senior project manager on the Buena Vista Lagoon Enhancement Project, a project being proposed by SANDAG and located between the cities of Oceanside and Carlsbad, CA. The lagoon is unique within the region as the only freshwater coastal lagoon within the north coast corridor, with a highly vocal group of engaged stakeholders. Additional complexities include private property ownership within the lagoon, competing recreational and habitat enhancement interests, and vector control concerns. Issues and concerns on the project include not only lagoon dynamics and processes, but also marine and coastal issues due to proposed sand placement on nearby beaches. The team is currently preparing a draft environmental impact report that evaluates a range of alternatives, as well as a series of technical reports.

San Elijo Lagoon Conservancy, San Elijo Lagoon Restoration - Environmental Impact Report/EIS, Encinitas, California.
Project manager for the San Elijo Lagoon Restoration Project, which is being developed in a stakeholder-driven process. This project process includes consistent meetings with the agency stakeholder group, which have been led through development of preliminary alternatives, a defined purpose and need, and completed public scoping process with extensive public coordination and involvement. The draft environmental impact report/environmental impact statement was distributed for public review in fall 2014. A final EIR/EIS is currently being prepared by the team, and permitting efforts initiated. This complex project has been identified as a critical component of Caltrans' mitigation program for the I-5 North Coast Corridor project, as identified in the public works plan. Development of the restoration plan involves a highly engaged stakeholder group including the Coastal Conservancy and a range of regulatory and natural resource agencies, including US Fish and Wildlife Service, California Department of Fish and Game, National Marine Fisheries Service, US Army Corps of Engineers, and the Coastal Commission. A vocal public interest has developed in the project requiring an extensive public scoping and public review process.

San Diego Association of Governments, Lagoon Overview Study, San Diego, California.
Project manager for evaluating each of the six lagoons within the north coast corridor area for mitigation/restoration potential. The study was used to identify both creation and enhancement mitigation opportunities and focus agency mitigation efforts along the corridor. The results of this study led to current restoration and enhancement efforts within various lagoons, as discussed above.

San Diego Association of Governments, SR 76 - Melrose to Mission, San Diego, California.
Project manager/team leader responsible for various task orders in support of environmental review for the proposed State Route 76 alignment in northern San Diego County. The project included improvements along five miles of the existing SR 76 roadway along the San Luis Rey River. Tasks included preliminary environmental project review, technical study coordination and review, and draft and final EIR/EIS preparation

San Diego Association of Governments, I-5/SR 56 Interchange, San Diego, California.
Environmental project manager/team leader responsible for various task orders supporting environmental review of the proposed I-5/SR 56 interchange. The proposed project would provide improvements to the existing interchange between I-5 and SR 56 and would include alternatives ranging from construction of direct connectors to surface street improvements. Tasks included technical study preparation and review, as well as draft and final EIR/EIS preparation.

San Diego Association of Governments, I-5 North Coast Corridor, San Diego, California.
Environmental project manager/team leader responsible for coordinating preparation of portions of the EIR/EIS and technical study preparation and review. Tasks also included an extensive community impact assessment effort, preparation of air quality and 4(f) analyses, and preparation of a draft relocation impact study. The project would implement improvements along approximately 26 miles of the existing I-5 corridor, extending from the city of San Diego north to the city of Oceanside.

City of San Diego, Sorrento Valley Road Environmental Impact Report, San Diego, California.
Analyst for preparation of EIR that evaluated alternatives for improvements of the portion of Sorrento Valley Road temporarily closed during construction of SR 56. Coordinated between city and local community and environmental groups during project design and approval.

City of San Diego, Carmel Valley Road Enhancement Environmental Impact Report, San Diego, California.
Analyst for preparation of EIR that compared proposed enhancement alternatives to portions of Carmel Valley Road to provide additional parking, traffic operations, and pedestrian safety while protecting the adjacent lagoon.

City of San Diego, SR 56 Environmental Impact Report, San Diego County, California.
Analyst for preparation of EIR that evaluated construction of a 5-mile segment of a 6-lane freeway between SR 56 West (I-5) and SR 56 East (I-15). Evaluated two alignments and two roadway widths in the draft EIR issued in December 1996.

ATTACHMENT B
NEGOTIATED FEE PROPOSAL

Work Order Estimate Summary

MTS Doc. No.	**PWL356.0-22**
Work Order No.	**WOA356-AE-55**
Attachment:	**B**

Work Order Title: **Admin Facility Roof Solar Assessment**

Project No:

Table 1 - Cost Codes Summary (Costs & Hours)

Item	Cost Codes	Cost Codes Description	Total Costs
1		Project Management and Coordination	$32,800.43
2		Solar and Energy Analysis	$50,130.48
3		Electrical and Structural Analysis	$70,944.14
4		Economic Feasibility and Financing Analysis	$22,929.07
5		Preliminary and Final Report Documentation	$42,357.32
		Totals =	**$219,161.44**

Table 2 - TASKS/WBS Summary (Costs & Hours)

Item	TASKS/WBS	TASKS/WBS Description	Labor Hrs	Total Costs
1		Project Management and Coordination	143.0	$32,800.43
2		Solar and Energy Analysis	222.0	$50,130.48
3		Electrical and Structural Analysis	300.0	$70,944.14
4		Economic Feasibility and Financing Analysis	85.0	$22,929.07
5		Preliminary and Final Report Documentation	183.0	$42,357.32
		Totals =	**933.0**	**$219,161.44**

Table 3 - Consultant/Subconsultant Summary (Costs & Hours)

(If Applicable, Select One)				Consultant	Labor Hrs	Total Costs
DBE	DVBE	SBE	Other			
x		x		Pacific Railway Enterprises, Inc.	72.0	$13,515.12
				AECOM	861.0	$205,646.32
				Totals =	**933.0**	**$219,161.44**

Work Order Estimate Summary

Consultant/Subconsultant: **Pacific Railway Enterprises, Inc.**

Total Hours = **72**

Total Costs = **$13,515.12**

Work Order Title: **Admin Facility Roof Solar Assessment**

Item	TASKS/WBS	TASKS/WBS Description	ODCs (See Attachment)	Project Manager	Engineer - Principle	Engineer II	Engineer I	Technical Expert	Task Manager	Technician - Senior	Engineer - Senior	Technician - 3	Technician - 2	Technician - 1	CADD - 3	CADD - 2	Intern	Total Hours	Totals
				$ 215.31	$ 266.96	$ 98.40	$ 91.11	$ 232.14	$ 193.84	$ 159.89	$ 212.99	$ 126.13	$ 119.55	$ 107.17	$ 87.63	$ 74.28	$ 46.43		
1	**Task 1**	**Project Management and Coordination**																	
	1.1 Subconsultant Management - Scheduling, Progress Reports,			16														16	$3,444.96
	1.2 Project Coordination - Meetings			16			16											32	$4,902.72
	1.3 Oversight and Submittal Preparation			12														12	$2,583.72
	1.4 Submittal Document Review and Recorded QA/QC			12														12	$2,583.72
		Subtotals (Hours) =	N/A	56			16											72	$13,515.12
		Subtotals (Costs) =		$12,057.36			$1,457.76											**72**	**$13,515.12**
2	**Task 2**	**Solar and Energy Analysis**																	
	2.1 Total Energy Generation Analysis																		
	2.2 Electrical Cost Savings Analysis																		
	2.3 Modern Technology Review and Analysis																		
	2.4 Review and Recommend Equipment Installation Capacities																		
	2.5 Location Based Storage System Integration Review																		
	2.6 Facility Based Electricity Consumption Analysis and System																		
	2.7 CEQA Concerns and Site Specific Challenges and																		
		Subtotals (Hours) =	N/A																
		Subtotals (Costs) =																	
3	**Task 3**	**Electrical and Structural Analysis**																	
	3.1 Facility Solar Feasibility Analysis																		
	3.2 Carport Solar Feasibility Analysis																		
	3.3 Solar Building Implementation Feasibility and Reccomendations																		
	3.4 Location based Consumption vs Output Analysis																		
	3.5 Facility Time of Use Load Data																		
	3.6 Interconnection Recommendations		N/A																
		Subtotals (Hours) =	N/A																
		Subtotals (Costs) =																	
4	**Task 4**	**Economic Feasibility and Financing Analysis**																	
	4.1 Facility Economic Feasibility and Financing Analysis																		
	4.2 Estimates of Required Upgrades for Solar Implementation																		
	4.3 Finance Recommendations																		
		Subtotals (Hours) =	N/A																
		Subtotals (Costs) =																	
5	**Task 5**	**Preliminary and Final Report Documentation**																	
	5.1 Prelimiary Report - 50%																		
	5.2 Provide Conclusion of Study and Recommendation																		
		Subtotals (Hours) =	N/A																
		Subtotals (Costs) =																	
	Totals (Summary) =													**Totals =**			Totals =	**72**	**$13,515.12**
	Total (Hours) =			56			16											72	
	Total (Costs) =			$12,057.36			$1,457.76												$13,515.12
	Percentage of Total (Hours) =			78%			22%											100%	
	Percentage of Total (Costs) =			89%			11%												100%

Work Order Estimate Summary

Consultant/ Subconsultant: **Pacific Railway Enterprises, Inc.**

Work Order Title: **Admin Facility Roof Solar Assessment**

TASKS/WBS (1-5)

ODC Item	Description	Unit	Unit Cost	Task 1		Task 2		Task 3		Task 4		Task 5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
			Subtotal =			Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS/WBS (6-10)

ODC Item	Description											Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	

Work Order Estimate Summary

Total Hours = **861**

Total Costs = **$205,646.32**

Consultant/Subconsultant: **AECOM Technical Services, Inc.**

Work Order Title: **Admin Facility Roof Solar Assessment**

Item	TASKS/WBS	TASKS/WBS Description	ODCs (See Attachment)	Task Manager $ 307.01	Engineer - Senior $ 256.78	Engineer - Principal $ 318.82	Task Manager $ 307.01	Engineer - 2 $ 167.62	Engineer - 3 $ 210.31	Engineer - 2 $ 167.62	Engineer - Senior $ 256.78	Engineer - 3 $ 210.31	Environmentalist - Senior $ 250.03	Architect - 2 $ 160.62	Architect - Senior $ 243.44	Contract Manager $ 334.50	Designer - 3 $ 262.01	Total Hours	Totals
1	**Task 1**	**Project Management and Coordination**																	
	1.1	Subconsultant Management - Scheduling, Progress Reports,		8														8	$2,456.08
	1.2	Project Coordination - Meetings		8	3	3		3	3	3	3	3	3					32	$7,970.89
	1.3	Oversight and Submittal Preparation		4	1													5	$1,484.82
	1.4	Submittal Document Review and Recorded QA/QC		4	2	8					12							26	$7,373.52
		Subtotals (Hours) =	N/A	24	6	11		3	3	3	15	3	3					71	$19,285.31
		Subtotals (Costs) =		$7,368.24	$1,540.68	$3,507.02		$502.86	$630.93	$502.86	$3,851.70	$630.93	$750.09					**71**	**$19,285.31**
2	**Task 2**	**Solar and Energy Analysis**																	
	2.1	Total Energy Generation Analysis					10	6	6	6								28	$6,343.40
	2.2	Electrical Cost Savings Analysis					10	6	6	6								28	$6,343.40
	2.3	Modern Technology Review and Analysis					10	6	6	6								28	$6,343.40
	2.4	Review and Recommend Equipment Installation Capacities					10	6	6	6								28	$6,343.40
	2.5	Location Based Storage System Integration Review					2	6	6	6								20	$3,887.32
	2.6	Facility Based Electricity Consumption Analysis and System					10	6	6	6								28	$6,343.40
	2.7	CEQA Concerns and Site Specific Challenges and				2	2	6	6	6			40					62	$14,526.16
		Subtotals (Hours) =	N/A			2	54	42	42	42			40					222	$50,130.48
		Subtotals (Costs) =				$637.64	$16,578.54	$7,040.04	$8,833.02	$7,040.04			$10,001.20					**222**	**$50,130.48**
3	**Task 3**	**Electrical and Structural Analysis**																	
	3.1	Facility Solar Feasibility Analysis			12		8	8	8	8	16	20						80	$18,216.52
	3.2	Carport Solar Feasibility Analysis			12		10	8	8	8	8	16						70	$15,935.06
	3.3	Solar Building Implementation Feasibility and Reccomendations	$4,280.00				8	8	8	8		16						48	$14,465.44
	3.4	Location based Consumption vs Output Analysis					8	8	8	8								32	$6,820.48
	3.5	Facility Time of Use Load Data					10	8	8	8								34	$7,434.50
	3.6	Interconnection Recommendations				2	10	8	8	8								36	$8,072.14
		Subtotals (Hours) =	N/A		24	2	54	48	48	48	24	52						300	$70,944.14
		Subtotals (Costs) =	$4,280.00		$6,162.72	$637.64	$16,578.54	$8,045.76	$10,094.88	$8,045.76	$6,162.72	$10,936.12						**300**	**$70,944.14**
4	**Task 4**	**Economic Feasibility and Financing Analysis**																	
	4.1	Facility Economic Feasibility and Financing Analysis				4	18	6		6			4					38	$9,813.02
	4.2	Estimates of Required Upgrades for Solar Implementation				4	14		7				8					33	$9,045.83
	4.3	Finance Recommendations					10						4					14	$4,070.22
		Subtotals (Hours) =	N/A			8	42	6	7	6			16					85	$22,929.07
		Subtotals (Costs) =				$2,550.56	$12,894.42	$1,005.72	$1,472.17	$1,005.72			$4,000.48					**85**	**$22,929.07**
5	**Task 5**	**Preliminary and Final Report Documentation**																	
	5.1	Prelimiary Report - 50%			8	2	22	16	16	16	8		15					103	$23,979.59
	5.2	Provide Conclusion of Study and Recommendation			2	2	16	14	13	13	8		12					80	$18,377.73
		Subtotals (Hours) =	N/A		10	4	38	30	29	29	16		27					183	$42,357.32
		Subtotals (Costs) =			$2,567.80	$1,275.28	$11,666.38	$5,028.60	$6,098.99	$4,860.98	$4,108.48		$6,750.81					**183**	**$42,357.32**
	Totals (Summary) =										**Totals =**						Totals =	**861**	**$205,646.32**
	Total (Hours) =			24	40	27	188	129	129	128	55	55	86					861	
	Total (Costs) =		$4,280.00	$7,368.24	$10,271.20	$8,608.14	$57,717.88	$21,622.98	$27,129.99	$21,455.36	$14,122.90	$11,567.05	$21,502.58						$205,646.32
	Percentage of Total (Hours) =			3%	5%	3%	22%	15%	15%	15%	6%	6%	10%					100%	
	Percentage of Total (Costs) =		2%	4%	5%	4%	28%	11%	13%	10%	7%	6%	10%						100%

Work Order Estimate Summary

Consultant/ Subconsultant: **AECOM Technical Services, Inc.**

Work Order Title: **Admin Facility Roof Solar Assessment**

TASKS/WBS (1-5)

ODC Item	Description	Unit	Unit Cost	Task 1		Task 2		Task 3		Task 4		Task 5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Air Fare	Ticket	$300.00					6	$1,800.00				
2	Rental Car	Day	$100.00					2	$200.00				
3	Gas	Gallons	$6.00					30	$180.00				
4	Hotel	Day	$250.00					6	$1,500.00				
5	Subsistance	Day	$100.00					6	$600.00				
6													
7													
8													
9													
10													
				Subtotal =		Subtotal =		Subtotal =	**$4,280.00**	Subtotal =		Subtotal =	

TASKS/WBS (6-10)

ODC Item	Description	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Totals Quantity	Totals Total
1	Air Fare											**6**	**$1,800.00**
2	Rental Car											**2**	**$200.00**
3	Gas											**30**	**$180.00**
4	Hotel											**6**	**$1,500.00**
5	Subsistance											**6**	**$600.00**
6													
7													
8													
9													
10													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	**$4,280.00**

Metropolitan Transit System

Agenda Item No. 12

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Operations Budget Status Report for April 2025 (Gordon Meyer)

INFORMATIONAL ONLY

Budget Impact

None.

DISCUSSION:

This report summarizes the year-to-date operating results for April 2025 compared to the Fiscal Year (FY) 2025 amended budget for the San Diego Metropolitan Transit System (MTS). Attachment A-1 combines the operations', administrations' and other activities' results for April 2025. Attachment A-2 details the April 2025 combined operations' results and Attachments A-3 to A-7 present budget comparisons for each MTS operation. Attachment A-8 details budget comparisons for MTS Administration, and Attachment A-9 provides April 2025 results for MTS's other activities (For Hire Vehicle Administration (FHV)/San Diego and Arizona Eastern Railway Company (SD&AE)).

MTS NET-OPERATING SUBSIDY RESULTS

As indicated within Attachment A-1, for the year-to-date period ending April 2025, MTS's net-operating income favorable variance totaled $2,202,000 (0.8%). Operations produced a $661,000 (0.2%) favorable variance and the administrative/other activities areas were favorable by $1,541,000.

MTS COMBINED RESULTS

Operating Revenues. Year-to-date combined revenues through April 2025 were $92,189,000 compared to the year-to-date budget of $92,678,000, representing a $489,000 (-0.5%) unfavorable variance. Year-to-date passenger revenue was unfavorable to budget by $1,096,000 (-1.7%) through April, primarily due to average fare. With a forecasted average fare of $1.04 from February through June, the estimated average fare between February and April was $0.99. While average fare is -4.7% unfavorable variance to forecast, the average fare between February and April was still $0.05 (5.6%) higher than last year's average fare.

Other operating revenue was favorable by $607,000 (2.2%), primarily due to favorable interest income and rental income.

Operating Expenses. Year-to-date combined expenses through April 2025 were $362,135,000 compared to the budget of $364,826,000, resulting in a $2,691,000 (0.7%) favorable variance.

Personnel Costs. Year-to-date personnel-related costs totaled $161,212,000, compared to a budgetary figure of $162,430,000, producing a favorable variance of $1,218,000 (0.7%). This is primarily due to favorable paid absences, health and welfare costs within Bus Operations, favorable Security wages within Administration, and favorable Operator and Maintenance overtime wages within Rail Operations.

Outside Services and Purchased Transportation. Outside services in total through April 2025 were $131,327,000, compared to a budget of $131,733,000, resulting in a favorable variance of $406,000 (0.3%). This is primarily due to favorable contract security services and IT general outside services within Administration.

Materials and Supplies. Total year-to-date materials and supplies expenses were $15,319,000, compared to a budgetary figure of $15,346,000, resulting in a favorable variance of $27,000 (0.2%). This is primarily due to favorable revenue vehicle parts and maintenance supplies and equipment maintenance supplies within Rail Operations.

Energy. Total year-to-date costs were $38,353,000, compared to the budget of $39,411,000, resulting in a favorable variance of $1,058,000 (2.7%). This is primarily due to favorable commodity rates for both Compressed Natural Gas (CNG) and electricity.

Risk Management. Total year-to-date expenses for risk management were $8,442,000 compared to the budget of $8,370,000, resulting in an unfavorable variance totaling $72,000 (-0.9%). This is primarily due to unfavorable claims payouts within Bus Operations, partially offset by favorable claim recoveries and legal costs within Rail Operations.

General and Administrative. The year-to-date general and administrative costs were $5,664,000 through April 2025, compared to a budget of $5,725,000, resulting in a favorable variance of $61,000 (1.1%).

Vehicle and Facility Leases. The year-to-date vehicle and facilities lease costs were $1,818,000 compared to the budget of $1,811,000, resulting in an unfavorable variance of $7,000 (-0.4%).

YEAR-TO-DATE SUMMARY

The April 2025, year-to-date net-operating income totaled a favorable variance of $2,202,000 (0.7%). These factors include favorable variances in other operating revenue, personnel costs, outside services, materials and supplies, energy, and general and administrative, partially offset by unfavorable passenger revenue, risk management, and vehicle/facility leases.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. Comparison to Budget

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

MTS
CONSOLIDATED

COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ 64,021	$ 65,117	$ (1,096)	-1.7%
Other Revenue	28,167	27,560	607	2.2%
Total Operating Revenue	**$ 92,189**	**$ 92,678**	**$ (489)**	**-0.5%**
Personnel costs	$ 161,212	$ 162,430	$ 1,218	0.7%
Outside services	131,327	131,733	406	0.3%
Materials and supplies	15,319	15,346	27	0.2%
Energy	38,353	39,411	1,058	2.7%
Risk management	8,442	8,370	(72)	-0.9%
General & administrative	5,664	5,725	61	1.1%
Vehicle/facility leases	1,818	1,811	(7)	-0.4%
Administrative Allocation	(0)	(0)	0	0.0%
Total Operating Expenses	**$ 362,135**	**$ 364,826**	**$ 2,691**	**0.7%**
Operating Income (Loss)	**$ (269,946)**	**$ (272,148)**	**$ 2,202**	**0.8%**
Total Non-Operating Activities	**313**	**496**	**(182)**	**-36.8%**
Income (Loss) before Capital Contributions	**$ (269,633)**	**$ (271,652)**	**$ 2,020**	**-0.7%**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

OPERATIONS
CONSOLIDATED

COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ 64,021	$ 65,117	$ (1,096)	-1.7%
Other Revenue	1,088	1,032	55	5.4%
Total Operating Revenue	**$ 65,109**	**$ 66,150**	**$ (1,041)**	**-1.6%**
Personnel costs	$ 132,530	$ 133,319	$ 789	0.6%
Outside services	107,719	107,581	(138)	-0.1%
Materials and supplies	15,262	15,315	53	0.3%
Energy	37,248	38,311	1,064	2.8%
Risk management	7,629	7,526	(103)	-1.4%
General & administrative	933	978	45	4.6%
Vehicle/facility leases	1,437	1,430	(7)	-0.5%
Administrative Allocation	29,240	29,240	(0)	0.0%
Total Operating Expenses	**$ 331,999**	**$ 333,701**	**$ 1,702**	**0.5%**
Operating Income (Loss)	**$ (266,890)**	**$ (267,551)**	**$ 661**	**0.2%**
Total Non-Operating Activities	**313**	**265**	**49**	**18.3%**
Income (Loss) before Capital Contributions	**$ (266,577)**	**$ (267,287)**	**$ 710**	**-0.3%**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

OPERATIONS
BUS - DIRECTLY OPERATED (SAN DIEGO TRANSIT CORP.)
COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ 17,079	$ 16,906	$ 173	1.0%
Other Revenue	30	35	(5)	-14.4%
Total Operating Revenue	**$ 17,109**	**$ 16,941**	**$ 168**	**1.0%**
Personnel costs	$ 81,581	$ 82,095	$ 513	0.6%
Outside services	1,893	1,949	56	2.9%
Materials and supplies	6,457	6,444	(13)	-0.2%
Energy	6,322	6,613	291	4.4%
Risk management	3,339	2,947	(392)	-13.3%
General & administrative	454	464	10	2.2%
Vehicle/facility leases	490	473	(17)	-3.5%
Administrative Allocation	3,657	3,657	(0)	0.0%
Total Operating Expenses	**$ 104,193**	**$ 104,643**	**$ 450**	**0.4%**
Operating Income (Loss)	**$ (87,084)**	**$ (87,702)**	**$ 618**	**0.7%**
Total Non-Operating Activities	**-**	**-**	**-**	**-**
Income (Loss) before Capital Contributions	**$ (87,084)**	**$ (87,702)**	**$ 618**	**-0.7%**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

OPERATIONS
RAIL (SAN DIEGO TROLLEY INC.)
COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ 25,858	$ 27,149	$ (1,291)	-4.8%
Other Revenue	1,058	997	60	6.1%
Total Operating Revenue	**$ 26,916**	**$ 28,147**	**$ (1,231)**	**-4.4%**
Personnel costs	$ 50,186	$ 50,456	$ 270	0.5%
Outside services	10,223	10,272	49	0.5%
Materials and supplies	8,681	8,755	75	0.9%
Energy	22,961	23,728	768	3.2%
Risk management	4,275	4,564	289	6.3%
General & administrative	473	500	27	5.4%
Vehicle/facility leases	634	616	(18)	-3.0%
Administrative Allocation	23,093	23,093	(0)	0.0%
Total Operating Expenses	**$ 120,526**	**$ 121,985**	**$ 1,459**	**1.2%**
Operating Income (Loss)	**$ (93,610)**	**$ (93,838)**	**$ 229**	**0.2%**
Total Non-Operating Activities	**46**	**-**	**46**	**-**
Income (Loss) before Capital Contributions	**$ (93,563)**	**$ (93,838)**	**$ 275**	**-0.3%**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

OPERATIONS
BUS - CONTRACTED SERVICES (FIXED ROUTE)
COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ 19,804	$ 19,771	$ 34	0.2%
Other Revenue	-	-	-	-
Total Operating Revenue	**$ 19,804**	**$ 19,771**	**$ 34**	**0.2%**
Personnel costs	$ 591	$ 591	$ 1	0.1%
Outside services	79,494	79,227	(267)	-0.3%
Materials and supplies	125	116	(9)	-7.9%
Energy	6,897	6,957	60	0.9%
Risk management	-	-	-	-
General & administrative	5	7	2	33.7%
Vehicle/facility leases	27	55	28	50.5%
Administrative Allocation	2,063	2,063	(0)	0.0%
Total Operating Expenses	**$ 89,201**	**$ 89,016**	**$ (186)**	**-0.2%**
Operating Income (Loss)	**$ (69,397)**	**$ (69,245)**	**$ (152)**	**-0.2%**
Total Non-Operating Activities	**-**	**-**	**-**	**-**
Income (Loss) before Capital Contributions	**$ (69,397)**	**$ (69,245)**	**$ (152)**	**0.2%**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

OPERATIONS
BUS - CONTRACTED SERVICES (PARATRANSIT)
COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ 1,279	$ 1,292	$ (12)	-0.9%
Other Revenue	-	-	-	-
Total Operating Revenue	**$ 1,279**	**$ 1,292**	**$ (12)**	**-0.9%**
Personnel costs	$ 172	$ 177	$ 5	2.6%
Outside services	15,842	15,868	26	0.2%
Materials and supplies	-	-	-	-
Energy	1,068	1,013	(55)	-5.5%
Risk management	15	15	-	0.0%
General & administrative	2	7	5	72.1%
Vehicle/facility leases	285	286	0	0.1%
Administrative Allocation	428	428	0	0.0%
Total Operating Expenses	**$ 17,812**	**$ 17,793**	**$ (19)**	**-0.1%**
Operating Income (Loss)	**$ (16,533)**	**$ (16,501)**	**$ (32)**	**-0.2%**
Total Non-Operating Activities	**-**	**-**	**-**	**-**
Income (Loss) before Capital Contributions	**$ (16,533)**	**$ (16,501)**	**$ (32)**	**0.2%**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

OPERATIONS
CORONADO FERRY

COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ -	$ -	$ -	-
Other Revenue	-	-	-	-
Total Operating Revenue	**$ -**	**$ -**	**$ -**	**-**
Personnel costs	$ -	$ -	$ -	-
Outside services	267	265	(2)	-0.8%
Materials and supplies	-	-	-	-
Energy	-	-	-	-
Risk management	-	-	-	-
General & administrative	-	-	-	-
Vehicle/facility leases	-	-	-	-
Administrative Allocation	-	-	-	0.0%
Total Operating Expenses	**267**	**265**	**(2)**	**-0.8%**
Operating Income (Loss)	**(267)**	**(265)**	**(2)**	**-0.8%**
Total Non-Operating Activities	**267**	**265**	**2**	**0.8%**
Income (Loss) before Capital Contributions	**$ -**	**$ -**	**$ -**	**-**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

ADMINISTRATION
CONSOLIDATED

COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ -	$ -	$ -	-
Other Revenue	25,975	25,496	479	1.9%
Total Operating Revenue	**$ 25,975**	**$ 25,496**	**$ 479**	**1.9%**
Personnel costs	$ 28,155	$ 28,585	$ 430	1.5%
Outside services	23,545	24,069	524	2.2%
Materials and supplies	56	30	(26)	-85.7%
Energy	1,102	1,095	(7)	-0.6%
Risk management	766	796	31	3.9%
General & administrative	4,671	4,683	11	0.2%
Vehicle/facility leases	361	363	2	0.6%
Administrative Allocation	(29,246)	(29,246)	0	0.0%
Total Operating Expenses	**$ 29,411**	**$ 30,375**	**$ 965**	**3.2%**
Operating Income (Loss)	**$ (3,436)**	**$ (4,880)**	**$ 1,444**	**29.6%**
Total Non-Operating Activities	**-**	**231**	**(231)**	**-**
Income (Loss) before Capital Contributions	**$ (3,436)**	**$ (4,649)**	**$ 1,213**	**-26.1%**

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

OTHER ACTIVITIES
CONSOLIDATED

COMPARISON TO BUDGET - FISCAL YEAR 2025
APRIL 30, 2025
(in $000's)

	YEAR TO DATE			
	ACTUAL	**BUDGET**	**VARIANCE**	**VAR. %**
Passenger Revenue	$ -	$ -	$ -	-
Other Revenue	1,105	1,032	73	7.0%
Total Operating Revenue	**$ 1,105**	**$ 1,032**	**$ 73**	**7.0%**
Personnel costs	$ 527	$ 526	$ (1)	-0.1%
Outside services	63	83	20	24.2%
Materials and supplies	-	0	0	-
Energy	3	4	1	19.2%
Risk management	48	48	0	0.9%
General & administrative	59	64	6	8.7%
Vehicle/facility leases	20	18	(2)	-11.2%
Administrative Allocation	5	5	0	0.0%
Total Operating Expenses	**$ 725**	**$ 750**	**$ 24**	**3.3%**
Operating Income (Loss)	**$ 380**	**$ 283**	**$ 97**	**-34.3%**
Total Non-Operating Activities	**-**	**-**	**-**	**-**
Income (Loss) before Capital Contributions	**$ 380**	**$ 283**	**$ 97**	**34.3%**

Metropolitan Transit System

Agenda Item No. 13

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Beyer Boulevard Slope Improvement Construction Management (CM) and Inspection Services – Sole Source Contract Award

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. PWG438.0-25 (in substantially the same format as Attachment A), with Accenture Infrastructure and Capital Projects, LLC ((Accenture); formerly Anser Advisory Management, LLC), for CM and inspection services for the Beyer Boulevard Slope Improvements Project in the amount of $638,267.96.

Budget Impact

The total cost of this contract is estimated to be $638,267.96. The contract will be funded by the Capital Improvement Project (CIP) 2005109001 – Beyer Blvd Track and Slope.

DISCUSSION:

The Beyer Boulevard Slope Improvement project stabilizes the slope supporting the Blue Line Trolley tracks near East Beyer Blvd in San Ysidro. The project also includes drainage improvements to protect the slope once construction is complete. The work involves extensive earthmoving operations and the construction of approximately 675 feet of retaining walls.

In 2020, MTS authorized the transfer of funds to the San Diego Association of Governments (SANDAG) to oversee the design process. Under SANDAG's supervision, RailPros, Inc. (“RailPros”) completed the design. At the completion of design, the project came back to MTS to proceed with construction. During the geotechnical and engineering phases, SANDAG engaged Accenture as the CM due to their expertise in project oversight. Accenture provided consultation services during the early design stages, supported SANDAG through the geotechnical design review process, and had an inspector on site during the boring operations, per SANDAG’s request.

As the project moves into construction, MTS requires CM services to assist staff with the coordination, control, and oversight of the construction contractor through the duration of the work. Given Accenture’s extensive involvement in the early phases of the Beyer Boulevard Slope Improvements project, it is critical to maintain continuity by retaining their services for the

construction phase. This early hands-on experience allowed Accenture to develop an understanding of the project's complexities, including site-specific challenges and design details, which makes them uniquely qualified to oversee the construction phase. Their familiarity with the geotechnical conditions, design details, and project objectives eliminates the need for any learning curve that a new CM firm would face. Introducing a new firm at this stage would likely result in substantial duplication of costs, including redundant efforts, increased time, and a risk of delays, as any new firm would need significant time to familiarize themselves with the project's complexities. Therefore, it is recommended that Accenture, and its team of subconsultants, be selected on a sole source basis to provide CM services during construction for Beyer Boulevard Slope Improvement project.

The scope of CM services includes resident engineering, field inspection, office engineering, project scheduling analysis, geotechnical and environmental testing and observations, surveying, hazardous materials testing, and Quality Assurance (QA) source and field inspections. The Independent Cost Estimate (ICE) for the services was $778,053.20. Based on the level of effort and proposed classifications, Accenture's final cost proposal in the amount of $638,267.96 was determined to be fair and reasonable.

For this project, Accenture will utilize the following subconsultants:

Subconsultant Name	Subconsultant Certification	Subconsultant Amount
Guida Surveying Inc.	Small Business (SB)	$18,419.70
Tierra Data Inc.	Disadvantaged Business Enterprise (DBE), Women Business Enterprise (WBE)	$64,277.00
Verdantas Inc. (Formerly Leighton Consulting Inc.)	None	$98,354.12

Therefore, staff recommend that the MTS Board of Directors authorize the CEO to execute MTS Doc. No. PWG438.0-25 (in substantially the same format as Attachment A), with Accenture, for CM and inspection services for the Beyer Boulevard Slope Improvements Project in the amount of $638,267.96.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. Draft Agreement MTS Doc No. PWG438.0-25

Metropolitan Transit System

STANDARD AGREEMENT

FOR

MTS DOC. NO. PWG438.0-25

BEYER TRACK AND SLOPE CONSTRUCTION MANAGEMENT SERVICES

THIS AGREEMENT is entered into this _____ day of _____, 2025 in the State of California by and between San Diego Metropolitan Transit System ("MTS"), a California public agency, and the following, hereinafter referred to as "Contractor":

Name: Accenture Infrastructure and Capital Projects, LLC

Address: 12680 High Bluff Drive

San Diego, CA 92130
City State Zip

Form of Business: Limited Liability Company
(Corporation, Partnership, Sole Proprietor, etc.)

Email: tyson.atwood@accenture.com

Telephone: 805-459-7697

Authorized person to sign contracts: Tyson Atwood, PE (Name) Senior Vice President (Title)

The Contractor agrees to provide services as specified in the conformed Scope of Work/Technical Specification (Exhibit A), Contractor's Cost/Pricing Form (Exhibit B), and in accordance with the Standard Agreement, including Standard Conditions (Exhibit C), Forms (Exhibit D), and Policy 44C Travel Guidelines for Contractors (Exhibit E).

The contract term is for a period of 60 calendar days.

Payment terms shall be net 30 days from invoice date. Payment for actual performance of services shall be in accordance with this agreement.

SAN DIEGO METROPOLITAN TRANSIT SYSTEM	ACCENTURE INFRASTRUCTURE AND CAPITAL PROJECTS, LLC
By: _____ Sharon Cooney, Chief Executive Officer Approved as to form: By: _____ Karen Landers, General Counsel	By _____ Title: _____

EXHIBIT A
SCOPE OF WORK/TECHNICAL SPECIFICATION

I. PROJECT DESCRIPTION

This project provides safety compliance with the CPUC requirements and enhanced slope and drainage improvements in a segment of the Blue Line South adjacent to the San Ysidro freight yard. MTS requests assistance with construction management and inspection services during the construction of the Beyer Blvd Track and Slope Improvement Project.

Notice to Proceed (NTP) for the construction contract is expected to be issued in September 2025. Construction is expected to be completed in 270 days, by June 2026.

II. EXPECTED RESULTS

Consultant is expected to provide construction management services to manage and administer the construction contract. Services include project controls, contract administration, field inspection, special inspection, quality assurance, and as-needed specialty services and materials testing. Services shall be performed in accordance with MTS policies and procedures and under the management of MTS.

III. SCOPE OF WORK

The scope of work shall consist of the following tasks and deliverables:

Construction Management and Inspection Services

1. Oversee and Monitor construction activities performed by the contractor per project plans and specifications, including periodic job site safety reviews.
2. Prior to the start of construction, perform constructability review of designer's drawings, specifications, cost estimates and schedule assumptions.
3. Prepare daily reports with photographs noting work description, materials, quantities, and pertinent decisions.
4. Maintain project documentation compliant with MTS policies and procedures.
    a. Perform a site photo/video survey to capture existing conditions.
    b. Document pertinent project communication, such as weekly statements of working days, RFIs, submittals, change orders, progress payments, and daily reports.
5. Coordinate and run pre-construction meeting and weekly progress meetings with MTS, contractor, and all other project stakeholders.
    a. Prepare agenda and meeting minutes for all meetings.
6. Perform quality assurance inspection of the work to verify general compliance with the contract documents.
7. Observe the CIDH pile drilling and installation of the soldier piles to verify the drilling depth, concrete, and pile placement.
8. Coordinate construction activities with MTS Operations.
9. Coordinate/verify Contractor's flagging requests with MTS.
10. Update and maintain RFI and Submittal Log each week.
    a. Coordinate reviews of RFIs and Submittals with designer.
11. Payment monitoring to be performed each month.
    a. Maintain accounting of daily quantities of contract bid item or change order work performed.
    b. Assist MTS PM in reviewing contractor's payment applications and assist in determining quantities to be included for payment in the monthly progress payment.
    c. If observed work does not meet contract or change order requirements, prepare, and submit Non- Conformance Report (NCR) to the MTS PM.

12. Review contractor's baseline project schedule and review contractor's regular schedule updates throughout duration of the contract to verify all required activities are included and follows all contract requirements.
    a. Monitor the construction progress with the approved construction schedule and advise the MTS PM of inconsistencies or non-conformance with critical path activities.
    b. Perform independent time-impact analysis if necessary.
13. The Consultant to hire a certified surveying company to verify the contractor's survey control and construction staking for the project.
14. Assist MTS in nearby resident outreach as requested.
15. Assist MTS PM in post construction and project close-out activities as requested.
16. Provide MTS PM of notice of potential change orders as they arise with justification for cost impacts.
    a. Perform an independent cost estimate for change orders prior to contractor's change order estimate to be used in negotiation and preparation of final change order.
    b. Further assist with contract change orders as requested.
17. Provide Geotechnical Observations for Excavation Work
    a. Earthwork Observations and Wall Construction
        i. Perform Quality Assurance (QA) during earthwork construction, including subgrade preparation, wall foundation, and wall backfill to be in compliance with the design concepts and geotechnical recommendations provided in WSP (2024) and Golder (2022) geotechnical reports. Reports shall be provided on a weekly basis. Daily field reports will be submitted each day a soils technician is on site.
        ii. The field technician(s) is expected to perform the following tasks during construction:
            1. Observe and document temporary excavations and perform bottom inspections.
            2. Observe and perform in-situ density tests on remedial grading and compactions to meet the project specifications.
            3. Observe and perform in-situ density tests on embankment fill placement and retaining wall backfill.

        iii. Prepare daily report to document the field activities and observation.
        iv. Collect soil samples periodically for laboratory testing.
    b. Review of submittals and RFIs in relation to Geotechnical work
        i. Review the Construction Documents prepared by Contractor. The review is necessary to verify that the geotechnical recommendations contained in the WSP report (2024) and applicable portions of Sections 4 and 5 for the Golder report (2022) have been properly interpreted and implemented into the design and construction.

c. Perform periodic field soil testing (Lab Tests)
    i. Perform periodic field soil testing, including both in-situ density tests and laboratory testing. This procedure will establish the quality of subgrade and backfill materials and provide comparison against the limited laboratory soil testing in design phase.
d. Prepare As-Graded Geotechnical Report
    i. Upon completion of the successful construction, Consultant's Geotechnical Subconsultant will prepare an As-Graded Geotechnical Report to document the findings of the QA service and final slope outcome. The report will follow the City of San Diego Guidelines for Geotechnical Reports (2018). The report is expected to include the general observation and conclusion of the QA process, site map showing the density tests performed by Consultant's Geotechnical Subconsultant's soil technician(s), laboratory testing results, and compilation of daily reports. Any discrepancy observed from the Construction Plans and Specifications will be documented as well. A DRAFT report will be submitted electronically in PDF format for review by the designer, MTS and their consultants. A FINAL report will be submitted within 2 to 3 weeks after receiving review comments.

18. Provide Environmental Monitoring
    a. Supervision of ESA fence installation and along approved limits of disturbance (Mitigation Measure BIO-7)
    b. Conduct a nesting bird survey to assess the presence/absence of nesting raptors (and other birds) will occur prior to start of work (Mitigation Measure Bio-6) and up to three (3) nest checks will occur to ensure any nest is finished or adequately avoided. Two nesting bird surveys are identified for the start of the bird breeding season in 2026.
    c. Monitor construction activities (as needed) to help ensure that construction does not encroach into ESAs or beyond the approved limits of disturbance. Perform monitoring of clearing, grubbing, and/or grading activities (assumes two-week duration). Monitoring will also be conducted as weekly spot checks during construction (Mitigation Measure BIO-7)
    d. Provide a post-impact construction monitoring report within two months of construction completion. Any exceedances or additional impacts will be described and quantified and appropriate mitigation and permitting recommended.

IV. PERIOD OF PERFORMANCE

The period of performance for the CM services are anticipated to be NTP plus 390 calendar days. This includes pre-construction (2 months prior to construction NTP) and closeout (2 months following substantial completion).

V. SCHEDULE OF SERVICES/MILESTONES/DELIVERABLES

A. Tasks Schedule

Task	Begin/End Dates
CM/Coordination/Inspection Services	NTP plus 330 Calendar Days
Project Closeout and Final Records Transmittal	NTP plus 390 Calendar Days

VI. MATERIALS TO BE PROVIDED BY MTS AND/OR SANDAG

Not Applicable.

VII. SPECIAL CONDITIONS

Not Applicable.

VIII. MTS ACCEPTANCE OF SERVICES:

Firm shall not be compensated at any time for unauthorized work outside of this Work Order. Firm shall provide notice to MTS' Project Manager upon 100% completion of this Work Order. Within five (5) business days from receipt of notice of Work Order completion, MTS' Project Manager shall review, for acceptance, the 100% completion notice. If Firm provides final service(s) or final work product(s) which are found to be unacceptable due to Firms and/or Firms subcontractors negligence and thus not 100% complete by MTS' Project Manager, Firm shall be required to make revisions to said service(s) and/or work product(s) within the Not to Exceed (NTE) Budget. MTS reserves the right to withhold payment associated with this Work Order until the Project Manager provides written acceptance for the 100% final completion notice. Moreover, 100% acceptance and final completion will be based on resolution of comments received to the draft documents and delivery of final documentation which shall incorporate all MTS revisions and comments.

Monthly progress payments shall be based on hours performed for each person/classification identified in the attached Fee Schedule and shall at no time exceed the NTE. Firm shall only be compensated for actual performance of services and at no time shall be compensated for services for which MTS does not have an accepted deliverable or written proof and MTS acceptance of services performed.

IX. DEFICIENT WORK PRODUCT:

Throughout the design and/or implementation phases associated with the services rendered by the Firm, if MTS finds any work product provided by Firm to be deficient and the deficiently delays any portion of the project, Firm shall bear the full burden of their deficient work and shall be responsible for taking all corrective actions to remedy their deficient work product including but not limited to the following:

- Paying applicable delay fees,
- Revising provided documents,

At no time will MTS be required to correct any portion of the Firms deficient work product and shall bear no costs or burden associated with Firms deficient performance and/or work product.

X. DELIVERABLE REQUIREMENTS

Firm will be required to submit any and all documentation required by the Scope of Work. The deliverables furnished shall be of a quality acceptable to MTS. The criteria for acceptance shall be a product of neat appearance, well-organized, and procedurally, technically and grammatically correct. MTS reserves the right to request a change in the format if it doesn't satisfy MTS's needs. All work products will become the property of MTS. MTS reserves the right to disclose any reports or material provided by the Firm to any third party.

Firm shall provide with each task, a work plan showing the deliverables schedule as well as other relevant date needed for Firm's work control, when and as requested by MTS.

Firm's computer data processing and work processing capabilities and data storage should be compatible with Windows compatible PC's, text files readable in Microsoft Word, and standard and customary electronic storage. Firm shall maintain backup copies of all data conveyed to MTS.

Firm shall provide MTS with hard copy or electronic versions of reports and/or other material as requested by MTS.

EXHIBIT B
CONTRACTOR'S COST/PRICING FORM

Attachment B - Consultant Cost Proposal
Task Order Estimate - Summary

Task Order Title:	**Beyer Blvd Slope Improvements - CM Services**
Prime Consultant:	**Accenture**

	Goal	Actual Commitment
BENCH		0.00%
SB		12.96%
FTA DBE - RN		10.07%
FTA-UDBE - RC		0.00%
FHWA - DBE - RC		10.07%
DBE- RN		10.07%

Contract No.:	
Task Order No.:	
Amendment No. :	
Project No.:	

Table 1 - Tasks Summary

Task Item No	WBS Cost - Code	Tasks Description	Labor Hrs	ODC[1]	Total Costs
1	0700-0270	Construction Management Services	3,404	$24,648.00	$638,268
		Totals =	**3,404**	**$24,648.00**	**$638,267.96**

Table 2 - Consultant/Subconsultant Summary (Costs & Hours)

Select with "x" if applicable						Consultant	Labor Hrs	ODC[1]	Total Costs	% of Task Order
Prevailing Wage	BENCH	DBE	UDBE	SB	OTHER					
X						Accenture (formerly Anser)	2,342	$ 19,900.00	$ 457,217.14	71.6%
X				X		Guida	92	$ -	$ 18,419.70	2.9%
X		X		X		Tierra Data	560	$ 5,674.20	$ 64,277.00	10.1%
						Verdantas (formerly Leighton)	410	$ 4,748.00	$ 98,354.12	15.4%
						Totals =	**3,404**	**$ 30,322.20**	**$ 638,267.96**	**100%**

[1]All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide.

Attachment B - Consultant Cost Proposal
Task Order Estimate - Hourly Breakdown

Total Hours = 2,342
Total Costs = $457,217.14

Consultant/Subconsultant: **Accenture (formerly Anser)**

Task Order Title: **Beyer Blvd Slope Improvements - CM Services**

Contract No.:
Task Order No.:
Amendment No.:

Item	WBS Cost -Code	Task Description	ODCs	Tyson Atwood Engineer, Supervising $243.43	Brandon McKay Engineer, Senior $217.81	Javier Chavez Prevailing Wage Inspector $182.44	Gysandra Preciado Engineer II $153.75										Total Hours	Totals	Percent of Total Hours	Percent of Total Costs
1	0700-0270	Construction Management Services																		
1.1		Pre-Construction		4	120		20										144	$30,185.92		
1.2		Construction		18	436	1280	400										2,134	$394,370.10		
1.3		Post-Construction		4	40		20										64	$12,761.12		
		Total ODCs for this task	$19,900.00															$19,900.00		
		Subtotals (Hours) =	N/A	26	596	1280	440										2,342	$457,217.14		
		Subtotals (Costs) =	$19,900.00	$6,329.18	$129,814.76	$233,523.20	$67,650.00										**2,342**	**$457,217.14**	100.0%	100.0%
																	Totals =	**2,342**	**$457,217.14**	

Totals (Summary) =

Total (Hours) =	N/A	26	596	1,280	440										2,342	
Total (Costs) =	$19,900.00	$6,329.18	$129,814.76	$233,523.20	$67,650.00											$457,217.14
Percentage of Total (Hours) =	N/A	1.1%	25.4%	54.7%	18.8%										100.0%	
Percentage of Total (Costs) =	4.4%	1.4%	28.4%	51.1%	14.8%											100.0%

Actual hours to be billed at SANDAG approved Master Billing Rates

Attachment B - Consultant Cost Proposal
Task Order Estimate - Other Direct Costs (ODCs)

Consultant/ Subconsultant: **Accenture (formerly Anser)**

Task Order Title: **Beyer Blvd Slope Improvements - CM Services**

Contract No:

Task Order No.:

Amendment No.:

TASKS (1-5)

ODC Item	Description	Unit	Unit Cost	1		2		3		4		5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Vehicle	Month	$1,250.00	14.0	$17,500.00								
2													
3													
4	Misc. Office Supplies	Month	$200.00	12.0	$2,400.00								
5													
6													
7													
8													
9													
10													
11													
12													
13													
			Subtotal =		**$19,900.00**	Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS (6-10)

ODC Item	Description	6		7		8		9		10		Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Vehicle											**14**	**$17,500.00**
2													
3													
4	Misc. Office Supplies											**12**	**$2,400.00**
5													
6													
7													
8													
9													
10													
11													
12													
13													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	**$19,900.00**

NOTE: All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide. Monthly vehicle rates to be prorated by actual hours worked by employee assigned to vehicle.

Attachment B - Consultant Cost Proposal
Task Order Estimate - Hourly Breakdown

Consultant/Subconsultant: **Guida**

Contract No.:

Task Order No.:

Amendment No.:

Total Hours = **92**

Total Costs = **$18,419.70**

Task Order Title: **Beyer Blvd Slope Improvements - CM Services**

Item	label	TASKS/WBS Description	ODCs	Surveyor, Senior	Admin II	Surveyor II										Total Hours	Totals	Percent of Total Hours	Percent of Total Costs
				$221.07	$117.36	$195.14													
1	0700-0270	Construction Management Services																	
1.1	Construction (Survey)			42	8	42										92	$18,419.70		
	Total ODCs for this task																		
		Subtotals (Hours) =	N/A	42	8	42										92	$18,419.70		
		Subtotals (Costs) =		$9,284.94	$938.88	$8,195.88										**92**	**$18,419.70**	100.0%	100.0%
																Totals =	**92**	**$18,419.70**	
		Totals (Summary) =																	
		Total (Hours) =	N/A	42	8	42										92			
		Total (Costs) =		$9,284.94	$938.88	$8,195.88											$18,419.70		
		Percentage of Total (Hours) =	N/A	45.7%	8.7%	45.7%										100.0%			
		Percentage of Total (Costs) =		50.4%	5.1%	44.5%											100.0%		

Actual hours to be billed at SANDAG approved Master Billing Rates

Attachment B - Consultant Cost Proposal
Task Order Estimate - Other Direct Costs (ODCs)

Consultant/ Subconsultant: **Guida**

Task Order Title: **Beyer Blvd Slope Improvements - CM Services**

Contract No:

Task Order No.:

Amendment No.:

TASKS (1-5)

ODC Item	Description	Unit	Unit Cost	1		2		3		4		5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
			Subtotal =			Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS (6-10)

ODC Item	Description	6		7		8		9		10		Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	

NOTE: All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide. Monthly vehicle rates to be prorated by actual hours worked by employee assigned to vehicle.

Attachment B - Consultant Cost Proposal
Task Order Estimate - Hourly Breakdown

Consultant/Subconsultant: **Tierra Data**

Contract No.:

Total Hours = **560**

Task Order No.:

Total Costs = **$64,277.00**

Task Order Title: **Beyer Blvd Slope Improvements - CM Services**

Amendment No.:

Item	label	TASKS/WBS Description	ODCs	Biologist II	Biologist III	GIS Specialist, Senior	Admin, Senior									Total Hours	Totals	Percent of Total Hours	Percent of Total Costs
				$92.03	$111.20	$153.38	$130.65												
1	0700-0270	Construction Management Services																	
1.1		Environmental Compliance Monitoring		320	160	40	40									560	$58,602.80		
1.2																			
1.3																			
1.4																			
1.5																			
1.6																			
1.7																			
		Total ODCs for this task	$5,674.20														$5,674.20		
		Subtotals (Hours) =	N/A	320	160	40	40									560	$64,277.00		
		Subtotals (Costs) =	$5,674.20	$29,449.60	$17,792.00	$6,135.20	$5,226.00									**560**	**$64,277.00**	100.0%	100.0%

Totals = **560** **$64,277.00**

Totals (Summary) =

Total (Hours) =	N/A	320	160	40	40									560		
Total (Costs) =	$5,674.20	$29,449.60	$17,792.00	$6,135.20	$5,226.00										$64,277.00	
Percentage of Total (Hours) =	N/A	57.1%	28.6%	7.1%	7.1%									100.0%		
Percentage of Total (Costs) =	8.8%	45.8%	27.7%	9.5%	8.1%										100.0%	

Actual hours to be billed at SANDAG approved Master Billing Rates

Attachment B - Consultant Cost Proposal
Task Order Estimate - Other Direct Costs (ODCs)

Consultant/ Subconsultant: **ECORP**

Contract No:

Task Order No.:

Task Order Title: **Slope and Drainage Improvement Along San Ysidro Yard**

Amendment No.:

TASKS (1-5)

ODC Item	Description	Unit	Unit Cost	1		2		3		4		5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Mileage	miles	$0.70	8,106	$5,674.20								
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
				Subtotal =	$5,674.20	Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS (6-10)

ODC Item	Description	6		7		8		9		10		Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Mileage											8,106	$5,674.20
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Totals =	$5,674.20

NOTE: All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide. Monthly vehicle rates to be prorated by actual hours worked by employee assigned to vehicle.

Attachment B - Consultant Cost Proposal
Task Order Estimate - Hourly Breakdown

Total Hours = 410
Total Costs = $98,354.12

Consultant/Subconsultant: **Verdantas (formerly Leighton)**
Task Order Title: **Beyer Blvd Slope Improvements - CM Services**

Contract No.:
Task Order No.:
Amendment No.:

Item	label	TASKS/WBS Description	ODCs	Engineer, Supervising	Engineer, Senior	Admin, Senior	Geologist, Senior	PW Soils Technician	GIS Specialist, Senior								Total Hours	Totals	Percent of Total Hours	Percent of Total Costs
				$301.37	$210.95	$109.80	$187.91	$235.88	$175.38											
1		Material Sampling, Testing, and As-Graded Report																		
1.1	Task Order Management			16	34	10	30	310	10								410	$93,606.12		
	Total ODCs for this task		$4,748.00															$4,748.00		
		Subtotals (Hours) =	N/A	16	34	10	30	310	10								410	$98,354.12		
		Subtotals (Costs) =	$4,748.00	$4,821.92	$7,172.30	$1,098.00	$5,637.30	$73,122.80	$1,753.80								**410**	**$98,354.12**	100.0%	100.0%
																Totals =	**410**	**$98,354.12**		

Totals (Summary) =

Total (Hours) =	N/A	16	34	10	30	310	10								410	
Total (Costs) =	$4,748.00	$4,821.92	$7,172.30	$1,098.00	$5,637.30	$73,122.80	$1,753.80									$98,354.12
Percentage of Total (Hours) =	N/A	3.9%	8.3%	2.4%	7.3%	75.6%	2.4%								100.0%	
Percentage of Total (Costs) =	4.8%	4.9%	7.3%	1.1%	5.7%	74.3%	1.8%									100.0%

Actual hours to be billed at SANDAG approved Master Billing Rates

Attachment B - Consultant Cost Proposal
Task Order Estimate - Other Direct Costs (ODCs)

Consultant/ Subconsultant: **Verdantas**

Contract No:

Task Order No.:

Task Order Title: **Beyer Blvd Slope Improvements - CM Services**

Amendment No.:

TASKS (1-5)

ODC Item	Description	Unit	Unit Cost	TO Management		Field Observation and Testing		Final Reporting		4		5	
				Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Mileage	Miles	$0.67	3,400	$2,278.00								
2	Proctor (ASTM D1557)	Ea	$160.00	4	$640.00								
3	Sieve Analysis	Ea.	$135.00	4	$540.00								
4	Expansion Index	Ea.	$130.00	2	$260.00								
5	Corrosion Series	Ea.	$265.00	2	$530.00								
6	Concrete Compression Test	Ea.	$25.00	20	$500.00								
7													
8													
9													
10													
11													
12													
13													
			Subtotal =		**$4,748.00**	Subtotal =		Subtotal =		Subtotal =		Subtotal =	

TASKS (6-10)

ODC Item	Description	6		7		8		9		10		Totals	
		Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total	Quantity	Total
1	Mileage											**3,400**	**$2,278.00**
2	Proctor (ASTM D1557)											**4**	**$640.00**
3	Sieve Analysis											**4**	**$540.00**
4	Expansion Index											**2**	**$260.00**
5	Corrosion Series											**2**	**$530.00**
6	Concrete Compression Test											**20**	**$500.00**
7													
8													
9													
10													
11													
12													
13													
		Subtotal =		Subtotal =		Subtotal =		Subtotal =		Subtotal =		**Totals =**	**$4,748.00**

NOTE: All ODCs will be billed at actuals, supported by receipts and per Caltrans Travel and Expense Guide. Monthly vehicle rates to be prorated by actual hours worked by employee assigned to vehicle.

EXHIBIT C
IN ACCORDANCE WITH THE STANDARD AGREEMENT, INCLUDING STANDARD CONDITIONS

7.1. INDEPENDENT CONTRACTOR

Contractor hereby declares that it is engaged in an independent business and agrees that in the performance of this Agreement it shall act as an independent contractor and not as an employee of MTS. Contractor has and hereby retains full control of all the employment, compensation, and discharge of all employees of Contractor assisting in its performance hereunder. Contractor shall be fully responsible for all matters relating to payment of its employees, including compliance with Social Security, withholding tax, and all other laws and regulations governing such matters. Contractor shall be responsible for its own acts and those of its agents and employees during the term of this Agreement. MTS shall be responsible for its own acts and those of its agents and employees during the term of this Agreement. Except as otherwise specifically provided, as an independent contractor, Contractor is solely responsible for determining the means and methods of performing the services described in the scope of work. Contractor shall perform the work contemplated with resources available within its own organization.

7.2. INSURANCE

Contractor will include the contract number on all insurance-related correspondence, i.e., the insurance certificate itself.

All policies required shall be issued by companies who are licensed or approved to do business in the State of California and hold a current policyholder's alphabetic and financial-size category rating of not less than A-VI, in accordance with A.M. Best.

MTS utilizes the services of a third-party insurance monitoring company. As a condition of contract award, Contractor shall submit any required insurance policies to the third-party monitoring company of MTS' choosing.

7.3. COVERAGE REQUIRED - ALL CONTRACTS

(1) Liability

(a) Commercial General Liability At all times during this contract and, with respect to Products and Completed Operations Liability, for twelve (12) months following the acceptance of the work by MTS, Contractor agrees to maintain Commercial General Liability Insurance utilizing Insurance Services Office (ISO) coverage form CG0001, edition date 10/01 or later, or an equivalent form and with insurance companies acceptable to MTS. The coverage shall contain no restricting or exclusionary endorsements with respect to the performing of services described in the scope of work.

All such policies shall name in the endorsement San Diego Metropolitan Transit System (MTS), San Diego Trolley, Inc. (SDTI), San Diego and Arizona Eastern Railway (SD&AE), San Diego and Imperial Valley Railroad (SD&IV), and San Diego Transit Corporation (SDTC), their directors, officers, agents, and employees as additional insureds as their interests may appear.

(b) Automobile Liability At all times during this contract, Contractor agrees to maintain Automobile Liability Insurance for bodily injury and property damage including coverage for all owned, nonowned, and hired vehicles.

(c) Workers' Compensation/Employer Liability At all times during this contract, Contractor agrees to maintain Workers' Compensation and Employers' Liability Insurance in compliance with the applicable statutory requirements. Contractor waives any rights of subrogation against MTS, SDTI, SD&AE, SD&IV, and SDTC, and the policy form must permit and accept such waiver.

7.4. ADDITIONAL COVERAGES REQUIRED (AS INDICATED)

¨ (1) Owner-Provided Builder's Risk
PROVIDED

MTS will provide Builder's Risk Insurance on a special form basis, excluding the perils of earthquake and flood, at a limit of not less than the full replacement value of the work and covering the work and all materials and equipment to be incorporated therein, including property in transit elsewhere, and insuring the interests of the Contractor, subcontractors, materialmen, and MTS, SDTI, SD&AE, SD&IV, SDTC, MTS' contractor for design, and MTS' contractor for construction management. However, Contractor is responsible for the portion of any loss that is within the deductible amount of this Builder's Risk Insurance, which is currently at $50,000 but is subject to change.

þ (2) Railroad Protective or Equivalent
REQUIRED

Any exclusions relating to performance of operations within the vicinity of any railroad, bridge, trestle, track, roadbed, tunnel, underpass, or crossing must be deleted. Option: purchase separate Railroad Protective Liability Policy as required.

þ (3) Professional Liability
REQUIRED

At all times during this contract, and for twelve (12) months following acceptance of work by owner, Contractor agrees to maintain Professional Liability Insurance with respect to services or operations under this Agreement.

¨ (4) Pollution Legal Liability
REQUIRED

At all times during this contract, and for twenty-four (24) months following, Contractor agrees to maintain Pollution Legal Liability Insurance with respect to services or operations under this Agreement. The extended discovery period must be no less than twenty-four (24) months.

¨ (5) Contractor Equipment
REQUIRED

At all times during this contract, Contractor agrees to maintain Contractor's Equipment Insurance on a special form basis covering equipment owned, leased, or used by Contractor. Contractor waives any rights of subrogation against MTS, SDTI, SD&AE, SD&IV, and SDTC, and the policy form must permit and accept such waiver. Contractor hereby releases and holds harmless MTS for any loss or damage to its equipment.

¨ (6) Installation Floater
REQUIRED

At all times during this contract, Contractor agrees to maintain Installation Floater Insurance on a special form basis covering property owned or provided by Contractor. Contractor waives any rights of subrogation against MTS, SDTI, SD&AE, SD&IV, and SDTC, and the policy form must permit and accept such waiver. Contractor hereby releases and holds harmless these entities for any loss or damage to its property.

¨ (7) Garage Keeper's Legal Liability & Automobile Portion
REQUIRED

At all times during this contract, Contractor agrees to maintain Garage Keeper's Legal Liability as well Automobile Portion which covers the risk of loss or damage to MTS vehicles while in the care, custody or control of Contractor. Automobile portion shall cover the Contractor in the event of a vehicle accident while they are driving a MTS vehicle, which results in a third party claim of physical damage or bodily injury.

¨ (8) Crime Fidelity Insurance
REQUIRED

At all times during this contract, Contractor agrees to maintain Crime Fidelity Insurance with respect to services or operations under this agreement. The coverage should include the following:

- Employee dishonesty/theft
- Theft, disappearance and destruction on the premises
- Theft, disappearance and destruction while in transit
- Forgery/alteration

¨ (9) Umbrella or Excess Liability (if required to meet liability limits above)
REQUIRED

Contractor agrees that any Umbrella or Excess Liability Policy utilized to provide the required limits of liability shall contain coverage at least as broad as that provided by the General Liability Policy, and be written for a term concurrent with the General Liability Policy.

þ (10) Primary and Non-Contributory Insurance
REQUIRED

Contractor agrees that all general liability coverages required under this insurance section are PRIMARY and that any insurance of MTS, SDTI, SD&AE, SD&IV, and SDTC shall be excess and noncontributory (endorsement required).

7.5. MINIMUM POLICY LIMITS REQUIRED

	Limits
Commercial General Liability (Per Occurrence):	$3,000,000
(General Aggregate)	$6,000,000
(Completed Operations & Products Aggregate)	$2,000,000
Automobile Liability: (Combined Single Limit)	$2,000,000
Worker's Compensation:	Statutory Limits
Employer's Liability per Accident/or Disease:	$1,000,000

Additional Coverages (as indicated under Section B, Additional Coverages Required):

¨	B (1) Builder's Risk	Replacement Cost
þ	B (2) Railroad Protective	$3,000,000
	(Aggregate)	$6,000,000
þ	B (3) Professional Liability	$2,000,000
¨	B (4) Pollution Liability	$
¨	B (5) Contractor Equipment	Replacement Cost
¨	B (6) Installation Floater	Replacement Cost
¨	B (7) Garage Keeper's Legal Liability	$
	(Combined Single Limit (CSL)	Per Occurrence)
¨	B (8) Crime Fidelity Insurance	$
þ	B (9) Umbrella or Excess Liability	$
	(if required to meet liability limits above)	

7.6. NOTICE OF POLICY CHANGES

Contractor shall not amend or cancel the insurance policy and coverage required by this Agreement without providing MTS with at least thirty (30) days prior written notice. Contractor shall notify MTS within ten (10) days of insurer-initiated material amendments or cancellations to the insurance coverage required by this Agreement. Under no circumstances shall these notice provisions be deemed a waiver of the insurance requirements set for herein. Any material changes in or cancellation of the insurance policy on file with MTS pursuant to Section 2(E) will result in an immediate stop work order until proof of substitute coverage meeting the requirements of this Agreement is provided to MTS. In the alternative, in MTS' sole discretion, MTS retains the right to declare Contractor in default and immediately terminate this Agreement if the insurance coverage required by this Section 2 is cancelled, otherwise lapses or fails to meet the coverage limits at any time, and for any duration, during the term of this Agreement.

7.7. EVIDENCE REQUIRED

Within ten (10) working days following receipt of notice that a contract has been awarded, Contractor shall have provided the MTS Contracts Specialist with satisfactory certification by a qualified representative of the Insurer(s) that Contractor's insurance complies with all provisions in this insurance section.

7.8. SPECIAL PROVISIONS

The foregoing requirements as to the types and limits of insurance coverage to be maintained by Contractor, and any approval of said insurance by MTS, SDTI, SD&AE, SD&IV, and SDTC, or their insurance Contractor(s) are not intended to and shall not in any manner limit or qualify the liabilities and obligations otherwise assumed by Contractor pursuant to this Agreement, including but not limited to the provisions concerning indemnification.

MTS reserves the right to withhold payments to Contractor in the event of material noncompliance with the insurance requirements outlined above.

7.9. TERMINATION OF AGREEMENT

A. TERMINATION FOR CONVENIENCE

Performance under this agreement may be terminated by MTS in accordance with this clause in whole or, from time-to-time, in part, whenever MTS shall elect. Any such termination shall be affected by delivery to Contractor of a Notice of Termination specifying the extent to which performance under this agreement is terminated, and the date upon which such termination becomes effective. Upon receipt of any such notice, Contractor shall, unless the notice requires otherwise:

(1) immediately discontinue performance on the date and to the extent specified in the notice;

(2) place no further orders for materials other than as may be necessarily required for completion of such portion of the agreement that is not terminated;

(3) promptly make every reasonable effort to either obtain cancellation on terms satisfactory to MTS of all orders to Contractor's suppliers to the extent they relate to the performance of that portion terminated, or upon MTS concurrence assign to MTS those orders; and

(4) assist MTS, upon request, in the maintenance, protection, and disposition of property acquired by MTS under this agreement.

If claimed in writing within thirty (30) calendar days after Notice of Termination, MTS will pay to Contractor an equitable adjustment to include (without duplication of any item):

(1) all amounts due and not previously paid to Contractor for goods completed in accordance with this agreement prior to such notice;

(2) a reasonable amount for any goods and materials then in production; provided that no such adjustment be made in favor of Contractor with respect to any goods which are Contractor's standard stock;

(3) costs of settling and paying supplier's claim arising out of the canceled orders; and

(4) a reasonable profit for costs incurred in the performance of that portion terminated; provided, however, that if it appears that Contractor would have sustained a loss on the entire agreement had it been completed, no profit shall be included.

The total sum to be paid to Contractor under this clause, shall not exceed the total order price as reduced by the amount of payments otherwise made, and as further reduced by the order price of that portion not terminated, and will not include any consideration for loss of anticipated profits on the terminated portion all claims for which seller agrees to waive.

7.10. TERMINATION FOR DEFAULT

In case of Contractor breach or failure to perform, MTS reserves the right to terminate the contract for default. MTS may award the contract to the next lowest responsive, responsible Proposer, solicit new bids, or pursue any other remedy authorized by law.

In addition to any remedy authorized by law, money due to the Contractor under and by virtue of contract, as shall be considered necessary by MTS, may be retained by MTS until disposition has been made of such suits or claims for damages. The retention of money due to the Contractor shall be subject to the following:

(1) MTS will give the Contractor ten (10) days' notice of its intention to retain funds from any partial payment, which may become due to the Contractor prior to acceptance by MTS of the contract. Retention of funds from any payment made after acceptance may be made without such prior notice to the Contractor.

(2) No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments.

(3) If MTS has retained funds, and it is subsequently determined that MTS is not entitled to be indemnified and saved harmless by the Contractor in connection with the matter for which such retention was made, MTS shall be liable for interest earned on the amount retained for the period of such retention.

MTS may terminate the contract by serving a notice of termination on the Contractor. Notice shall set forth the manner in which the Contractor is in default, and provide the Contractor with ten (10) days' time to cure the default to the satisfaction of MTS. This cure period may be adjusted if the parties so agree in writing. If MTS determines after the cure period that the default is not cured, MTS will issue a "show cause" letter to the Contractor requesting from the Contractor reasons why this contract should not be terminated.

If MTS does not find that the Contractor has demonstrated sufficient reason for its failure to cure, the contract shall be deemed terminated. The Contractor shall only be paid the contract price for supplies received and accepted, or services performed in accordance with the manner set forth in the contract. If MTS determines that the Contractor had an excusable reason for not performing such as a strike, fire, flood, or other events, which are not the fault of, or beyond the control of the Contractor, MTS may allow the Contractor to continue work or terminate the contract for convenience.

7.11. INDEMNITY

A. General

With regard to the Contractor's performance in connection with or incidental to this Agreement, but excluding its performance of professional services and the indemnification and hold harmless aspects thereto as set forth below, the Contractor agrees to defend, indemnify, protect and hold MTS and its directors, officers, and employees as well as any additional insured identified pursuant to this Agreement, harmless from and against any and all claims asserted or liability established for damages or injuries to any person or property, including injury to the Contractors' or its subcontractors' employees, agents, or officers, which arise from or are connected with or are caused or claimed to be caused by the negligent, reckless, or willful acts or omissions of the Contractors and its subcontractors and their agents, officers, or employees, in performing the work or services herein, and all expenses of investigating and defending against same, including attorney's fees and costs; provided, however, that the Contractor's duty to indemnify and hold harmless shall not include any claims or liability arising from the established sole

negligence or willful misconduct of MTS, its directors, agents, officers, employees, or additional insureds.

B. Professional Services

With regard to the Contractor's performance of professional services, the Contractor agrees to defend, indemnify, and hold harmless MTS, its directors, officers, and employees, as well as any additional insured identified pursuant to this Agreement, from and against any and all claims, costs, suits, and damages, including, but not limited to, reasonable attorney's fees and losses or payments for injury to any person or property arising out of, pertaining to or relating to the negligent, reckless or willful acts, errors, or omissions of the Contractor and/or its subcontractor associated with the Project.

C. Survival of Indemnification

This Section of the Agreement shall apply to all liability, regardless of whether any insurance policies are applicable. The policy limits do not act as a limitation upon the amount of indemnification to be provided by Contractor. This Section of the Agreement shall survive in perpetuity. Subject to any applicable statutes of limitation and/or repose.

D. Job Site Safety

MTS agrees that, in accordance with generally-accepted construction practices, the construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction on the Project, including safety of all persons and property, and that this requirement shall be made to apply continuously and RFQ No. 5007809 158 RFQ Attachment 20 not be limited to normal working hours. Contractor shall not have control over or charge of, and shall not be responsible for, construction means, methods, techniques, sequences, or procedures, as these are solely the responsibility of the construction contractor.

7.12. ASSIGNABILITY

(a) By MTS. This contract is assignable, in whole or in part, to any other government agency, including the North County Transit District and/or the San Diego Association of Governments and/or the Metropolitan Transit System. The party wishing to exercise the assignment (also known as a "piggyback") shall perform an independent cost estimate to determine fair and reasonable pricing, and shall enter into its own contract with the vendor based upon the terms and conditions of this IFB. Any assignment or piggyback shall comply with Federal Transit Administration (FTA) requirements if applicable. MTS shall have no responsibility or liability for any such assignment or piggyback.

(b) By Contractor. Any attempt by Contractor to assign, subcontract, or transfer all or part of this Agreement shall be void and unenforceable without MTS' prior written consent; which consent shall not be unreasonably withheld. Any such consent shall not relieve Contractor from full and direct responsibility for all services performed prior to the date of assigning, subcontracting, or transferring this Agreement.

7.13. SUBCONTRACTORS

Contractor agrees to bind every subcontractor to the terms of the Agreement as far as such terms are applicable to subcontractor's portion of the Work. Contractor shall be as fully responsible to

MTS for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by its subcontractors, as Contractor is for acts and omissions of persons directly employed by Contractor. Nothing contained in this Agreement shall create any contractual relationship between any subcontractor and MTS. MTS reserves the right to approve all subcontractors. MTS's approval of any subcontractor under this Agreement shall not in any way relieve Contractor of its obligations under this Agreement.

7.14. NOTICES

All notices or other communications to either party by the other shall be deemed given when made in writing and deposited in the United States Post Office, addressed as follows:

To MTS:

San Diego Metropolitan Transit System (MTS)
Attention: Chief Executive Officer
1255 Imperial Avenue, Suite 1000
San Diego, CA 92101-7490

To Contractor:

As shown on front page.

7.15. CONSIDERATION PAID

MTS shall reimburse the Contractor for actual costs (including labor costs, employee benefits, overhead, and other direct costs incurred by the Contractor in performance of the work. Actual costs shall not exceed the estimated wage rates established in the negotiations between the Parties.

Fees and all other charges will be billed as identified in this agreement, and the net amount shall be due at the time of billing, unless otherwise specified.

Payments will be made as set forth in this agreement; however, payments may be withheld or portions thereof may be deducted or setoffs may be made against Contractor if Contractor is not performing work in accordance with the applicable provisions of this Agreement. The time for payment of invoices or for accepting any discounts offered shall run only from the date of receipt of correct invoices with required certification documents by MTS.

Travel reimbursement and expenses shall be in accordance with MTS's travel policy 44-C.

7.16. EQUAL EMPLOYMENT OPPORTUNITY PROGRAM

A. MTS's Equal Employment Opportunity Program: MTS' Equal Employment Opportunity Program for Contractors, MTS Policy No. 25, is part of this Agreement (a copy can be obtained from MTS' Clerk of the Board). A Workforce Report form signed by the Contractor is a condition for the award of this contract.

B. Contractor's Equal Employment Opportunity Plan: Each Contractor who provides MTS labor, equipment, materials and services of $50,000 or more per year with fifty (50) or more employees shall have, maintain, and submit an Equal Employment Opportunity Plan to the Director of Human Resources and Labor Relations for MTS each year of the

contract, and a Workforce Utilization Report on or before January 1 and July 1 for each year of the contract. The objective of this plan is to assure that the Contractor will not discriminate against any employee or applicant for employment because of race, color, national origin, sex, religion, disability or age.

C. Compliance with Regulations: The Contractor agrees to take action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, national origin, sex, religion, disability or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

In accordance with Title VII of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable Equal Employment Opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e and as further amended by Executive Order 13672, “Further Amendments to Executive Order 11478, Equal Employment Opportunity in the Federal Government, and Executive Order 11246, Equal Employment Opportunity”), and any federal statutes, executive orders, regulations and federal policies that may in the future affect construction activities undertaken in the course of the Project.

D. Incorporation of Provisions: The Contractor shall include the above provisions of subsection C “Compliance with Regulations” in every subcontract unless exempt by the regulations, or directives issued pursuant thereto.

7.17. COST PRINCIPLES

Contractor and any subcontractors agrees that the Contract Cost Principles and Procedures, 48 CFR, Federal Acquisition Regulations System, Chapter 1, Part 31, et seq., shall be used to determine the allowability of individual project cost items.

Contractor and its subcontractors shall comply with Federal administrative procedures in accordance with 2 CFR, Part 200, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.

Contractor and its subcontractors shall establish and maintain an accounting system and records that properly accumulate and segregate incurred project costs and matching funds by line item for the project. The accounting system of Contractor and its subcontractors shall conform to Generally Accepted Accounting Principles (GAAP) and enable the determination of incurred costs at interim points of completion.

Any costs for which payment has been made that are determined by a subsequent audit to be unallowable under the provisions above are subject to repayment by the Contractor to MTS.

7.18. CHANGES IN WORK

No payment for changed or additional work shall be made unless the changed or additional work has first been approved in writing by the MTS Project Manager and the parties have agreed upon the appropriate adjustment, if any, to the payment schedule and maximum payment amount for the changed or additional work. The written notice of potential change in work be given to MTS prior to the time Contractor shall have performed the work within fifteen (15) days after the happening of the event, thing, occurrence, or other cause, giving rise to the potential change in work.

The MTS Project Manager may order changes or additions to the scope of work. Whether a change or addition to the scope of work is proposed by the Contractor or ordered by the MTS Project Manager, the parties shall in good faith negotiate an appropriate adjustment, if any, to the payment schedule and maximum payment for the changed or additional work. An approved change or addition, along with the payment adjustment, if any, will be effective upon an amendment to this contract executed by both parties. The amendment shall not render ineffective or invalidate unaffected portions of this contract.

7.19. LITIGATION EXPENSES

If any action in law or equity, including an action for declaratory relief, is brought to enforce or interpret the provisions of this Agreement, each Party shall pay its own attorneys' fees.

7.20. EXCLUSIVE USE

The services hereunder are provided for the exclusive use of MTS and such services, data, recommendations, proposals, reports, design criteria, and similar information provided by Contractor, are not to be used or relied upon by other parties except as authorized by MTS.

7.21. DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION

This project is subject to Title 49, Code of Federal Regulations part 26 (49 CFR Part 26), entitled "Participation by Disadvantaged Business Enterprises (DBEs) in Department of Transportation (DOT) Financial Assistance Programs." MTS' DBE program has an aspirational goal of 5.6% participation by certified DBE's over Federal Fiscal years 2025-2027 (October 1, 2024 – September 30, 2027) time period. There is no specific DBE contract goal for this project.

In order to help MTS, achieve its federally mandated overall DBE goal, MTS encourages the participation of DBEs as defined in 49 CFR 26 in the performance of contracts financed, in whole or in part, with federal funds. It is the policy of MTS to ensure that DBEs, as defined in 49 CFR Part 26, have an equal opportunity to receive and participate in MTS DOT-assisted contracts. It is also our policy to:

1. Ensure nondiscrimination in the award and administration of all MTS contracts and subcontracts;
2. Create a level playing field by which DBEs can compete for and perform in MTS DOT-assisted contracts;
3. Ensure that the MTS DBE Program is narrowly tailored in accordance with applicable law and current legal standards, including the Ninth Circuit Ruling in Western States Paving vs. Washington State Department of Transportation;
4. Ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are permitted to participate as DBEs;

5. Help remove procurement and contracting barriers, which impede DBE participation in MTS DOT-assisted contracts;
6. Monitor and enforce contractors' compliance in meeting established goal objectives and program requirements;
7. Assist in the development of DBEs and Small Businesses to increase their ability to compete successfully in the market place outside the DBE Program;
8. Ensure MTS contractors and subcontractors take all necessary; and reasonable steps to comply with these policy objectives.

To ascertain whether its overall DBE goal is being achieved, MTS is tracking DBE participation on all federal-aid contracts. Therefore, all bidders and successful Contractors are required to:

- Complete MTS's Designation of Subcontractors and "DBE Program – Information for MTS's Bidder List"

MTS encourages the proposer to outreach to DBEs and other small business enterprises for any potential subcontracting opportunities on this project. Contractor is also encouraged to use services offered by financial institutions owned and controlled by DBEs. For bonding or financial assistance resources, visit www.sba.gov.

Contractor shall be fully informed in respect to the requirements of the DBE regulations. The DBE regulations in their entirety are incorporated herein by this reference (see 49 CFR 26). Contractor's attention is directed to the following matters:

A. A DBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, vendor of materials or supplies, manufacturer, regular dealer or trucking company. DBE participation will be counted toward MTS's overall DBE goal per the DOT Regulations stated in 49 CFR 26.55.

B. A DBE must perform a commercially useful function; i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing, and supervising the work.

C. DBEs must be certified by the California Unified Certification Program (CUCP). Listings of DBEs certified by the CUCP are available from the following sources: To view the CUCP statewide DBE Directory, please use the following link: http://californiaucp.org/.

D. If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification.

E. The contractor must promptly notify MTS whenever a DBE subcontractor performing work related to this contract is terminated or fails to complete its work, and must make good faith efforts to engage another DBE subcontractor to perform at least the same amount of work. The contractor may not terminate any DBE subcontractor and perform that work through its own forces or those of an affiliate without prior written consent of MTS.

7.22. PROMPT PAYMENTS TO SUBCONTRACTORS

A. A Contractor or subcontractor shall pay each subcontractor participating on the contract for satisfactory completion of accepted work no later than 30 calendar days from the receipt of each payment the Contractor receives from MTS. Any subcontractor will also be required to pay any lower-tier subcontractors no later than 30 calendar days from the receipt of each payment from the Contractor. Any retainage kept by the Contractor or by a subcontractor must be paid in full to the subcontractor in thirty (30) calendar days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment over 30 calendar days may occur only for good cause following written approval of MTS.

Failure to comply with this provision will constitute noncompliance, which may result in the application of legal and contract remedies, including, but not limited to, Contractor not being reimbursed for work performed by subcontractors unless and until the prime contractor ensures that the subcontractors are promptly paid for the work they have satisfactorily completed, contract termination and/or other remedy as deemed appropriate by MTS. This requirement shall not be construed to limit or impair any contractual, administrative or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late or nonpayment by the Contractor, deficient subcontractor performance or noncompliance by a subcontractor.

This section applies to both DBE and non-DBE subcontractors and Contractor must require this clause be included in its subcontracts and lower-tier subcontracts related to the performance of this contract.

B. If any subcontractors, Contractor must submit the MTS Prompt Payment Certification Form to MTS with their invoice request to MTS. The form certifies that all subcontractors and lower-tier subcontractors were paid within thirty (30) calendar days of receiving payment from MTS for work performed during the previous month. The Contractor must submit the completed certification, as required on the form, and the month following final acceptance of the project.

7.23. RECORDS RETENTION AND ACCESS TO SITES OF PERFORMANCE

(a) Types of Records. Contractor and any Subcontractor shall retain, complete and make readily accessible records related in whole or in part to the performance of the Contract, including, but not limited to, data, documents, reports, statistics, subagreements, leases, third party contracts, arrangements, other third party agreements of any type, and supporting materials related to those records.
(b) Retention Period. The Contractor and any Subcontractor shall maintain all books, records, accounts and reports required under this Contract for a period of at not less than three (3) years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case records shall be maintained until the disposition of all such litigation, appeals, claims or exceptions related thereto.
(c) Access to Records and Sites of Performance. Contractor and any Subcontractor shall:
(1) Provide sufficient access to inspect, copy and audit records and information, related to the performance of the Contract, upon receipt of a request made by the U.S. Secretary of Transportation or the Secretary's duly authorized representatives, to the Comptroller General of the United States, the Comptroller General's duly authorized representatives, State of California or its duly authorized representatives, the California State Auditor, and/or MTS;

(2) Permit those individuals listed above access to all records of employment, employment advertisements, employment application forms, and other pertinent data related to the performance of the Contract;
(3) Permit those individuals listed above to have access to the sites of performance of the Contract and to make site visits as needed in compliance with the U.S. DOT Common Rules, as applicable.
(4) Otherwise comply with 49 U.S.C. § 5325(g), and federal access to records requirements as set forth in the U.S. DOT Common Rules, as applicable.

7.24. STANDARD OF PERFORMANCE

Contractor's services shall be performed in accordance with generally accepted professional practices and principles and in a manner consistent with the level of care and skill ordinarily exercised by members of Contractor's profession currently practicing under similar conditions. By delivery of completed work, Contractor certifies that the work conforms to the requirements of this contract and all applicable federal, state and local laws. If Contractor is retained to perform services requiring a license, certification, registration or other similar requirement under California law, Contractor shall maintain that license, certification, registration or other similar requirement throughout the term of this Contract.

7.25. COVENANT AGAINST CONTINGENT FEES

Contractor warrants that it has not employed or retained any company or person, other than a bona fide employee working for the Contractor, to solicit or secure this Agreement, and that she or he has not agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or formation of this Agreement. For breach or violation of this warranty, MTS shall have the right to annul this Agreement without liability or, at its discretion, to deduct from the Agreement a price or consideration, or otherwise recover the full amount of such fee, percentage, brokerage fee, gift, or contingent fee.

7.26. CALIFORNIA POLITICAL REFORM ACT

Contractor acknowledges that the California Political Reform Act ("Act"), Government Code section 81000 et seq., provides that Contractors hired by a public agency, such as MTS, may be deemed to be a "public official" subject to the Act if the Contractor advises MTS on decisions or actions to be taken by MTS. The Act requires such public officials to disqualify themselves from participating in any way in such decisions if they have any one of several specified "conflicts of interest" relating to the decision. To the extent the Act applies to Contractor, Contractor shall abide by the Act and the conflict of interest restrictions imposed on public officials by Government Code section 1090 et seq.

7.27. OWNERSHIP OF DOCUMENTS

Tracings, plans, specifications, and maps prepared or obtained under the terms of this Agreement shall be delivered to and become the property of MTS. Basic survey notes and sketches, charts, computations, and other data prepared or obtained under this Agreement shall be made available, upon request, to MTS without restriction or limitation on its use.

7.28. TIME

The Contractor acknowledges that timely performance is an important element of this Agreement. Accordingly, the Contractor shall consistent with the Standard of Performance set forth in Article 18 hereof, put forth its professional effort to complete its services in accordance with the agreed-upon schedule.

7.29. ENTIRE AGREEMENT

This Agreement is the entire agreement of the parties and no attempted modification shall be binding unless in writing and signed by MTS and the Contractor. All questions pertaining to the validity and interpretation of this Agreement shall be determined in accordance with the laws of California applicable to contracts made to be performed within the state.

7.30. CONTRACTOR AND SUBCONTRACTOR ASSURANCE

The Contractor and Subcontractor shall not discriminate on the basis of race, color, national origins, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as MTS deems appropriate, which may include but is not limited to: (1) Withholding monthly progress payments; (2) Assessing sanctions; (3) Liquidated damages; and/or (4) Disqualifying the contractor from future bidding as non-responsible. Each subcontract the Contractor signs with a Subcontractor must include the assurance in this paragraph.

7.31. DISPUTES, CLAIMS, AND RESOLUTION

MTS and the Contractor agree that every effort shall be made to resolve any dispute arising under this Agreement informally through their designated representatives. If the informal efforts are unsuccessful, then either party may request mediation by submitting a written request signed by an officer with the authority to bind the Contractor or MTS. Within five (5) business days of the request of any party, the parties shall mutually agree on the person or alternative dispute resolution agency to conduct the mediation. If the parties are unable to agree on the person or alternative dispute resolution agency to conduct the mediation, the initiating party may arrange for the office of the American Arbitration Association in downtown San Diego, California, to perform the mediation. The initiating party shall then schedule the mediation so that it is conducted within fifteen business days of the mediator's appointment. The costs of the mediation and fees of the mediator, if any, shall be borne by the requesting party. Any dispute not resolved through the mediation may proceed to litigation in a court of competent jurisdiction in the County of San Diego, State of California, unless the parties agree in writing to submit the dispute to binding arbitration.

Should the Contractor suffer any injury or damage to person or property because of any alleged act or omission of MTS, or if any of Contractor’s employees, agents, or others for whose acts the Contractor is legally liable suffers any injury or damages to person or property because of any alleged act or omission of MTS, a written claim for damages shall be filed with the MTS Office of General Counsel in accordance with the provisions of California Government Code section 900 et seq.

The duties and obligations imposed by this Agreement and the rights and remedies available hereunder shall be in addition to and not a limitation of any duties, obligations, rights, and

remedies otherwise imposed or available by law. No action or failure to act by MTS or Contractor shall constitute a waiver of any right or duty afforded any of them under this Agreement, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder except as may be specifically agreed to in writing.

7.32. DUTY TO CLARIFY OBVIOUS AMBIGUITY

The Contractor is required to seek clarification of any obvious ambiguity contained in the contract documents. Failure to do so will result in an interpretation of the ambiguous provision favorable to MTS should a dispute later arise concerning that provision.

7.33. PREVAILING WAGE

A. Prevailing Wage Rates.

Contractor is aware of the requirements of California Labor Code sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq. ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. If the services are being performed as part of an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and if the total compensation is $1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws, if applicable. Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this Agreement from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at www.dir.ca.gov. In the alternative, the Contractor may view a copy of the prevailing rate of per diem wages which are on file at MTS's Administration Office and shall be made available to interested parties upon request. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification, or type of worker needed to perform work on the project available to interested parties upon request, and shall post copies at the Contractor's principal place of business and at the Project site. Contractor shall defend, indemnify and hold MTS, it's Board, members of the Board, employees and authorized volunteers free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure to comply with the Prevailing Wage Laws.

The Contractor shall forfeit as a penalty to MTS not more than Two Hundred Dollars ($200.00), pursuant to Labor Code Section 1775, for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rate as determined by the Director of the Department of Industrial Relations for such work or craft in which such worker is employed for any public work done under the Contract by it or by any subcontractor under it. The difference between such prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof, for which each worker was paid less than the prevailing wage rate, shall be paid to each worker by the Contractor.

Contractor shall post, at appropriate conspicuous points on the project site, a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned.

If the Services involve federal funds or otherwise require compliance with the Davis-Bacon Fair Labor Standards Act, Contractor and all its subcontractors shall pay the higher of the state or federal prevailing wage rates.

B. Payroll Records.

Pursuant to Labor Code Section 1776, Contractor and all subcontractors shall maintain weekly certified payroll records, showing the names, addresses, Social Security numbers, work classifications, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by them in connection with the Services subject to the Prevailing Wage Laws. Contractor shall certify under penalty of perjury that records maintained and submitted by Contractor are true and accurate. Contractor shall also require subcontractor(s) to certify weekly payroll records under penalty of perjury.

In accordance with Labor Code section 1771.4, the Contractor and each subcontractor shall furnish the certified payroll records directly to the Department of Industrial Relations ("DIR") on the specified interval and format prescribed by the DIR, which may include electronic submission. Contractor shall comply with all requirements and regulations from the DIR relating to labor compliance monitoring and enforcement.

In the event of noncompliance with the requirements of this Section, the Contractor shall have ten (10) calendar days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this section. Should noncompliance still be evident after such 10-day period, the Contractor shall pay a penalty of one hundred dollars ($100.00) to MTS for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from progress payment then due.

C. California Department of Industrial Relations Registration.

Pursuant to Labor Code sections 1725.5 and 1771.1, the Contractor and all subcontractors must be registered with the Department of Industrial Relations ("DIR"). Contractor shall maintain registration for the duration of the Agreement and require the same of any subcontractors. This Agreement may also be subject to compliance monitoring and enforcement by the Department of Industrial Relations. It shall be Contractor's sole responsibility to comply with all applicable registration and labor compliance requirements, including the submission of payroll records directly to the DIR.

D. Labor Certification.

By its signature hereunder, Contractor certifies that it is aware of the provisions of section 3700 of the California Labor Code which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of that Code, and agrees to comply with such provisions before commencing the performance of the Services.

7.34. ROYALTIES AND PATENT FEES

The Contractor shall pay all royalties and patent fees, and shall defend all suits and claims for infringements of any patent rights, and shall hold MTS harmless from loss on account thereof. If however, the Contractor has information that the procedures or articles specified are an infringement of a patent, the Contractor shall be responsible for any loss unless said information is promptly given to MTS by Contractor.

7.35. PATENT RIGHTS

A. General.

If any invention, improvement, or discovery of MTS, or any of its third-party contractors, is conceived or first actually reduced to practice in the course of, or under this Project, and that invention, improvement, or discovery is patentable under the laws of the United States of America or any foreign country, MTS is required to notify FTA immediately and provide a detailed report.

B. Federal Rights.

Unless the Federal Government later makes a contrary determination in writing, the rights and responsibilities of MTS, third party contractor, subrecipient and the Federal Government pertaining to that invention, improvement, or discovery will be determined in accordance with applicable federal laws, regulations, including any waiver thereof. Unless the Federal Government later makes a contrary determination in writing, MTS, irrespective of its status or the status of any subrecipient or any third party contractor at any tier (i.e., a large business, small business, state government or state instrumentality, local government, nonprofit organization, institution of higher education, individual, etc.), MTS shall transmit to FTA those rights due the Federal Government in any invention resulting from that third party contract described in U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business firms Under Government Grants, Contracts, and cooperative Agreements," 37 C.F.R. Part 401.

7.36. RIGHTS IN DATA AND COPYRIGHTS

A. Definition.

The term "subject data" used in this section means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under the Grant Agreement or Cooperative Agreement. Examples include, but are not limited to: computer software, engineering drawings and associated lists; specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. The term "subject data" does not include financial reports, cost analyses, and similar information incidental to Project administration.

B. Federal Restrictions. The following restrictions apply to all subject data first produced in the performance of the Grant Agreement or Cooperative Agreement:

1. Except for its own internal use, Contractor may not publish or reproduce subject data in whole or in part, or in any manner or form, nor may Contractor authorize others to do so, without the written consent of the Federal Government, until such

time as the Federal Government may have either released or approved the release of such data to the public.

2. This restriction on publication, however does not apply to an Agreement with an institution of higher learning.

C. Federal Rights in Data and Copyrights. In accordance with 49 C.F.R. § 19.34 and 49 C.F.R. § 19.36, the Federal Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, for Federal Government purposes the "subject data" described in the following subsection 1 and 2. As used in the previous sentence, "for Federal Government purposes," means use only for the direct purposes of the Federal Government. Without the copyright's owner's consent, the Federal Government may not extend its federal license to other parties.

1. Any subject data developed in the Grant Agreement or Cooperative Agreement, or under a third-party contract or sub agreement financed by the Grant Agreement or Cooperative Agreement, whether or not a copyright has been obtained; and

2. Any rights of copyright to which MTS, a subrecipient or third party contractor purchases ownership with federal assistance.

D. Special Federal Rights for Planning, Research, and Development Projects. When FTA provides financial assistance for a planning, research, development or a Demonstration Project, it is FTA's general intention to increase transportation knowledge, rather than limit the benefits of the Project to participants in the Project. Therefore, unless FTA determines otherwise, the Recipient of FTA financial assistance to support a planning, research, development, or a Demonstration Project agrees that in addition to the rights in data and copyrights of Subsection C of this Section, FTA may make available to any FTA recipient, subrecipient, third party contractor, or third party subcontractor, either FTA's license in the copyright to the subject data derived under the Grant Agreement or Cooperative Agreement, or a copy of the subject data first produced under the Grant Agreement or Cooperative Agreement. If the Project, which is the subject of the Grant Agreement or Cooperative Agreement, is not completed for any reason whatsoever, all data developed under that Project shall become subject data as defined in Subsection A of this Section and shall be delivered as the Federal Government may direct. This Subsection D of this Section, however, does not apply to adaptations of automatic data processing equipment or programs for MTS' use whose costs are financed with Federal transportation funds for capital projects.

E. Hold Harmless. Unless prohibited by state law, upon request by the Federal Government, Contractor agrees to indemnify, save, and hold harmless MTS, the Federal Government and its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by the Contractor of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under this project, the Grant Agreement or Cooperative Agreement. Contractor shall not be required to indemnify the Federal Government for any such liability arising out of the wrongful acts of employees or agents of Federal Government.

F. Restrictions on Access to Patent Rights. Nothing contained in this section on rights in data, shall imply a license to the Federal Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Federal Government under any patent.

G. Application to Materials Incorporated into Project. The requirements of Sub-sections B, C and D of this Section, do not apply to material furnished by Contractor, and incorporated into the work carried out under this project, the Grant Agreement or Cooperative Agreement, provided that Contractor identifies the incorporated material at the time of delivery of the work.

7.37. ACCESS REQUIREMENTS FOR PERSONS WITH DISABILITIES

The Contractor shall comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. §§ 12101 et seq.; section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794; 49 U.S.C. § 5301(d); and the following federal regulations including any amendments thereto:

A. U.S. DOT regulations, "Transportation Services for Individuals with Disabilities (ADA)," 49 C.F.R. Part 37;

B. U.S. DOT regulations, "Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance," 49 C.F.R. Part 27;

C. U.S. DOT regulations, "Americans with Disabilities (ADA) Accessibility Specifications for Transportation Vehicles," 49 C.F.R. Part 38;

D. U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability in State and Local Government Services," 28 C.F.R. Part 35;

E. U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities," 28 C.F.R. Part 36;

F. U.S. GSA regulations, "Accommodations for the Physically Handicapped," 41 C.F.R. Subpart 101-19;

G. U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630;

H. U.S. Federal Communications Commission regulations, "Telecommunications Relay Services and Related Customer Premises Equipment for the Hearing and Speech Disabled," 47 C.F.R. Part 64, Subpart F;

I. FTA Regulations, "Transportation for Elderly and Handicapped Persons," 49 C.F.R. Part 609; and

J. Any implementing requirements FTA may issue.

7.38. METRIC SYSTEM

As required by U.S. DOT or FTA, Contractor agrees to use the metric system of measurement in its Project activities, in accordance with the Metric Conversion Act, as amended by the Omnibus Trade and Competitiveness Act, 15 U.S.C. §§ 205a *et seq*.; Executive Order No. 12770, “Metric

Usage in Federal Government Programs," 15 U.S.C. §§ 205a note; and any U.S. DOT or FTA regulations, guidelines, and policies. To the extent practicable and feasible, Contractor agrees to accept products and services with dimensions expressed in the metric system of measurement.

7.39. SUBSTANCE ABUSE

Pursuant to the rules and regulations of the Department of Transportation, Contractor will be required to comply with all applicable drug and alcohol testing requirements, including the amendments to 49 C.F.R. parts 655.

As a condition of this Contract, the following are the Contractor's Drug and Alcohol Testing Obligations:

A. Contractors Certification: Contractor certifies that it will comply with all applicable drug and alcohol testing requirements provided by law, including, but not limited to, the drug and alcohol testing requirements set forth in the Department of Transportation's regulations.

B. Indemnification of MTS: Contractor agrees to indemnify, defend and hold harmless MTS, SDTI and SDTC, and their directors, employees and agents from and against any loss, damage, expense and liability that MTS, SDTI or SDTC, may incur as a result of Contractor's failure to comply with any applicable drug and alcohol testing obligations.

C. Survival of MTS' Indemnification Rights: The rights and obligations contained in "B" (Indemnification of MTS) will survive any termination or expiration of this Agreement.

D. Failure to comply with Drug and Alcohol Testing Obligations May Result in Termination of Contract: If, at any time during the period of this Agreement, Contractor fails to comply with any applicable drug and alcohol testing requirements, MTS will consider such failure a material breach of this Agreement, and MTS may terminate this Agreement immediately.

7.40. IDENTIFICATION OF PERSONNEL/SECURITY

MTS shall provide all Contractor personnel assigned to work under this Agreement with Contractor Identification Badges ("MTS ID Card"). Requests for MTS ID Cards will be made to and processed by the MTS-designated project manager or contracting officer. Approved requests for MTS ID Card(s) will be processed within two business days. All Contractor personnel must obtain MTS ID Cards prior to entering MTS property. Valid MTS ID Cards must be displayed prominently on the uniform of all of Contractor's employees while on MTS property. Contractors are required to provide their employees uniforms prominently bearing the name of the Contractor's business entity. MTS will allow only properly credentialed personnel of the Contractor who are wearing the appropriate uniform on its property. Contractor personnel who enter MTS property without valid MTS ID Cards may be arrested and/or cited by MTS Code Enforcement and/or other law enforcement for trespassing and violation of MTS Ordinance 13. Contractor must collect MTS ID Cards from all Contractor personnel separating from employment with the Contractor and return them to MTS for destruction. Contractor is strictly liable for the use of all MTS ID Cards issued to its employees under this Agreement.

7.41. REQUIRED BACKROUND CHECKS

MTS requires that all Contractor personnel assigned to work on MTS property pass comprehensive background checks (Investigative Consumer Report), conducted by the

Contractor, prior to beginning work on MTS property or under this Agreement. At a minimum, the background check must, (1) positively establish the employee's identity, (2) search all common databases for criminal offenses (e.g., Federal District Court Databases), (3) verify the social security number or tax ID provided by the employee, (4) search sex offender databases, and (5) search the local criminal databases of every County in which the employee has lived in the last seven years. Contractor must conduct background checks in accordance with applicable law, including but not limited to, the Fair Credit Reporting Act and California Civil Code Sections 1785 and 1786.

Contractor personnel meeting any of the conviction criteria outlined below **are not eligible** for issuance of an MTS ID Card and may not be assigned to work on MTS property:

Permanent Disqualification:

1. Registered sex offenders are ineligible.
2. Espionage or conspiracy to commit espionage.
3. Sedition or conspiracy to commit sedition.
4. Treason or conspiracy to commit treason.
5. A federal crime of terrorism as defined in 18 U.S.C. 2332b(g), or comparable State law, or conspiracy to commit such crime.
6. A crime involving a TSI (transportation security incident). Note: A transportation security incident is a security incident resulting in a significant loss of life, environmental damage, transportation system disruption, or economic disruption in a particular area, as defined in 46 U.S.C. 70101. The term "economic disruption" does not include a work stoppage or other employee-related action not related to terrorism and resulting from an employer-employee dispute.
7. Improper transportation of a hazardous material under 49 U.S.C. 5124 or a comparable state law.
8. Unlawful possession, use, sale, distribution, manufacture, purchase, receipt, transfer, shipping, transporting, import, export, storage of, or dealing in an explosive or explosive device. An explosive or explosive device includes an explosive or explosive material as defined in 18 U.S.C. 232(5), 841(c) through 841(f), and 844(j); and a destructive device, as defined in 18 U.S.C. 921(a)(4) and 26 U.S.C. 5845(f).
9. Murder.
10. Threat or maliciously conveying false information knowing the same to be false, concerning the deliverance, placement, or detonation of an explosive or other lethal device in or against a place of public use, a state or government facility, a public transportations system, or an infrastructure facility.
11. Violations of the Racketeer Influenced and Corrupt Organizations Act, 18 U.S.C. 1961, et seq., or a comparable State law, where one of the predicate acts found by a jury or admitted by the defendant, consists of one of the permanently disqualifying crimes.
12. Attempt to commit the crimes in items (2)-(5) of this section.
13. Conspiracy or attempt to commit the crimes in items (6)-(11) of this section.
14. Any offense that is still pending in the courts (without official legal disposition) that will disqualify the individual if they are convicted.

Disqualification for seven years from the date of the offense or five years from the date of release from prison for the offense (whichever is later):

Unlawful possession, use, sale, manufacture, purchase, distribution, receipt, transfer, shipping, transporting, delivery, import, export of, or dealing in a firearm or other weapon. A firearm or other weapon includes, but is not limited to, firearms as defined in 18 U.S.C. 921(a)(3) or 26 U.S.C. 5 845(a), or items contained on the U.S. Munitions Import List at 27 CFR 447.21.

1. Extortion.
2. Dishonesty, fraud, or misrepresentation, including identity fraud and money laundering, where the money laundering is related to a crime listed in Parts A or B (except welfare fraud and passing bad checks).
3. Bribery.
4. Smuggling.
5. Immigration violations.
6. Distribution, possession w/ intent to distribute, or importation of a controlled substance.
7. Arson.
8. Kidnapping or hostage taking.
9. Rape or aggravated sexual abuse.
10. Assault with intent to kill.
11. Robbery.
12. Fraudulent entry into a seaport as described in 18 U.S.C. 1036, or a comparable State law.
13. Violations of the Racketeer Influenced and Corrupt Organizations Act under 18 U.S.C. 1961, et seq., or a comparable state law, other than any permanently disqualifying offenses.
14. Voluntary manslaughter.
15. Conspiracy or attempt to commit crimes in this section.
16. Any offense that is still pending in the courts (without official legal disposition) that will disqualify the individual if they are convicted.

The term conviction includes being found guilty, pleading guilty, pleading no contest, or being found guilty by reason of insanity.

This section sets forth minimum standards Contractors must uphold through their background checking process, when assigning employees to work on an MTS contract. These disqualifying criteria are minimum standards to promote public safety/security. Contractor may choose to exceed these standards and is otherwise unrestricted in its employment decisions. Contractor may choose to employ individuals who do not meet these standards, as long as they are not assigned to work under this Agreement or on MTS property. Questions regarding the application of MTS's background checking standards should be directed to the MTS Manager of Human Resources.

Upon request of MTS, Contractor will provide sufficient documentation for MTS to audit Contractor's compliance with MTS's background checking standards. MTS reserves the right to delay provision of MTS ID Cards until contractor documents completion of appropriate background checks on employee(s) for whom Contractor is requesting MTS ID Card(s). MTS's oversight of Contractor's background checking process is not intended to replace Contractors judgement or ability to manage its workforce and operation. MTS's oversight, or lack thereof, shall not limit Contractor's liabilities and/or obligations as set forth in this Agreement.

MTS reserves the right to suspend or revoke the MTS ID Cards of Contractor's employees at its sole and absolute discretion.

If, with MTS's consent, Contractor subcontracts all or part of the services within this Agreement, Contractor will remain directly responsible and liable for ensuring subcontractor(s) adhere to MTS background checking and ID Card standards.

If MTS determines that Contractor has breached its obligations as defined in this section, MTS may immediately terminate this Agreement by providing written notice to Contractor. If this Agreement is terminated, Contractor will be paid its costs for work performed up to the time of termination.

7.42. NONWAIVER

Failure of MTS to insist upon strict performance of any of the terms and conditions hereof, or failure or delay to exercise any rights or remedies provided herein, or by law, or to properly notify Contractor in the event of breach, or the acceptance of payment for any goods hereunder, or review of design, shall not release Contractor from any of the warranties or obligations of this agreement, and shall not be deemed a waiver of any right of MTS to insist regardless when shipped, received, or accepted or as to any prior or subsequent default hereunder, nor shall any revision of this agreement by MTS operate as a waiver of any of the terms hereof. A requirement that a Contractor's document be submitted for or subject to "authorization to proceed," "approval," "acceptance," "review," "comment," or combinations of such words or words of like import shall mean, unless the context clearly indicates otherwise, that Contractor shall, before implementing the information in the document, submit the document, obtain resolution of any comments, and obtain written authorization from MTS to proceed, and shall mean that a complete check will be performed. Authorization to proceed shall not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by Contractor and shall not relieve Contractor from full compliance with contractual obligations.

7.43. WATER QUALITY MANAGEMENT AND COMPLIANCE

To the extent that Consultant's services can impact storm water, the following shall apply:

A. Storm Water Management. Storm, surface, nuisance, or other waters may be encountered at various times during the Services. Contractor hereby acknowledges that it has investigated the risk arising from such waters, and assumes any and all risks and liabilities arising therefrom.

B. Compliance with Water Quality Laws, Ordinances and Regulations. Contractor shall keep itself and all subcontractors, staff, and employees fully informed of and in compliance with all local, state and federal laws, rules and regulations that may impact, or be implicated by the performance of the Services including, without limitation, all applicable provisions of the Federal Water Pollution Control Act (33 U.S.C. § 1251, et seq.); the California Porter-Cologne Water Quality Control Act (Water Code § 13000 et seq.); and any and all regulations, policies, or permits issued pursuant to any such authority. Contractor shall additionally comply with the lawful requirements of any other municipality, drainage district, or other local agency with jurisdiction over the location where the Services are to be conducted, regulating water quality and storm water discharges and shall implement best management practices, consistent with California Stormwater Quality Association standards, appropriate for the control of discharges related to the Services.

C. Standard of Care. Contractor warrants that all employees and subcontractors shall have sufficient skill and experience to perform the work assigned to them without impacting water quality in violation of the laws, regulations and policies described in this Section. Contractor further warrants that it, its employees and subcontractors have or will receive adequate training, as determined by MTS, regarding these requirements as they may relate to the Services.

7.44. ROADWAY WORKERS PROTECTION TRAINING

Prior to entering the MTS railroad operating corridor, all workers of Contractor, sub-Contractors, and any other (4) hour "Roadway Workers Protection" training course as required by the Federal Railroad Administration (FRA) California Public Utilities Commission (CPUC). Training courses are valid for one year from date issued. Contractor should allow at least two weeks to schedule training prior to commencement of services on the right of way (ROW).

Registration for the course can be found online at:
http://www.sdmts.com/Business/RAILSAFETYTRAINING.htm.

Any costs related to RWP training courses shall be at the sole expense of the Contractor and MTS shall at no time be responsible for reimbursement of said costs.

7.45. FLAGGING

Any work within fifteen (15) feet of active rail, or as otherwise identified by MTS, shall require an MTS flagger.

An MTS Flagger Request form must be submitted to FlagRequest@sdmts.com no later than 72 hours prior to the commencement of the work. The MTS Flagger Request shall include: the specific location, time(s) and date(s) for when a MTS flagger(s) will be necessary.

A. The MTS Flagger will be provided at the expense of the party requesting the work. The requester will be responsible to contact SDTI Assignment Office at 619.595.4956 no later than 24 hours prior to beginning of work for all cancellations and may be subject to SDTI labor reporting costs.

7.46 STATE RESTRICTIONS ON CAMPAIGN CONTRIBUTIONS

California Government Code section 84308 (also known as the "Levine Act") requires (a) disclosure of certain campaign contributions from Proposer or its agents to MTS Board Members; and (b) disqualification of those Board Members from participating in an MTS decision related to this procurement if the campaign contribution(s) meets the criteria set forth in the Levine Act. This procurement includes a CAMPAIGN CONTRIBUTION DISCLOSURE FORM that must be completed and submitted with the proposal. MTS reserves the right to request an update of the form during the applicable Levine Act compliance periods..

EXHIBIT D
FORMS

CONTACT INFORMATION

Read attached General Provisions carefully. They are a part of your proposal. Unit prices will prevail regardless of extensions submitted by the Respondent.

RETURN THIS FORM WITH YOUR PROPOSAL

Company Information:

The Official, Legal Name of Proposing Firm: Accenture Infrastructure and Capital Projects, LLC

Doing Business As:

Legal Structure (Corp./Partner/Proprietor): Limited Liability Company

Company Mailing Address: 12680 High Bluff Drive
Street

San Diego, CA 92130
City State Zip

Person Authorized to sign:

Point of Contact: Tyson Atwood, PE

Title: Senior Vice President

E-Mail Address: tyson.atwood@accenture.com

Phone Number: 805-459-7697

Accounts Receivable

Point of Contact: Trina McWilliams, CPA

Title: Assistant Corporate Controller

E-Mail Address: trina.mcwilliams@accenture.com

Phone Number: 407-743-2639

Labor Compliance

Point of Contact: Kathy Keating

Title: Director, Labor Compliance

E-Mail Address: kathryn.keating@accenture.com

Phone Number: 619-933-4952

MTS DBE PROGRAM - INFORMATION FOR BIDDER LIST AND COMMERCIAL USEFUL FUNCTION

MTS is required by Disadvantaged Business Enterprise (DBE) Regulations at 49 CFR Part 26 to collect and report data about DBE and non-DBE contractors and subcontractors who seek to work on MTS's projects. MTS may also use this data to set MTS's overall DBE goals and to assist in monitoring commercial useful function in order to count DBE participation toward meeting MTS's overall DBE goals.

INSTRUCTIONS: Each prime contractor and each subcontractor bidding/submitting a proposal is **required** to complete this form as part of their bid or proposal.

1. Firm Name:	Accenture Infrastructure and Capital Projects, LLC
2. Firm's Full Address (street, city, state, and zip code):	12680 High Bluff Drive San Diego, CA 92130
3. NAICS code for work seeking to perform:	541330, 541618, 541611
4. If applicable, please check any certification that your firm currently maintains:	❑ DBE ❑ SB – Small Business ❑ DVBE – Disabled Veteran Owned Business ❑ LGBTBE – LGBT Owned Business ❑ MBE – Minority Owned Business ❑ PDBE – Persons with Disability Owned Business ❑ WBE – Woman Owned Business
5. Only if DBE certified firm, please check one (1) type of work your firm is seeking to perform on this bid/proposal (as defined at enclosed MTS DBE Program: Commercial Useful Function – Guidance for DBE Contractors):	❑ Construction/Maintenance Services ❑ Professional Services ❑ Other Services – e.g. broker ❑ Manufacturer of Materials/Supplies ❑ Regular Dealer of Materials/Supplies ❑ Distributer of Materials/Supplies ❑ Other (not listed above) Material Supplier ❑ Trucking
6. Race of majority owner of firm:	Not Applicable
7. Gender of majority owner of firm:	Not Applicable
8. Year firm was established:	1996
9. Please check your firm's applicable annual gross receipt range:	❑ Less than $1,000,000 ❑ $1,000,0001 - $15,000,000 ❑ $15,000,001 - $30,720,000 ❑ $30,720,001 - $50,000,000 ☒ Greater than $50,000,000

SIGNATURE ACKNOWLEDGES AND AFFIRMS ACCURACY OF COMPLETED FORM

SUBCONTRACTOR (If multiple subcontractors, copy this form)	**PRIME CONTRACTOR**
RETURN THIS FORM WITH YOUR BID	
Signature: _____	Signature: Ty Atwood
Date: _____	Date: April 2, 2025

MTS DBE PROGRAM
Commercial Useful Function (CUF) – Guidance for DBE Contractors

Per FTA DBE Regulations at 49 CFR Part 26, to meet Commercial Useful Function requirements in order for MTS to count the participation of a DBE prime or DBE subcontractor towards its DBE Overall Goal, the **DBE prime or DBE subcontractor must**:

1) Be responsible for execution of the work of the contract and is carrying out its responsibilities by performing, managing, and supervising the work involved;
2) Not be an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation;
3) Perform or exercise responsibility for at least 30% of the total cost of its contract with its own work force; and
4) Depending on the type of work being performed, meet the definitions of the Table below.

Type of Work Performed	Definitions	Counting Rules of DBE Prime or DBE Subcontract Dollar Value
1a. Construction /Maintenance Services – Supplies purchased or leased equipment from a third-party	Responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (if applicable) and paying for the material itself	Count 100%
1b. Construction /Maintenance Services – Supplies purchased or leased equipment from a prime contractor		Count only labor costs (exclude cost of material, supplies, equipment purchased/leased from prime or its affiliates)
2a. Professional Services – Bona Fide Services	E.g. professional, technical, architectural and engineering, managerial, providing bonds, or insurance	Count 100%
2b. Services – Other	E.g. brokers, packagers, manufacturer's reps., (arrange or expedite the procurement of goods and services)	Count fees or commissions related to assistance only (exclude cost of service itself)
3a. Materials and Supplies – Manufacturer	Owns (or leases) and operates a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications. Manufacturing includes blending or modifying raw materials	Count 100%

Type of Work Performed	Definitions	Counting Rules of DBE Prime or DBE Subcontract Dollar Value
	RETURN THIS FORM WITH YOUR BID or assembling components to create the product to meet contract specifications. Not a manufacturer if only does minor modifications to materials.	
3b. Materials and Supplies – Regular Dealer	Owns (or leases) and operates, a store, warehouse or other establishment in which materials, supplies, articles or equipment of the "general character" required under the contract are bought, kept in sufficient quantities, and regularly sold or leased to the public in the usual course of business. Items kept and regularly sold by the DBE are of the ''general character'' when they share the same material characteristics and application as the items specified by the contract. Engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. At least 51% of the items on the contract are provided from its inventory, and when necessary, any minor quantities delivered from and by other sources are of the "general character" as those provided from the DBE's inventory. Both owns and operates distribution equipment used to deliver the products for bulk items (e.g. as petroleum products, steel, concrete or concrete products, gravel, stone, or asphalt) without owning, operating, or maintaining a place of business. Any supplementing of own distribution equipment must be by a long-term operating lease. Includes a supplier of items that are not typically stocked due to their unique characteristics (e.g. limited shelf life or items ordered to specification)	Count 60% of cost of materials or supplies (including transportation costs)
3c. Materials and Supplies – Distributor	Neither maintains sufficient inventory nor uses its own distribution equipment for the products in question. Engages in the regular sale or lease of items specified by the contract. Assumes responsibility for the items it purchases once they leave the point of origin (e.g. a manufacturer's facility) making it liable for any loss or damage not covered by the carrier's insurance	Count 40% of the cost of materials or supplies (including transportation costs)
3d. Materials and Supplies – Other	Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions	Count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site (exclude cost of

Type of Work Performed	Definitions	Counting Rules of DBE Prime or DBE Subcontract Dollar Value
	RETURN THIS FORM WITH YOUR BID	the materials and supplies themselves)
4a. Trucking – Owned and Operated	Responsible for management and supervision of entire trucking operation on the contract. Owns and operate at least 1 fully licensed, insured, and operational truck used on the contract, using drivers it employs.	Count credit for the total value of the transportation services provided on the contract.
4b. Trucking – Leased Trucks from another DBE firm	Owned and operates leased trucks from another DBE firm, including an owner-operator who is a DBE. Lease must indicate that the DBE has exclusive use of and control over the truck. Does not preclude the leased truck from working for others during the lease with the consent of the DBE, so long as lease gives the DBE absolute priority	Count credit for the total value of the transportation services the lessee provided on the contract.

CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER INELIGIBLE AND VOLUNTARY EXCLUSIONS LOWER THAN TIER COVERED TRANSACTIONS

RETURN THIS FORM WITH YOUR BID

CONTRACTOR AND SUBCONTRACTOR'S STATEMENT OF ELIGIBILITY

(Provide one completed Form for the Prime Contractor and any Subcontractors)

MTS may not permit a contractor or subcontractor to bid on, be awarded, or perform work on a public works project if the contractor or subcontractor is ineligible to bid on, be awarded or perform work on a public works project pursuant to California Labor Code sections 1777.1 or 1777.7.

In addition, MTS may not award any federally funded contract over $25,000 to a contractor or subcontractor that is excluded or disqualified pursuant to 2 CFR Part 180 Subpart C.

The prime/subcontractor certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification.

QUESTIONNAIRE

Has the Contractor, or any officer, principal, affiliates or employee of the Contractor ever been debarred, suspended, proposed for debarment, declared ineligible or otherwise prevented from bidding on, or completing a federal, state, or local government project?

☐ Yes

☒ No

If the answer is yes, or where the prime/subcontractor is unable to certify any of the statements in the above certifications, such prime/subcontractor shall attach an explanation (i.e. date, background, resolution) with this form.

Note: Failure to provide this form at the time of Bid/Proposal will not result in a finding of a non-responsive bid/proposal. Submittal of this form for The Prime Contractor and all Subcontractors is required for a Proposer to be deemed "Responsible." MTS encourages Proposers to complete and submit all forms at the time of bid/proposal.

SUBCONTRACTOR (Copy this form if needed for additional subcontractors)		PRIME CONTRACTOR	
Business Name:		Business Name:	Accenture Infrastructure and Capital Projects, LLC
License No. (if applicable):		License No. (if applicable):	N/A
DUNS No.:		DUNS No.:	137820580 (Accenture, LLP - parent company)

ACKNOWLEDGED AND AGREED

Print Name:		Print Name:	Tyson Atwood, PE
Title:		Title:	Senior Vice President
Signature:		Signature:	Ty Atwood
Date:		Date:	April 2, 2025

EQUAL OPPORTUNITY PROGRAM WORKFORCE REPORT

Metropolitan Transit System (MTS) enforces an Equal Opportunity (EEO) program established under MTS policies and procedures No. 25. This program prohibits discrimination in employment and requires MTS Contractors to be equal opportunity employers. You may submit a copy of the Employer Information Report, EEO-1, in lieu of the **Equal Opportunity Program Workforce Report Continued Form**. The undersigned hereby certifies that the foregoing data contained herein is true and correct:

COMPLETE ALL SECTIONS OF THIS FORM:

1. The Official, Legal Name of Proposing Firm: Accenture Infrastructure and Capital Projects, LLC
2. Doing Business As:
3. Legal Structure (Corp./Partner/Proprietor): Limited Liability Company
4. Address of Establishment in San Diego County: 12680 High Bluff Drive
   Street
   San Diego, CA 92130
   City State Zip
5. If there is no office in San Diego County, or if there are less than 15 employees in that office, include an address for your regional office that will oversee the work under MTS' contract:
   Street
   City State Zip

Employment Data - Include the employees located in San Diego County only, unless your firm employs fewer than fifteen (15) people locally. In the event, you should list the workforce of the regional office that will oversee the work under MTS' contract. Report all permanent full-time and part-time employees including apprentices and on-the-job trainees. Blank spaces will be considered as zeros

ACKNOWLEDGED AND AGREED

6. Name, Address, and Phone Number of Person to Contact Regarding this Report:

Name of Signee: Tyson Atwood, PE
Title: Senior Vice President
Phone Number
Address: 12680 High Bluff Drive
Street
San Diego, CA 92130
City State Zip
Name of Signee: Tyson Atwood, PE
Authorized Signature:
Date: April 2, 2025

EQUAL OPPORTUNITY PROGRAM WORKFORCE REPORT CONTINUED

OCCUPATIONAL CATEGORY	African American		Hispanic		Asian or Pacific Islander		Native American		Other		Overall Total	
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Executive/Managerial	0	0	0	0	0	0	0	0	4	1	4	1
Engineers/Architects/ Surveyors	0	0	0	0	0	0	0	0	0	1	0	1
Professionals (N.E.C.)	0	0	2	2	0	1	0	0	5	6	7	9
Technicians	0	0	1	0	0	0	0	0	2	0	3	0
Sales												
Administrative Support												
Protective Services												
Services (N.E.C.)												
Craft Workers (Skilled)												
Machine Operators, Assemblers & Inspectors												
Transportation and Material Moving												
Laborers (Unskilled)												
TOTALS FOR EACH COLUMN	0	0	3	2	0	1	0	0	11	8	14	11

Indicate by gender and ethnic code the number of the above workforce, which are persons with disabilities:

DISABLED												

ETHNIC IDENTIFICATION

African American: (NOT OF HISPANIC ORIGIN): All persons having origins in any of the black racial groups of Africa.
Hispanic: All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
Asian or Pacific Islander: Persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area, includes, China, Japan, Korea, the Philippine Islands, and Samoa.
Native American: All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition
Other: Caucasian and others not falling into one of the designated categories.
DISABLED DEFINITION
Any person who 1) has a physical or mental condition which limits one or more of such person's major life activities, 2) has a history of such a condition, or 3) is regarded as having such a condition. For purposes of this definition, "major life activity" means any mental or physical function or activity, which if impaired, creates a substantial barrier to employment.

OCCUPATIONAL CATEGORY LIST

Executive/Managerial
Executive, Management Related
Engineers/Architects/Surveyors
Professionals (N.E.C.) *
Mathematical and Computer Scientists
Natural Scientists
Health Diagnosing
Health Assessment and Treating
Teachers, Postsecondary
Teachers, except Postsecondary
Counselors, Educational and Vocational
Librarians, Archivists, Curators
Social Scientists and Urban Planners
Social, Recreation and Religious Workers
Lawyers and Judges
Writers, Artists Entertainers & Athletes
Technicians
Health Technologists and Technicians
Engineering and Related Technologists and Technicians
Science Technicians
Technicians, Except Health, Engineering, and Service
Sales
Supervisors and Proprietors
Sales Representatives, Finance, and Business Services
Sales Representatives, Commodities except Retail
Sales Workers, Retail, and Personal Services
Other Sales Related
Administrative Support
Supervisors of Administrative Support
Computer Equipment Operators
Secretaries, Stenographers, Typists
Information Clerks
Records Processing, Except Financial
Financial Records Processing
Duplicating and Other Office Machine Operators
Communications Equipment Operators
Mail and Message Distributing
Material Recording and Distributing Clerks
Adjusters and Investigators
Another Office/Clerical
*N.E.C.: Not Elsewhere Classified
Protective Services
Supervisors of Protective Services
Firefighting and Fire Prevention
Police and Detectives
Guards & Other Protective Services
Services (N.E.C.) *
Private Households
Food Preparation and Services
Health Services
Cleaning and Building Services
Personal Services
Craft Workers (Skilled)
Supervisors of Mechanics and Repairers
Vehicle and Mobile Equipment Mechanics and Repairers
Heating, Air Conditioning, Refrigeration, Mechanics
Other Mechanics and Repairers
Supervisors of Construction Trades
Construction Trades, Except Supervisors
Extractive Occupations
Precision Production Occupations
Machine Operators, Assemblers & Inspectors
Metalworking and Plastic Working Machine Operator
Metal and Plastic Processing Machine Operators
Woodworking Machine Operators
Printing Machine operators
Textile, Apparel, and furnishing Machine Operators
Machine Operators, Assorted Materials
Fabricators, Assembler and Hand Working Occupations
Production Inspector, Tester, Sampler, Weigher
Transportation and Material Moving
Motor Vehicle Operators
Rail Transportation Occupations
Water Transportation Occupations
Material Moving Equipment Operators
Laborers (Unskilled)
Handlers
Equipment Cleaners
Helpers & Laborers

CALIFORNIA PUBLIC RECORD ACT (CPRA) AKNOWLEDGEMENT

I/We hereby represent, acknowledge, and agree as follows:

1. MTS is a California public agency established by California Public Utilities Code, Section 120000. et. seq., and is subject to the California Public Records Act (Government Code sec. 6250 et seq.) which provides generally that all records relating to a public agency's business are open to public inspection unless exempted from disclosure by law.

2. The proposal I/we have submitted to MTS is open to public inspection under CPRA unless it is exempted from disclosure by law.

3. To the extent the proposal includes materials that I/we believe are exempt from disclosure under CPRA, I/we understand that I/we must provide a letter identifying the materials that I/we believe are exempt from disclosure and explaining the basis for exemption.

4. Any materials not identified as exempt from disclosure are open to public inspection, and I/we waive any right to subsequently claim exemption from disclosure for such materials.

5. MTS at all times retains the right to make the final determination regarding what, if any, portion of a proposal is subject to disclosure under CPRA.

6. Use of headers/footers bearing designations such as “confidential”, “proprietary”, or “trade secret” on all or nearly all of a proposal which would prohibit or limit public inspection is not acceptable and may deem the proposal non-responsive and may be rejected; labeling a page as such does not prohibit MTS from disclosing the page in response to a Public Records Act (PRA) response or in the ordinary cause of business if MTS concludes it is obligated to so by applicable law.

7. To defend and indemnify MTS in any action on a PRA request for any of the contents of a Proposal marked TRADE SECRET, CONFIDENTIAL or PROPRIETARY.

8. Marking a document as “confidential” or “proprietary” without the express written permission of MTS does not exempt a document from disclosure to third parties under state or federal law, or in the normal course of MTS’s business operations. MTS has no obligation to get a respondent’s permission before producing such documents.

9. The bid I/we have submitted *(check one of the following)* materials that we believe are exempt from disclosure under CPRA.

INCLUDES ☐

DOES NOT INCLUDE ☒

ACKNOWLEDGED AND AGREED

Company Name: Accenture Infrastructure and Capital Projects, LLC

Title: Tyson Atwood, Senior Vice President

Signature: Ty Atwood

Date: April 2, 2025

NONCOLLUSION DECLARATION

TO BE EXECUTED BY PROPOSER AND SUBMITTED WITH OFFER

(23 U.S.C. § 112(c) and California Public Contract Code § 7106)

RETURN THIS FORM WITH YOUR PROPOSAL

The undersigned declares:

I am the Senior Vice President of Accenture Infrastructure and Capital Projects, LLC, the party making the foregoing offer.

The offer is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The offer is genuine and not collusive or sham. The proposer has not directly or indirectly induced or solicited any other proposer to put in a false or sham offer. The proposer has not directly or indirectly colluded, conspired, connived, or agreed with any proposer or anyone else to put in a sham offer, or to refrain from submitting an offer. The proposer has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the offer price of the proposer or any other proposer, or to fix any overhead, profit, or cost element of the offer price, or of that of any other proposer. All statements contained in the offer are true. The proposer has not, directly or indirectly, submitted his or her offer price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, offer depository, or to any member or agent thereof, to effectuate a collusive or sham offer, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of the proposer that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the proposer.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on April 2, 2025 (date), at San Diego (city), California (state).

ACKNOWLEDGED AND AGREED

Name of Contractor: Accenture Infrastructure and Capital Projects, LLC

Signature: Ty Atwood

Date: April 2, 2025

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Section 2200 *et seq.*)

As required by California Public Contract Code Section 2204, the Contractor certifies subject to penalty for perjury that the option checked below relating to the Contractor's status in regard to the Iran Contracting Act of 2010 (Public Contract Code Section 2200 *et seq.*) is true and correct:

1. The Contractor is not:

   a. identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203; or

   b. a financial institution that extends, for 45 days or more, credit in the amount of $20,000,000 or more to any other person or entity identified on the current list of persons and entities engaging in investment activities in Iran prepared by the California Department of General Services in accordance with subdivision (b) of Public Contract Code Section 2203, if that person or entity uses or will use the credit to provide goods or services in the energy sector in Iran. ☒

2. MTS has exempted the Contractor from the requirements of the Iran Contracting Act of 2010 after making a public finding that, absent the exemption, MTS will be unable to obtain the goods and/or services to be provided pursuant to the Contract. ☐

3. The amount of the Contract payable to the Contractor for the Project does not exceed $1,000,000. ☐

Note: In accordance with Public Contract Code Section 2205, false certification of this form shall be reported to the California Attorney General and may result in civil penalties equal to the greater of $250,000 or twice the Contract amount, termination of the Contract and/or ineligibility to bid on contracts for three years.

ACKNOWLEDGED AND AGREED

Company Name: Accenture Infrastructure and Capital Projects, LLC

Title: Tyson Atwood, PE, Senior Vice President

Signature: Ty Atwood

Date: April 2, 2025

SAFETY DEPARTMENT STANDARD OPERATING PROCEDURES

FOR CONTRACTORS SAFETY AND HEALTH REQUIREMENTS

(SAF 016-03)

RETURN THIS FORM WITH YOUR PROPOSAL

January 2003

SAF 016-03

Purpose: To establish environmental, safety and health requirements for the San Diego Metropolitan Transit System (MTS) Contractors.

Background: MTS is committed in providing and maintaining a safe work place, safe plant and equipment, and a safe and competent workforce as required by legislation and best industrial practice for our employees, customers, visitors, and general public.

To support this commitment, we require our Contractors to provide adequate leadership and safety training for their employees and require the same of their sub-Contractors.

Objectives: This SOP requires all MTS Contractors to:

- Comply with the environmental, safety and health requirements of the contract as per FTA, OSHA, Cal OSHA, and San Diego Metropolitan Transit System (MTS).
- Assign a competent person the responsibility for the implementation of the safety regulations, personal protective equipment usage, and compliance with hazardous materials/environmental policies, and drug and alcohol program.
- Ensure that all Contractor employees and sub-Contractors are trained and educated in safety and support on-site Contractors on safe work and MTS safety programs.
- Sign the MTS Contractual Agreement with Outside Agencies (Safety Rules).

MTS Representatives are required to:

- Pro-actively monitor the Contractors' workplace to identify all occupational health and safety hazards – Departmental/Safety representative.
- Safety and contract requirements compliance – Audit/Inspection conducted and documented (schedule and spot check) by Quality Assurance Department.

NOTE: Copies of both MTS Illness and Injury Prevention Program (IIPP) and the MTS Maintenance Department Code of Safe Practices are available in the Safety Department's office. MTS handles the Engineering/Construction site safety plans.

SAFETY DEPARTMENT SAFETY RULES

MTS Contractual Agreement with Outside Agencies

Work on MTS Premises

RETURN THIS FORM WITH YOUR PROPOSAL

A. Safety Rules

These safety rules apply specifically to Contractors, Contractor's employees, or sub-Contractors working on Metropolitan Transit System (MTS) property. Any loss or damage, including death, resulting from Contractors, Contractor's employees, or subcontractor's negligence shall hold MTS management and employees harmless from any such loss. No work shall be performed on MTS property without approval and proper permits, when required. Requirements:

1. Comply with Cal OSHA, state, local and MTS' safety, and environmental policies.
2. Observe and follow all posted facilities safety regulations.
3. Use the proper Personal Protective Equipment required for the job.
4. No illegal drugs or alcohol will be consumed on site or off the premises while working for MTS.

B. Use of Tools and Equipment (when required)

1. Required Tools and Equipment must be in good condition, safe for use and calibrated (if required).
2. Follow safe engineering work practices/procedures.
3. Wear the required personal protective equipment when using tools.

C. Machinery and Vehicles (when required)

1. Do not attempt to operate MTS machinery or equipment without special permission.
2. Only licensed operators may operate Forklift Trucks and other equipment on MTS occupied spaces.

D. Contractor Requirements (when required)

1. Valid Contractor's license number.

ACKNOWLEDGED AND AGREED

Company Name:	Accenture Infrastructure and Capital Projects, LLC
Print Name:	Tyson Atwood, PE
Title:	Senior Vice President
Signature:	
Date:	April 2, 2025

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATE FORM

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to submit a proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See http://www.dir.ca.gov/Public-Works/PublicWorks.html for additional information.

No proposal will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Proposer hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations.

Bidder further acknowledges:

- Proposer shall maintain a current DIR registration for the duration of the project.
- Proposer shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.
- Failure to submit this form or comply with any of the above requirements may result in a finding that the proposal is non-responsive.

PRIME CONTRACTOR

Business Name:	Accenture Infrastructure and Capital Projects, LLC
Registration No. (if applicable):	2000009753
DUNS No.:	137820580 Accenture LLP (parent company)
Company Name:	Accenture Infrastructure and Capital Projects, LLC
Print Name:	Tyson Atwood, PE
Title:	Senior Vice President

CAMPAIGN CONTRIBUTION DISCLOSURE FORM AND INFORMATION SHEET

This form pertaining to campaign contributions must be completed by individuals and firms who may be awarded a license, permit, or other entitlement for use by the San Diego Metropolitan Transit System ("MTS") Board of Directors. License, permit or other entitlement for use is defined in Government Code Section 84308(a)(5). Section 84308 reads as follows:

A. The definitions set forth in this subdivision will govern the interpretation of this section.

(1) "Party" means any person who files an application for, or is the subject of, a proceeding involving a license, permit, or other entitlement for use.

(2) "Participant" means any person who is not a party but who actively supports or opposes a particular decision in a proceeding involving a license, permit, or other entitlement for use and who has a financial interest in the decision, as described in Article 1 (commencing with Section 87100) of Chapter 7. A person actively supports or opposes a particular decision in a proceeding if he or she lobbies in person the officers or employees of the agency, testifies in person before the agency, or otherwise acts to influence officers of the agency.

(3) "Agency" means an agency as defined in Section 82003 except that it does not include the courts or any agency in the judicial branch of government, local governmental agencies whose members are directly elected by the voters, the Legislature, the Board of Equalization, or constitutional officers. However, this section applies to any person who is a member of an exempted agency but is acting as a voting member of another agency.

(4) "Officer" means any elected or appointed officer of an agency, any alternate to an elected or appointed officer of an agency, and any candidate for elective office in an agency.

(5) "License, permit, or other entitlement for use" means all business, professional, trade and land use licenses and permits and all other entitlements for use, including all entitlements for land use, all contracts (other than competitively bid,[1] labor, or personal employment contracts), and all franchises.

(6) "Contribution" includes contributions to candidates and committees in federal, state, or local elections.

B. No officer of an agency will accept, solicit, or direct a contribution of more than $250 from any party, or his or her agent, or from any participant, or his or her agent, while a proceeding involving a license, permit, or other entitlement for use is pending before the agency and for three months following the date a final decision is rendered in the proceeding if the officer knows or has reason to know that the participant has a financial interest, as that term is used in Article 1 (commencing with Section 87100) of Chapter 7. This prohibition will apply regardless of whether the officer accepts, solicits, or directs the contribution for himself or herself, or on behalf of any other officer, or on behalf of any candidate for office or on behalf of any committee.

[1] Note that the FPPC has limited the "competitively bid" exception to low-bid contracts. Negotiated requests for proposals do not qualify as a "competitively bid" contract under this provision.

C. Prior to rendering any decision in a proceeding involving a license, permit or other entitlement for use pending before an agency, each officer of the agency who received a contribution within the preceding 12 months in an amount of more than $250 from a party or from any participant must disclose that fact on the record of the proceeding. No officer of an agency will make, participate in making, or in any way attempt to use his or her official position to influence the decision in a proceeding involving a license, permit, or other entitlement for use pending before the agency if the officer has willfully or knowingly received a contribution in an amount of more than $250 within the preceding 12 months from a party or his or her agent, or from any participant, or his or her agent if the officer knows or has reason to know that the participant has a financial interest in the decision, as that term is described with respect to public officials in Article 1 (commencing with Section 87100) of Chapter 7. If an officer receives a contribution which would otherwise require disqualification under this section, returns the contribution within 30 days from the time he or she knows, or should have known, about the contribution and the proceeding involving a license, permit, or other entitlement for use, he or she will be permitted to participate in the proceeding.

D. A party to a proceeding before an agency involving a license, permit, or other entitlement for use must disclose on the record of the proceeding any contribution in an amount of more than $250 made within the preceding 12 months by the party, or his or her agent, to any officer of the agency. No party, or his or her agent, to a proceeding involving a license, permit, or other entitlement for use pending before any agency and no participant, or his or her agent, in the proceeding will make a contribution of more than $250 to any officer of that agency during the proceeding and for three months following the date a final decision is rendered by the agency in the proceeding. When a closed corporation is a party to, or a participant in, a proceeding involving a license, permit, or other entitlement for use pending before an agency, the majority shareholder is subject to the disclosure and prohibition requirements specified in subdivisions (b), (c), and this subdivision.

E. Nothing in this section will be construed to imply that any contribution subject to being reported under this title will not be so reported." (See also Title 2, California Code of Regulations Sections 18438.1 - 18438.8)

The current MTS Board members are listed HERE.

For more information, contact the Fair Political Practices Commission, 428 J Street, Suite 800, Sacramento, California, 95814, (916) 322-5660.

NONE TO DISCLOSE

CAMPAIGN CONTRIBUTION DISCLOSURE FORM

COPY THIS FORM IF NEEDED FOR ADDITIONAL ENTIRES.

The current MTS Board members are listed HERE. BOARD MEMBERS ARE LISTED HERE.SAL

Firm Name: Accenture Infrastructure and Capital Projects, LLC

Address: 12680 High Bluff Drive
Street

San Diego CA 92130
City State Zip

Phone: 424-307-3756

Title of pending license, permit, or other entitlement for use (including a contract or amendment) that pertains to the Party in the manner described in Government Code Section 84308(a):

ON-CALL ARCHITECTURE AND ENGINEERING SERVICES

PWL425.0-25

Date of MTS Board meeting when the license, permit, or other entitlement for use (including contract or amendment) is scheduled for MTS Board consideration (for RFPs this will be an estimated date at the time the solicitation is published):

12/19/2024

Name(s) of MTS member(s) or officer(s) to whom the Proposer, a participant, or either's agent made campaign contributions aggregating more than $250 within the time period specified in Government Code Section 84308(b) or (c):

Disclosure Information	
Name of Board Member or Officer:	
Name of Contributor:	
Date(s):	
Amount:	

Disclosure Information	
Name of Board Member or Officer:	
Name of Contributor:	

NONE TO DISCLOSE

Date(s): _____

Amount: _____

RETURN THIS FORM WITH YOUR PROPOSAL

By signing below, I acknowledge that no contribution(s) aggregating more than $250 were made by the Consultant or its agents to an MTS Board Member or Officer within the time period specified in Government Code Section 84308(b) or (c).

ACKNOWLEDGED AND AGREED

Signature of Party and/or Party's Agent: Ty Atwood

Date: April 2, 2025

Tyson Atwood, PE
Senior Vice President

SAMPLE PROMPT PAYMENT CERTIFICATION FORM

SAN DIEGO METROPOLITAN TRANSIT SYSTEM
PROMPT PAYMENT CERTIFICATION FORM

PURPOSE: This certification is used to monitor compliance by prime contractors to promptly pay its subcontractors. In accordance with DOT's DBE Regulations and MTS's DBE Program, prime contractors must pay its subcontractors for satisfactory performance of their contracts no later than seven (7) days from receipt of payment from MTS. Any delay or postponement of payment over thirty (30) days must be for good cause and after receipt of prior written approval from a MTS Project Manager.

INSTRUCTIONS: Please complete the below Prompt Payment Certification Form and return to MTS within **14 days** after receipt of payment from MTS at the following email address: antonio.monreal@sdmts.com. If there is more than one subcontractor on the contract, please complete a separate Prompt Payment Certification Form for each subcontractor.

1. CONTRACTOR INFORMATION

Contractor Name: _____ Contract No. _____ Work Order No. _____

Telephone No. _____ Email Address _____

2. PAYMENT INFORMATION

a) Name of Subcontractor: _____

b) Type of Services or Materials Provided by Subcontractor (state NAICS code if known)

_____

c) Date Last Payment Received from MTS?

_____

d) Was any of that payment for services/materials provided by the subcontractor? If YES, please answer questions e-g. If NO, proceed to Part 3 Certification.

_____

e) When was the Subcontractor paid for the services/materials it provided? * Prime contractors must pay its subcontractors for satisfactory performance of their contracts no later than seven (7) days from receipt of payment from MTS*

_____

f) If payment was delayed or postponed over thirty (30) days, was the reason for good cause? (Explain) _____

_____

g) If payment was delayed or postponed over thirty (30) days, **who** at MTS pre-authorized the delay or postponement and **when** was such pre-authorization given? _____

_____

3. CERTIFICATION

The contractor hereby certifies that the foregoing Prompt Payment Certification Form is true and correct.

Signature _____ Title _____ Date _____

_____

***** FOR MTS USE ONLY *****

Date Certification Received _____ Contractor Compliant _____

Contract Administrator _____ Date Reviewed _____

EXHIBIT E
POLICY 44C TRAVEL GUIDELINES FOR CONTRACTORS

Metropolitan Transit System

Travel Guidelines Applicable to MTS Contractors No. 44-C

SUBJECT:

Travel Expense Guidelines Applicable to MTS Contractors

PURPOSE:

To provide travel expense guidelines for MTS Contractors in accordance with MTS policies.

GUIDLINE:

44.1 Contractors. This policy applies to all MTS Contractors and their subcontractors or authorized agents when travel expenses are stated as a line item with a prospective or current Contractors' quote, bid, proposal, or other offering. These guidelines are not intended to imply or authorize additional travel related not expressly authorized in a contract with MTS. The following expense guidelines apply to any requests for travel reimbursement submitted to MTS with a Contractor's invoice. All travel related expenses intended to be invoiced to MTS should have written approval or agreement with MTS prior to incurring such expenses.

44.2 Expense Report. Invoices including requests for travel reimbursement shall include an expense report for the travel expenses incurred and billed to MTS. All expenses should be itemized, including items the Contractor may have paid for in advance (e.g., airfare, or other travel expenses) so that the report provides a complete record of all expenses.

44.3 Receipts. Itemized receipts for expenditures must be attached to the Expense Report for all expenses where a receipt is practically attainable (mandatory, unless a written satisfactory explanation is provided for expenses in excess of $10). Such written explanations may be subject to review and approval of MTS. Hotel charges must be evidenced by an itemized hotel bill. A credit card receipt is not sufficient.

44.4 Expenditure Guidelines. The following expenditure guidelines should be observed as upper limits unless particular circumstances reasonably dictate otherwise, and prior MTS approval is obtained:

a. Upper Limits. Upper limits for meals, hotels, and similar costs will be updated

annually (See Exhibit A, Annual Travel Cost Rates).

b. Air Travel. Air travel should be coach class for the most direct route. Travel arrangements should be made as far as possible in advance in order to secure the most favorable rates. MTS will cover the cost if it is more cost effective (i.e., difference in airfare as compared to the additional cost for hotel and meals) to include a Saturday stay. Contractors should consider option when practical. Refundable airfares may be purchased if warranted.

c. Personal Auto Use. In the event that a private auto is used for the trip, mileage will be paid in accordance with the current IRS Mileage Reimbursement Rates. Maximum reimbursement shall not exceed the cost of a comparable coach airfare to the same location.

d. Ground Transportation. In using surface transportation, the most practical, least expensive alternative should be utilized. Such transportation includes travel to and from the airport and reasonable business-related trips at the location. Contractors are encouraged to utilize public transportation where available.

1. Parking. MTS will reimburse the lesser of the parking cost for a personal auto left at the airport of the cost of a shuttle service taxi, or ride share service to and from the airport. If a specific option is not feasible given the time of travel or other personal circumstances, a waiver should be requested.

e. Rental Car. In the event a rental car is required, MTS will reimburse rental car charges for up to a reasonably priced standard-size sedan, unless the nature of the travel of contractors traveling warrants a larger vehicle. Contractor will be responsible for the cost difference, if any, for any vehicle upgrades over a standard-size sedan. MTS will not reimburse for rental car insurance coverage.

f. Meals (While in Travel Status). Meals, including tip, shall generally average no more than the maximum rate approved and published annually in Exhibit A. Alcohol consumed with a meal is not reimbursable, including applicable taxes and tips related to the alcohol cost. The amount per day applies to each 24-hour day of travel, and partial days would be prorated accordingly. Exceptions for the maximum rates must be approved by MTS.

g. Hotel. Contractors will be reimbursed for the cost of a reasonably priced single-occupancy hotel room. The maximum reimbursement is limited to the rate approved and published annually in Exhibit A. However, Contractors are not required to stay in unsafe locations or locations that would result in long commutes to their meetings simply to meet those limits. These maximum limits do not apply if the Contractor is staying at a hotel where a conference is being held. MTS may authorize a waiver of the maximum limits in the event (1) the conference hotel is fully booked and the Contractor stays at a nearby hotel with a rate reasonably comparable to the conference hotel rate; or (2) a safe and convenient hotel within the maximum rates is not identified within reasonable proximity to the meeting or event necessitating the business travel.

p. Cancellation Penalties. In the event that registration, airfare, hotel deposit, or any other such items that require prepayment are paid and the Contractor is

unable to attend and the prepayment is nonrefundable, then the Contractor may be responsible for reimbursing MTS for the full cost unless the inability to attend is for valid business reasons, medical conditions, or personal emergencies, as approved by MTS.

q. Non-allowable Expenses. MTS will not provide any reimbursement for personal entertainment expenses, alcoholic beverages, movies in hotels, personal items, charitable contributions, rental car or air travel insurance, travel expenses for family members (including but not limited to transportation, hotels, and meals), or any other expenses not deemed necessary for business purposes.

r. Political Events. MTS will not provide reimbursement for expenses incurred for the purpose of attending political events. An event shall be considered "political" if it is held for the purpose of supporting, opposing, or raising money to support or oppose any candidate, ballot measure, or political party.

s. Non-Discrimination. MTS will not provide any reimbursement for expenses incurred with any private club or establishment that discriminates on the basis of race, color, national origin, disability, gender, religion, sexual orientation, or other legally protected class in its membership policy.

Attachments: Exhibit A – Annual Travel Cost Rates

EXHIBIT A

ANNUAL TRAVEL COST RATES CALENDAR YEAR 2025

Hotel Maximum (quoted price – not including taxes or fees)

Small / Medium U.S. Cities	$200.00
Large U.S. Cities / International	$275.00

Average Daily Meal Maximum

All Localities	$90.00

Mileage Reimbursement Rate

As set by the IRS, effective January 1, 2025 per mile	$0.70

NOTES:

1. These are maximum rates. A higher cap may be obtained if pre-authorized by MTS. Rates must be reasonable and necessary under the circumstances and will customarily be lower.

2. Meal caps are detailed out below, with an overall daily cap of $90.00

   Breakfast - $30.00
   Lunch - $30.00
   Dinner - $50.00

3. If a conference registration fee covers meals, employees are to participate in those meals.

4. Small / Medium U.S. Cities are defined for this rate structure as those with less than 1 million persons in the metropolitan area.

   Large U.S. Cities are defined for this rate structure as those with more than 1 million persons in the metropolitan area.

5. The Mileage Rate is directly tied to the rate set by the IRS and will be revised more frequently than annually if done so by the IRS.

Exhibit A - Revised on 3/3/25

Metropolitan Transit System

Agenda Item No. 14

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

NetCloud License Renewal – Contract Award

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G3048.0-25 (in substantially the same format as Attachment A), with GovSmart Inc., for the NetCloud License Renewals through July 10, 2028, for a total of $682.876.92.

Budget Impact

The total cost of this contract is estimated to be $682.876.92, (Attachment B). This project will be funded by the Information Technology (IT) Operations Budget account 661010-571250.

DISCUSSION:

MTS operates buses, trolleys, and cars that require a cellular network connection for the onboard systems to communicate with the backend systems that operations use to manage the vehicles.

These cellular routers are Ericsson Cradlepoint models managed and deployed via the NetCloud cloud-based management system. They require an essential license for basic network functions and an additional advanced license for management through NetCloud. This system enables operations to configure, deploy, and track these routers remotely, enhancing efficiency by eliminating the need to visit each vehicle.

The scope of this purchase is to renew this licensing and support to make sure the routers will continue to provide networking for the vehicles and so MTS can continue to use the NetCloud system for management. The licensing and support will cover MTS buses, trolleys, and cars.

To streamline the procurement process for the long term, we determined that the most efficient approach would be to synchronize the expiration dates of all licenses to July 10, 2028. This way, future orders can be placed simultaneously. To achieve this for our current purchase request, we collaborated with Ericsson to receive credits for the remaining validity of our licenses, ensuring that the new expiration dates aligned with our goals while also maintaining cost-effectiveness.

On March 28, 2025, MTS issued an Invitation for Bids (IFB) to renew expiring NetCloud Licenses. On May 9, 2025, MTS received a total of thirteen (13) bids from the following:

Bidder Name	Certifications	Total Amount (non-taxable)
GovSmart Inc. *	N/A	$682,876.92
Axelliant LLC	MBE	$693,310.59
vCloud Tech Inc.	DBE	$693,310.32
Saitech Inc	MBE	$694,677.50
Alpine Technologies LLC	DBE	$697,179.10
Insight Public Sector Inc.	N/A	$704,863.16
vPrime Tech Inc.	N/A	$708,387.06
Compulink Technologies Inc.	N/A	$709,956.30
Kambrian Corp	DBE	$711,697.99
ROK Brothers Inc.	N/A	$718,593.76
GJH Inc	DBE	$725,506.28
CVH Networks LLC	N/A	$760,052.26
Questivity Inc.	DBE	$948,859.38
MTS Independent Cost Estimate (ICE)		$952,660.82

**Lowest responsive and responsible bidder*

MTS staff has deemed GovSmart to be the lowest responsive and responsible bidder and has determined their bid to be fair and reasonable based on the comparison of all bids received and MTS' ICE as shown above. The MTS' ICE is larger than the bids due to conservative assumptions of Consumer Price Index (CPI) increase.

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to execute MTS Doc. No. G3048.0-25 (In substantially the same format as Attachment A), with GovSmart Inc., for the NetCloud License Renewal for a total of $682.876.92.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachments: A. Draft Agreement G3048.0-25
B. GovSmart Quote G3048.0-25

Metropolitan Transit System

STANDARD AGREEMENT
FOR

MTS DOC. NO. G3048.0-25

NETCLOUD LICENSE RENEWALS

THIS AGREEMENT is entered into this _____ day of _____, 2025 in the State of California by and between San Diego Metropolitan Transit System ("MTS"), a California public agency, and the following, hereinafter referred to as "Contractor":

Name: GovSmart Inc.

Address: 715 Charlton Ave, Charlottesville VA 22903-5219

Form of Business: Corporation
(Corporation, Partnership, Sole Proprietor, etc.)

Email: sales@govsmart.com

Telephone: 434-326-5656

Authorized person to sign contracts Hamza Durrani (Name) CGO (Title)

The Contractor agrees to provide services as specified in the conformed Scope of Work/Minimum Technical Specification (Exhibit A), Contractor's Bid/Pricing Form (Exhibit B), and in accordance with the Standard Agreement, including Standard Conditions (Exhibit C), Forms (Exhibit D).

The contract term is for three (3) years effective August 1, 2025 through July 10, 2028. Payment terms shall be net 30 days from invoice date. The total cost of this contract shall not exceed $682,876.92 (non-taxable) without the express written consent of MTS.

SAN DIEGO METROPOLITAN TRANSIT SYSTEM	GOVSMART INC
By: _____ Sharon Cooney, Chief Executive Officer	By _____
Approved as to form: By: _____ Karen Landers, General Counsel	Title: _____

GovSmart®
Tax ID: 27-1553123 | SAM UEI: DJACUETFQUL8 | CAGE: 5WFZ8
715 Charlton Avenue | Suite 100 | Charlottesville, VA 22903
434.326.5656 | 434.326.5394 Fax | sales@govsmart.com
govsmart.com

Sales Quote

Customer	Ship To	Contract Information		Quote Information	
San Diego Metropolitan Transit System Derek Rodriguez	San Diego Metropolitan Transit System Derek Rodriguez	Type: Contract #: RFQ/RFI #: Ship Via: Lead Time:	OPEN MARKET OPEN MARKET G3048.0-25 E-Delivery 3 Days ARO	**Quote #:** Date: Expires: Salesperson: Phone: Email:	**GS2505012AF86** May 9, 2025 August 6, 2025 Sarah Lemley 434-208-1302 sarahlemley@govsmart.com

Line	Manufacturer Part Number	Manufacturer Name	Description	Qty	Unit Price	Extended Price
1	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 08/01/25 POP End Date 07/10/28	130	464.58	60,395.40
2	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 09/01/25 POP End Date 07/10/28	150	451.17	67,675.50
3	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 10/01/25 POP End Date 07/10/28	150	438.21	65,731.50
4	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 11/01/25 POP End Date 07/10/28	150	424.82	63,723.00
5	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 12/01/25 POP End Date 07/10/28	150	411.84	61,776.00
6	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 01/01/25 POP End Date 07/10/28	178	398.44	70,922.32
7	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 01/22/26 POP End Date 07/10/28	26	389.37	10,123.62
8	MA3-NCESS-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan POP Start Date 10/30/26 POP End Date 07/10/28	12	267.94	3,215.28
9	MA3-NCADV-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Advanced Plan (requires corresponding Essentials Plan) POP Start Date 01/22/26 POP End Date 07/10/28	930	257.76	239,716.80
10	MAA3-NCEA-R-2	CradlePoint Inc	3-yr Renewal NetCloud Mobile Essentials Plan and Advanced Plan POP Start Date 06/26/26 POP End Date 07/10/28	10	535.81	5,358.10
11	MBA1-NCEA-R-2	CradlePoint Inc	1-yr Renewal NetCloud Mobile Performance Essentials Plan and Advanced Plan POP Start Date 09/26/27 POP End Date 07/10/28	130	263.38	34,239.40

GovSmart®

Tax ID: 27-1553123 | SAM UEI: DJACUETFQUL8 | CAGE: 5WFZ8

715 Charlton Avenue | Suite 100 | Charlottesville, VA 22903
434.326.5656 | 434.326.5394 Fax | sales@govsmart.com

govsmart.com

Subtotal	**682,876.92**
Total Tax	0.00
Total $ Incl. Tax	**682,876.92**

TERMS AND CONDITIONS

GovSmart, Inc. maintains an active SAM.gov registration where all company representations and certifications are readily available, including FAR 52.204-26 Covered Telecommunications Equipment or Services.
Unless otherwise specified within this quote or agreed to by in writing, full payment for order is due within 30 days of invoice date.
Ordering only part of this quote may change the pricing, and a new quote may be required. Contact your sales representative to confirm.
This order may include software subject to a manufacturer's User Agreement or End User License Agreement. Please review the applicable UA or EULA to ensure it is acceptable prior to ordering the software.
Delivery dates on all orders are subject to manufacturer availability. If this is a DPAS-rated order not specified as such on the solicitation, please request delivery notification from your sales representative prior to placing the order.
This quote may include items shipped from different manufacturers or locations that may arrive at different times. In the event of a partial delivery, please provide written authorization, as part of the order, for GovSmart to submit partial invoices for partial deliveries.
Returns: Special/custom built product sales are final and cannot be returned or exchanged. Commercial-off-the-shelf (COTS) items are subject to the manufacturer's standard return policy which can be accessed through the manufacturer's website. Per DODI 5200.48, para. 3.10(b), do not send CUI/FPI to GovSmart using @govsmart.com email addresses. Please contact GovSmart for instructions for securely transmitting CUI/FPI. Invoices not paid within terms are subject to a 1.5% per month interest charge.
Renewal of expired subscription licenses require a 10% reinstatement fee.

Metropolitan Transit System

Agenda Item No. 15

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

S7 Replacement Design: 12th and Imperial and Blue Line Project – Funds Transfer

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the transfer of Transportation Development Act (TDA) funding in the amount of $2,500,000.00 from the Wheel Sensor Device (WSD) & SICAS S7 Replacement: Broadway Wye and India Crossover Project (CIP 2005114501) to the S7 Replacement Design: 12th and Imperial and Blue Line Project (CIP 2005118801).

Budget Impact

There would be no change to the overall Capital Improvement Program (CIP) amount.

This transfer will add $2,500,000 to the already approved budget of $1,300,000 funded in previous years' CIPs to continue funding the S7 Replacement Design: 12th and Imperial and Blue Line project (CIP 2005118801).

The WSD & SICAS S7 Replacement: Broadway Wye and India Crossover project (CIP 2005114501) budget of $4,965,000.00 million will be reduced by $2,500,000, but the remaining $2,465,000.00 from TDA funds will remain within the project for completing construction, construction management services, and design services during construction.

The WSD & SICAS S7 Replacement: Broadway Wye and India Crossover project has been fully funded to date, while the S7 Replacement Design: 12th and Imperial and Blue Line project will be fully funded in a future Fiscal Year (FY) CIP.

DISCUSSION:

San Diego Trolley Inc. (SDTI) trolleys use a signaling system along the trolley network to maintain predictable scheduling and to ensure that trolleys are operated safely to avoid train collisions and derailments per Federal Railroad Administration and California Public Utilities Commission requirements. The SICAS S7 signaling system was installed on the SDTI system as a part of the 2013 Trolley Renewal program at the Broadway, C Street, and Blue Line

South. Siemens Technology is the original equipment manufacturer for the SICAS S7 signaling system and the system is considered proprietary signaling equipment of Siemens. The SICAS S7 system became obsolete in or about October 2020. Therefore, Siemens no longer manufactures or supports the SICAS S7 signaling program with replacement parts. A replacement of the SICAS S7 system is an important component of MTS's CIP. CIP projects to address this state of good repair need have been divided based on their physical location on the track.

During the CIP approval process, certain funds were put in the wrong portion of the overall SICAS S7 replacement project. Today's proposed action would re-allocate the funds to the correct CIP projects.

During the FY 25 CIP, MTS programmed $2 million of TDA funding to the WSD & SICAS S7 Replacement: Broadway Wye and India Crossover project, that was intended to have been allocated to the S7 Replacement Design: 12th and Imperial and Blue Line Project. As explained below, both projects had previously been assigned similar project names with similar scopes of work. Additionally, after completing design services and having received and accepted bids for construction and construction management services for the WSD & SICAS S7 Replacement: Broadway Wye and India Crossover project, there is an additional $500,000 in project funds that MTS requests to be transferred to the S7 Replacement Design: 12th and Imperial and Blue Line Project, as it requires additional future FY budget requests for project completion.

WSD & SICAS S7 Replacement: Broadway Wye and India Crossover Project

MTS programmed $2 million in TDA funding for the FY 25 CIP towards this project. At the time of this funding, the project was named Signal Replacement. This project scope of work is to replace the existing axle counter system provided by Siemens with a system provided by Frauscher FAdC Axle Counter System and replace the existing SICAS S7 vital logic controller with an ElectrologIXS Controller at the Broadway Wye and India Crossover on the Blue Line in downtown San Diego. The project name has since been updated to, WSD & SICAS S7 Replacement: Broadway Wye and India Crossover, to remove confusion due to similarities of its old name with other projects and scopes of work. This $2 million in TDA funding was intended to go to the project described below.

S7 Replacement Design: 12th and Imperial and Blue Line Project

At the time of the TDA funding for the FY 25 CIP mentioned above, this project was named Signal Upgrade – SICAS S7 H&K Design. This project's scope of work is to replace the existing axle counter system provided by Siemens with a system provided by Frauscher FAdC Axle Counter System at 12th and Imperial to Commercial on the Orange Line and replace the existing SICAS S7 vital logic controller with an ElectrologIXS Controller from 12th and Imperial to San Ysidro on the Blue Line. The past names for these two projects were very similar with identical scopes but for different locations. However, this project, S7 Replacement Design: 12th and Imperial and Blue Line, has far more locations, requiring more budget and time to complete design through construction services, explaining why the funds mentioned above were intended to be programmed to it.

Therefore, staff recommends that the MTS Board of Directors authorize the transfer of TDA funding in the amount of $2,500,000.00 from the WSD & SICAS S7 Replacement: Broadway

Wye and India Crossover Project (CIP 2005114501) to the S7 Replacement Design: 12th and Imperial and Blue Line Project (CIP 2005118801).

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Metropolitan Transit System

Agenda Item No. 16

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Bus Tire Lease and Services – Contract Award

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to:

1) Execute MTS Doc. No. B0780.0-25 (in substantially the same format as Attachment A) with Michelin North America, Inc. (Michelin) for Bus Tire Lease and Services for a five (5) year base period with two (2) 1-year options, and an estimated run-out period of up to three(3) years for a total of $14,078,962.82; and

2) Exercise the option years at the CEO's discretion

Budget Impact

The total contract cost of services is estimated to be in the amount of $14,078,962.82 (Attachment C). This project will be funded by the MTS Bus Maintenance Operating Budget account 315014-544100.

DISCUSSION:

MTS currently operates one hundred forty-four (144) buses out of the Imperial Avenue Division (IAD) and one hundred thirteen (113) buses out of the Kearny Mesa Division (KMD), which operates seven (7) days per week, twenty-four (24) hours a day. MTS contracts with bus tire manufacturers to provide newly manufactured bus tires on a lease rate per mile basis at a predetermined fixed rate, as well as on-site tire servicing at a fixed monthly rate.

On April 4, 2025, MTS issued a Request for Proposals (RFP) for bus tire lease and services on PlanetBids. MTS received one (1) proposal on the due date of May 9, 2025, from the following firm:

Proposer	Firm Certification
Michelin North America, Inc.	N/A

To confirm that the solicitation was not unduly restrictive, MTS conducted a post-proposal survey with prospective proposers requesting their reason(s) for not proposing. MTS received two (2) responses. The responses determined that neither the RFP nor MTS' procurement process played a role in their decision not to participate, and staff proceeded with a review of the single proposal received under this competitive solicitation.

Michelin North America's proposal was deemed responsive and responsible and was evaluated by a committee comprised of representatives from the MTS Finance and Bus Maintenance departments. The proposal was evaluated on the following:

Qualifications, Related Experience, and References of Proposer	30%
Proposed Staffing, Firm Organization, and Management Plan	10%
Work Plan	30%
Cost and Price	30%
	100%

The following table illustrates the initial scores of Michelin:

PROPOSER	INDEPENDENT COST ESTIMATE	TOTAL COST	TOTAL AVERAGE TECH SCORE	TOTAL AVERAGE COST SCORE	TOTAL AVERAGE SCORE TOTAL POSSIBLE: 100
Michelin North America, Inc.	$17,381,936.07	$14,532,082.75	58.33	24.00	82.33

As a result of the initial review, MTS requested additional clarifications from Michelin regarding their monthly fixed fee rates, re-cap services, and work plan for vacation/holiday coverage and shift schedules. After receiving the clarifications and negotiations, Michelin reduced their cost proposal by $453,119.93, which is a 3.2% cost savings to MTS. Final scores are as follows:

PROPOSER	INDEPENDENT COST ESTIMATE	TOTAL COST	TOTAL AVERAGE TECH SCORE	TOTAL AVERAGE COST SCORE	TOTAL AVERAGE SCORE TOTAL POSSIBLE: 100
Michelin North America, Inc.	$17,381,936.07	$14,078,962.82	58.33	24.00	82.33

Based on the objectives of this procurement, consideration of the evaluation criteria, and Michelin's technical and cost proposals, the evaluation committee determined that Michelin presented the best overall value to MTS.

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to:

1) Execute MTS Doc. No. B0780.0-25 (in substantially the same format as Attachment A) with Michelin for Bus Tire Lease and Services for a five (5) year base period with two (2) 1-year options, and an estimated run-out period of up to three (3) years for a total of $14,078,962.82; and

2) Exercise the option years at the CEO's discretion

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachments: A. Draft Agreement MTS Doc. No. B0780.0-25
B. Scope of Work
C. Cost Proposal

Metropolitan Transit System

STANDARD AGREEMENT

FOR

MTS DOC. NO. B0780.0-25

BUS TIRE LEASE AND SERVICES

THIS AGREEMENT is entered into this _____ day of _____, 2025 in the State of California by and between San Diego Metropolitan Transit System ("MTS"), a California public agency, and the following, hereinafter referred to as "Contractor":

Name: Michelin North America, Inc.

Address: One Parkway South

Greenville (City) SC (State) 29615 (Zip)

Form of Business: Corporation
(Corporation, Partnership, Sole Proprietor, etc.)

Email: michelin.fleetsolution@michelin.com

Telephone: 864-458-5000

Authorized person to sign contracts: Ed Quigley (Name) Director of Operations, Connected Services AMN (Title)

The Contractor agrees to provide services as specified in the conformed Scope of Work/Technical Specification (Exhibit A), Contractor's Cost/Pricing Form (Exhibit B), and in accordance with the Standard Agreement, including Standard Conditions (Exhibit C), Forms (Exhibit D).

The contract term is for up to five (5) base years and two (2) option years, exercisable at MTS's sole discretion. A run-out period not to exceed three (3) years will take effect at the end of the base period or the last exercised option period. Base period shall be effective July 1, 2025 through June 30, 2030 and option years shall be effective July 1, 2030 through June 30, 2032, if exercised by MTS. Tire lease rates of the final base or option year will apply to the entire run-out period.

Payment terms shall be net 30 days from invoice date. The total contract amount for the base period shall not exceed $8,876,974.49, and the option year period shall not exceed $3,945,475.49, without the express written approval of MTS. The run-out period shall not exceed $1,256,512.84 without the express written approval by MTS for an estimated grand total not to exceed the value of $14,078,962.82.

SAN DIEGO METROPOLITAN TRANSIT SYSTEM	MICHELIN NORTH AMERICA, INC.
By: _____ Sharon Cooney, Chief Executive Officer Approved as to form: By: _____ Karen Landers, General Counsel	By _____ Title: _____

SCOPE OF WORK/TECHNICAL SPECIFICATIONS

1.1. BACKGROUND

The tire leasing services will support the MTS bus fleets at the Imperial Avenue Division (IAD) located at 100 16th Street, San Diego, CA 92101 and the Kearny Mesa Division (KMD) located at 4630 Ruffner Street, San Diego, CA 92111. Each division may operate a fleet consisting of forty foot (40'), and sixty foot (60') articulated transit buses. The 40' buses require six (6) tires per bus. The 60' buses require ten (10) tires per bus. Both locations operate twenty-four hours per day, every calendar day of the year.

During the performance period of this contract, it is anticipated that MTS will purchase other types of transit buses. These other type of transit buses may come equipped with tires of different size and type than what is currently in service. Should this occur, MTS will request pricing and technical compliance documentation for the purpose of negotiating a final price with the Contractor. MTS reserves the right to purchase or lease tires elsewhere should an acceptable agreement not be reached by MTS and the Contractor for said bus tires.

1.2. SCOPE OF WORK

The Contractor shall supply new tires and only new tires capable of being re-treaded and re-grooved, at both the IAD and KMD facilities. Only new tires will be installed on the front, steering wheel positions and must be balanced before installation. Tires removed from front, steering wheel positions will then be utilized for other wheel positions and will not require balancing in the center or rear axle tire/wheel positions. Retreaded tires will be permitted on non-steer axles. In addition, the Contractor shall furnish all equipment, supplies, and skilled labor necessary to balance, install, remove, repair, or re-groove tires as required and in accordance with the California and/or Federal Department of Transportation regulations and standards. The Contractor shall repair or re-groove only those tires determined to be safe for revenue service. The Contractor shall provide and maintain adequate tools, supplies, and equipment required for day-to-day operations. The equipment shall include, but is not limited to the following:

- Jacks
- Re-Grooving Equipment
- Tire Mounting and Balancing Equipment Wheel Balancing Weights
- Valve Stems and Caps

MTS will furnish sufficient space, electricity, and compressed air supply onsite at each division for the storage, repair, and care of tires without charge to the Contractor. MTS is providing the facility as is. If the Contractor feels improvements such as electrical wiring, plumbing, or structural must be made, it is the Contractor's responsibility to make those improvements at its expense. All improvements must be approved by MTS and meet or exceed all local building and fire codes and become the property of MTS without compensation to the contractor unless mutually agreed upon in an authorized contract amendment. The Contractor must also keep the service area in a neat and orderly fashion at all times.

The Contractor shall properly dispose of damaged or scrapped tires and any Contractor owned tools and equipment at its expense and maintain documentation of proper disposal. Proper disposal of previous Contractor damaged or scrapped tires and documentation regarding disposal, will be the responsibility of the previous Contractor.

In the event MTS finds it necessary to move the service area to a new location off-site from the existing properties where work is being performed, MTS will provide the Contractor with a service area of like size and configuration. The Contractor will be required to submit a work plan and cost relocation proposal within ten (10) calendar days of the written request from MTS.

MTS is providing a proven, adequate size and secured facility for the Contractor to perform its duties. Should the Contractor experience loss of inventory or equipment at the facility as a result of theft, fire, flood, act of God, or war. MTS will not be liable in any way. The Contractor and or its insurer will carry the loss.

1.3. NOTICE OF LABOR DISPUTE

Whenever the Contractor has knowledge that any actual or potential labor dispute may delay this agreement. The Contractor shall immediately notify and submit all relevant information to the MTS project manager in writing. The Contractor shall insert the substance of this entire clause in any subcontract hereunder and submit an action plan to demonstrate proper coverage to prevent a lapse in services.

1.3.1. FORCE MAJEURE

Contractor shall not be liable for a failure to perform that arises from causes or events beyond its reasonable control and without its fault or negligence. Contractor may suspend performance of its obligations under this Agreement without obligation to Customer during the occurrence of any excusable delay. Excusable delays shall include, but not be limited to, results from acts of God or public enemy, restrictions, prohibitions, priorities or allocations imposed by governmental authority, strikes or labor disputes, lack of or inability to obtain raw materials or supplies, floods, fires, earthquakes, epidemics, or unusually severe weather. Notwithstanding the aforementioned, strikes or labor disputes of Contractors own labor force shall not be grounds for Force Majeure.

1.4. NEW MATERIAL

Except for those tires and components which the agreement specifically provides need not be new (e.g. scrap tires for bus disposal), the Contractor represents that the tires and components to be provided under this agreement are new (not used, reconditioned, or retread, and not of such age or so deteriorated as to impair their usefulness or safety). If at any time during the performance of this agreement, the Contractor believes that the furnishing of supplies or components which are not new is necessary or desirable, the Contractor shall notify MTS immediately, in writing, explaining the reasons therefore and proposing any consideration which will flow to MTS if authorization to issue such supplies is granted.

1.5. INVOICES

MTS tracks mileage by odometer readings and prepares a report at the end of each month indicating the total miles for each bus and bus series. This report is then

electronically transmitted in spreadsheet format (e-mailed) to the current Contractor, and to the previous Contractor/s if in a run-out situation, in a timely manner consistent with MTS mileage tracking and odometer maintenance.

The Contractor will be required to prepare and submit hard copies, referred to as a Billing Basis Spreadsheet (BBS) via mail or courier and send an accompanying electronic copy via email to the MTS Project Manager. The BBS will accompany and correlate with the monthly invoice. The BBS will provide enough information that the MTS Administrator can determine correctness of all invoicing submitted for payment. The current Contractor and the run-out Contractor/s will provide separate invoices for each month's billing. The invoice will include the Contractor's name, invoice number, tire sizes and respective mileages for leased tires and service mileage for the monthly period. In the event a discrepancy occurs between the current Contractor's invoice and the run- out Contractor's invoice, for example, both Contractors are billing mileage for the same wheel positions. MTS will withhold payment on the portion of the invoice in dispute from both Contractors. Because it is the current Contractor's ultimate responsibility to correctly track all tires and their movement, it is the current Contractor's responsibility to research and resolve the invoicing discrepancy. The invoice discrepancy should be resolved in a timely manner for the benefit of all parties. MTS will not complete payment to any or all parties until the discrepancy is corrected. Both Contractors must come to a mutually agreed correction for the invoice discrepancy. Each Contractor must then re-submit invoices and/or credits that reflect the agreed upon correction.

Invoices must be sent to the MTS Accounting Department, via email, at ap@sdmts.com. All invoices must have the Purchase Order (PO) and MTS Contract number clearly displayed to ensure timely payment. MTS will not pay on packing slips, receiving documents, delivery documents, or other similar documents. Invoices must be submitted for payment.

Payment terms shall be net 30 days from invoice date.

Contractors must also indicate if any of the invoiced amount(s) is for service or work provided by a subcontractor and indicate the amount that will be paid to the subcontractor. Contractors must also comply with the prompt payment requirements in the Prompt Progress Payments section of the Standard Conditions.

1.6. WARRANTIES

1.6.1. The Contractor warrants to MTS that, for the life of the tires, each tire shall conform with the requirements thereof and will be free from defects in materials and workmanship. In addition to other remedies, which may be available, MTS may, at its option, return any nonconforming or defective tires to the Contractor and/or required correction or replacement of said item at the location of the item when the defect is discovered, all at the Contractor's risk and expense. MTS's rights hereunder are in addition to but not limited by the Contractor's standard warranties. Inspection and acceptance of items by MTS, or payment; therefore, shall not relieve Contractor of its obligations hereunder.

1.6.2. Any supplies or parts thereof corrected or furnished in replacement pursuant to this clause shall also be subject to all provisions of this clause to the same extent as supplies initially delivered.

1.7. MTS "CONTRACT SERVICES"

During this contract, MTS may choose to operate under contract with other entities for transit operational services. As the Contractor, MTS may be responsible for the maintenance and operation of other buses for another local city. If this is to occur, MTS would perform the tire work on those buses and transport the tires to and from the tire shop at the Imperial Avenue Division. The Contractor would perform the mounting and dismounting, remounting, and balancing at the IAD division. It would be the Contractor's responsibility to ensure accurate records are kept for these tires.

1.8. TECHNICAL REQUIREMENTS

1.8.1. TIRES

Tires shall be textile-type nylon, steel (radials), or approved equal. All tires furnished shall be capable of being re-grooved. The contractor shall furnish new, original tread tires. MTS will not accept "blemished" tires. Retreading (Recapping) tires is allowed on non-steering axles only. Non steer axle tires cannot be recapped more than once per casing for use on the MTS fleet. The tires shall be of a type, which will provide reliable use and service, free from excessive noise and vibration, free from defects in material and construction, and shall meet or exceed vehicle rated load capacity. MTS shall not be precluded during the life of the contract from including under the contract, new or improved tires that may be developed by the Contractor.

Front wheels of all buses shall be equipped with original tread tires only. As established by the Federal Department of Transportation, at no time shall any tire remain in service on MTS vehicles with less than 5/32 of an inch (front) and 2/32 of an inch (rear) tread depth when measured in a major tread groove. The measurement shall not be made where tie bars, bumps, or fillets are located. All tires will be individually and uniquely branded for identification and tracking purposes, prior to delivery.

The Contractor shall provide tires under this contract and shall be subject to any applicable Federal Trade Commission Orders. The contractor shall supply tires that meet or exceed all United States Government, State of California and focal regulations. The Contractor shall maintain tires in a condition, which meet these laws and regulations at all times. All tires provided are to be factory molded and 0.0.T. approved for 65 mile per hour, city and suburban use. The Contractor shall supply MTS with Material Safety Data Sheets (MSDS) for all supplies used to maintain tires.

Contactor is responsible for the proper legal disposal of tires and all related costs.

1.8.2. TYPE AND SIZE OF TIRES

MTS's current fleet of 257 buses are presently equipped as follows:

Summary of MTS Bus Fleet

IAD

Bus series	Qty	Year	Brand	Model	Tire Size	# tire positions
600	21	2011	New Flyer	40ft LFR	305/70/22.5	6
700	31	2012	New Flyer	40ft LFR	305/70/22.5	6
800	26	2013	Gillig	Gillig 40 ft CNG	305/85/22.5	6
1200	18	2013	New Flyer	XN60	305/70/22.5	10
1600	7	2021	Gillig	Gillig 40 BEV	305/70/22.5	6
1700	15	2020	Gillig	Gillig 40 ft CNG	305/85/22.5	6
1800	26	2021	New Flyer	XN60	305/70/22.5	10

KMD

Bus series	Qty	Year	Brand	Model	Tire Size	# tire positions
200	23	2015	Gillig	Gillig 40 ft CNG	305/85 R22.5	6
900	12	2014	Gillig	Gillig 40 ft CNG	305/85 R22.5	6
1300	13	2015	New Flyer	XN60	305/70 R22.5	10
1400	10	2017	Gillig	Gillig 40 ft CNG	305/85 R22.5	6
1500	2	2019	New Flyer	XE 40	305/70 R22.5	6
1700	24	2020	Gillig	Gillig 40 ft CNG	305/85 R22.5	6
1900	29	2024	New Flyer	XN60	305/70 R22.5	10

1.8.3. RATES

Tire Lease Rates: The tire rates shall be fixed, not subject to any escalation, for each year of the contract including the options and run-out periods. The rates are broken down by the tire size. ENTER THE RATES ON THE MTS PROVIDED PRICE FORM PER TIRE MILE.

Service Rates: A separate service rate shall be used since sales taxes are applicable only to material purchases. The service rate shall be fixed, not subject to any escalation, for each year of the contract including the options and run-out periods. ENTER THE RATES ON THE MTS PROVIDED PRICE FORM PER MONTH.

Tire Purchase Rates: There may be circumstances where MTS is required to purchase limited quantities of tires to be placed on buses designated for contracted service operations (operated by a different Contractor).

The fixed pricing for prospective tire purchases will NOT be taken into consideration for the purposes of evaluation scoring. The tire rates shall be fixed and not subject to escalation, for each year of the contract including the options. The rates are broken down by the tire size. ENTER THE PRICES ON THE MTS-PROVIDED COST FORM.

1.8.4. LOSS OR ABUSE

Any tires rendered unfit for service not attributable to material or workmanship, or due to contractor's negligence, shall be repaired by the Contractor. In the event tires are beyond repair, MTS shall not be held responsible for additional payment on tires which fail as a result of, but not limited to curbing, running flat, improper wheel alignment, or involved in a collision, or because of defective rims or wheels. Costs for damaged tires, if any, shall be included in the price per tire mile. The Contractor is responsible for disposal of all damaged or scrap tires. It is the Contractor's responsibility to properly track and document all tire movement at all MTS facilities and to securely store all unused tires in their inventory. MTS shall not be held responsible for any tires lost, misplaced, or stolen from the Contractor.

Contractor shall maintain title in all tires furnished by Contractor to MTS, and MTS shall not release any tire out of its possession and control except as contemplated by this agreement, unless otherwise agreed upon in writing by the parties.

1.8.5. SALE OR SCRAPPING OF BUSES

In the event buses are scrapped or sold and the lease tires installed on those buses are not of a size that can be used on other buses in the MTS fleet. The Lessor shall make all reasonable efforts to relocate the tires to another lease property. If this cannot be achieved, MTS shall pay the Contractor the difference between the actual mileage on the tire and the actual mileage obtained in such size of original tread worn out in the service of MTS during the previous twelve months, or other such determination as mutually agreed by the Contractor or MTS. Such tires will become the property of MTS.

MTS will provide the Contractor with sufficient advanced notice when buses are scheduled for sale or disposal. If the tires on said buses are of a size that can be used on other buses in MTS's fleet, MTS intends to run the tires in service. The Contractor must make a diligent effort to collect and or supply scrap tires to mount on these buses at no charge. If after due diligence the Contractor cannot supply scrap tires in quantities sufficient to support the buses scheduled for sale or disposal, MTS may outsource scrap or used tires and provide them to the Contractor for mounting at no charge. Scrap tires must hold air only. MTS does not intend to operate buses equipped with scrap or unfit tires on public streets or to transport any person/s. The Contractor will not be held responsible for buses equipped with scrap or unfit tires and driven by MTS personnel.

1.8.6. SERVICE PERSONNEL

a) The Contractor will be required to have adequate personnel regularly assigned to MTS property in order to perform all required tire services. Since both divisions house approximately the same amount of buses and support vehicles, the labor force should be evenly divided between divisions. Hours are to be designated by mutual agreement between Contractor and MTS's Chief Operating Officer or the Director of Maintenance. MTS preference for coverage is as follows:

- IAD Evening shift to be Sunday thru Thursday 6pm -230 am
- KMD Morning shift to be 6am -230pm Monday thru Friday
- Saturday should be a split morning shift between IAD and KMD

1. In the event of work needed outside the above hours, a contact person will be made available that can respond to calls within ninety (90) minutes to facilitate necessary tire work.
2. Schedules should be such where tire personnel are available on holidays where MTS maintains a regular weekday sign-out. Those Holidays are: Martin Luther King Day and Cesar Chavez Day.
3. The contractor will provide a foreman that is available during regular business hours to facilitate communication between the contractor and MTS personnel.
4. Any changes in hours are to be mutually agreed upon by both the contractor and the Chief Operating Officer or the Director of Maintenance.
5. Personnel must call the foreman's office in the event of an absence.
6. Personnel must notify the foreman if leaving the property other than for lunch.

b) The Contractor shall perform the following services in addition to other services or requirements in the contract for all MTS's fleet, including support vehicles (equipped with MTS owned tires).

1. Mount and dismount all tires.
2. Balance Front Steering Tire/Wheel positions (center and rear axle tire/wheel positions do not require balancing).
3. Perform repairs to tires.
4. Maintain recommended tire pressures. TPMS sensors to be installed as needed
5. Rotate tires on vehicles in the interest of efficiency and safety as determined by the contractor.
6. Inspect all rims for cracks, and bead wear using manufacturers recommended procedures.
7. Notify MTS prior to discarding rims and the need for replacement rims.
8. Torque all tire lug nuts to manufactures specifications using the proper torque sequence every time a tire is changed.
9. All wheel lug nuts are to be marked after torque using torque indicators to enhance identification of loosening lug nuts.
10. Maintain valve stems and caps on all wheels. Tires owned by a previous Contractor and in a run-out period shall be the responsibility of the previous Contractor.
11. Dispose of fill tires, from any MTS vehicle in manner consistent with local, State and Federal law.
12. Tires owned by Goodyear and in a run-out period shall be the responsibility of Goodyear.

c) The Contractor will conduct partial fleet inspections weekly in order to complete the entire fleet on a monthly basis. The following information will be collected using a Fleet Analysis Form (or electronic / automated device):

1. Date of inspection.
2. Bus number.
3. Bus location i.e. KMD, IAD.
4. Tire pressure at each tire location.
5. Tread depth at each tire location.

The Fleet Analysis Form will be completed and turned-in to the MTS Maintenance department Divisional Manager on Monday each week.

d) A Bus Tire Work Form will be filled out for each bus that has received tire work. These forms shall be submitted to the MTS Maintenance department on Monday every week. This form will include the following information:

1. Bus number.
2. Date work completed.
3. What was the reason for tire work?
4. What work was completed? Location of tire/s on the bus.
5. Serial numbers of tire/s removed and serial number of tire/s installed.
6. Mileage on the bus.
7. Signature of tire serviceman performing the work.

e) MTS personnel will also do inspections of the fleet. All buses found by MTS or the Contractor to have tire or wheel defects will be pulled from service and made available to the contractor for repair that evening and those defects must be repaired or corrected by 3:00 am the following day ready for service. Tire and wheel defects are to include but are not limited to the following: improper inflation, flats, worn out tread depth, mismatched duels, absent or improperly torque wheel nuts, damaged wheels and any defects found to be unsafe. The Contractor's failure to perform these repairs will cause the bus to be held from service and may result in liquidated damages in the amount of **$223.10** per day, per bus that is prevented from entering revenue service due to incomplete tire and wheel Repairs. In the event the Contractor cannot provide service or tires due to the lack of equipment, tools, personnel, or inventory and buses are held from service the above-mentioned liquidated damages will also apply. Liquidated damages are based on the average revenue collected per bus per in-service day.

Should liquidated damages exceed the cumulative amount of $10,000 .00 during the performance period of the contract, MTS reserves the right to pursue termination for cause and assess liquidated damages for the purpose of reimbursing direct staff time associated with conducting a new procurement or other expenses directly related to termination of the contract.

MTS is responsible for timely supplying reconditioned or new wheels for use in tire servicing to the Contractor after receiving notification from Contractor of such need. If it is determined during inspections by MTS or Contractor that, the fleet is experiencing tire or wheel defects on 5% or more of MTS's operating fleet, the Contractor will be required to make emergency repairs or replacements to the fleet and bring it back under the 5% level. These emergency repairs must be completed within a twenty-

four (24) hour period. Any additional costs incurred by the Contractor to make the above emergency repairs will be the Contractor's responsibility.

f) The Contractor is required to conduct a complete inventory of the MTS fleet a minimum of four (4) times a year. A report of this inventory is to be provided to MTS. This report will include; bus numbers, tire serial numbers, and tire locations on all buses. The report will also include tires serial numbers, type, and quantities located in the Contractors shop areas, and in MTS Brake shops. The report will also document all tires removed from service or inventory during the previous quarter. The Contractor must establish an efficient way to track tire and wheel assemblies removed from buses and held in MTS's Brake or Maintenance shops or the Contractors shop areas for reinstallation at a later date.

g) All wheels shall be inspected by the Contractor's personnel for defects and wear prior to installation on a bus. The Contractor's personnel will decide if the wheel is safe for use or recommend replacement to MTS staff. The Contractor will notify MTS Maintenance department when new wheels are required.

h) The Contractor will ensure that all wheels are cleaned and in visibly attractive appearance before they are installing on the bus. The Contractor's employee will not be required to clean the wheels. While conducting tire maintenance, wheels identified to have visible signs of grease, oil, or other substance must be taken to the steam rack for cleaning prior to being reinstalled on a vehicle. Wheels will be cleaned by MTS employees within twenty- four (24) hours of notice.

i) The movement of buses to and from the tire shop area is the responsibility of the Contractor. Bus movement by the Contractor is limited to on-the-lot-driving only. The Contractor will be responsible for any damage resulting from the Contractors' employee(s) operating MTS buses. The Contractor's employees are not permitted to operate any of MTS's vehicles on public roads.

j) The Contractor shall provide a work schedule which specifies the operating hours of tire shop, break periods, and lunch periods. The Contractors' employees shall report to foreman in charge of the shift at the beginning and end of their scheduled work period. The Contractor must provide a substitute employee during employee absences regardless of the reason. The Contractor shall provide a listing of phone numbers to be contacted if the Contractor's employees do not show for work or in case of an emergency.

k) Contractor will provide a copy of their employee conduct policy for review and approval. Should the policy be lacking or inconsistent with MTS's policies, the MTS will provide the Contractor with copies of the appropriate sections of the MTS Employee Handbook for guidance.

All Contractor employees will be required to follow the rules outlined in the guide. MTS supervisory staff will have the authority to request

immediate replacement of Contractor employee/s based on performance issues and compliance to the rules of conduct.

l) The Contractor will be required to comply with U.S. DOT regulations regarding Drug-Free Workplace requirements 49 C.F.R. Part 29, Subpart F. Contractor will submit a copy of their drug and alcohol policy to MTS and will submit an example of their most recent MIS report prior to the start of the contract. Contractor shall also submit the contact information of their drug and alcohol program manager. MTS shall have the right to audit the contractor's drug and alcohol records for employees assigned to this agreement.

m) Contractor employees who may operate a forklift on MTS property must hold and maintain a certified forklift license. A copy of the license will be kept on file at each site which the employee may operate a forklift. Contractor employees will be permitted to participate in MTS forklift license courses.

n) Background Check - The Contractor shall conduct a County and Statewide background check, Criminal or Civil and Driver's License Record on all service personnel prior to employment to ensure that the personnel meet the following standards and are qualified to perform all of the tasks as described. The background check shall include an examination of criminal history from any County and State in which the applicant resided within the past seven (7) years and a current motor vehicle record ("MVR").

1. Must be at least 18 years old.
2. Continuous possession of a valid Driver's License.
3. No person can be serving a probated sentence for a felony.
4. No felony convictions.
5. No misdemeanor criminal convictions that would be a danger to personnel safety or loss of property. (Misdemeanors will be reviewed on a case by case basis by the Operations Manager.)
6. Ability to pass Federal drug and alcohol testing. Applicants terminated by previous employer due to drug or alcohol usage shall not be eligible for hire.

1.8.7. RESERVE TIRES

The Contractor must agree to keep at each bus division a sufficient reserve supply adequate to ensure proper tire service on all buses operating from said division. MTS shall provide an appropriate area for all necessary tire storage and servicing. Prior to commencement of contract service, the Contractor shall propose the number of reserve tires to be supplied at each operating division for approval by MTS's Director of Maintenance or his designated representative.

1.8.8. UNFIT TIRES

The Contractor will remove tires from service when determined unfit by either the Contractor or MTS. No more than fifty (50) scrap tires shall accumulate at either division.

1.9. WRITTEN INSTRUCTIONS

The Contractor shall provide MTS with copies of documented procedures for the proper use, maintenance, and service of the Contractor's tires.

1.10. EXPIRATION OF AGREEMENT

Upon the termination by full performance and expiration of this Agreement, the Contractor may, at its sole election, (1) require MTS to return to the Contractor all tires, and other products leased hereunder to MTS, or (2) require MTS to pay for all original tread on buses in MTS's garage, in process of repair, and also for extra buses. Payment for original tires shall be on the basis of the unused mileage remaining in such tires, multiplied by the applicable billing rate per tire mile in effect at said termination date. The unused mileage in each original tread tire tires shall be computed by subtracting the mileage already used in each such tires from the actual average mileage obtained on each such classification of tires worn out in the service of MTS during the preceding year.

On six months prior to the normal expiration date of this Agreement, contractor is required to get written (e-mail) approval from the MTS Project Manager for any deliveries of tires to the operational divisions. In case the project manager is unavailable, the MTS Division Manager for the destination tire shop should furnish approval.

The foregoing election of the Contractor notwithstanding, on thirty days written notice prior to the normal expiration date of this Agreement, MTS may elect to continue using (run out) all the tires in MTS's possession at the rate in effect during the six months prior to termination until permanently removed from service, but in no event shall such period exceed thirty-six months after the normal termination date. During said thirty-six-month period, MTS shall, to the extent practicable, continuously use such tires on its highest mileage runs until they are rendered permanently unfit for service. During said "run-out" period, all terms and conditions of this Agreement shall continue to be in effect, provided however, that the Contractor shall not be obligated to furnish any service to MTS or to furnish replacement tires for those tires removed from service. At the expiration of said period, MTS shall pay for remaining original tread and retreaded tires and tubes at the price and in the manner set forth above.

Any payment for tires and tubes required to be purchased by MTS under this or any other provision of this Agreement shall be made within thirty days after date of invoice covering the purchase thereof.

MTS may terminate the agreement at any time by giving written notice to the Contractor of such termination, whether for unavailability of funding, convenience or default, and specifying the effective date thereof, at least thirty (30) days before the effective date of such termination. The Contractor shall be paid its costs including compensation for work satisfactorily performed prior to the effective date and time of termination and contract closeout costs for the remaining value of tread on leased tires mounted on buses and in spare stock. All finished or unfinished documents and other material procured or produced by the Contractor hereunder shall become MTS property upon final payment.

1.11. RUN-OUT OF PRESENT TIRE AGREEMENT

In the event an Agreement is awarded under this Solicitation to a Contractor other than the incumbent Contractor, MTS intends to exercise the "run-out" part of the termination clause in its current agreement, as set forth in section 5.11 herein. It is anticipated that this run-out period could last as long as thirty-six (36) months.

During the run out of the previous Contractor/s tires, the current Contractor should make every effort possible to place the previous Contractor/s tires on the most active buses in the highest wear positions to insure an expeditious run out. The Contractor shall diligently record all tire movements on daily logs as tires are moved to new positions or when brakes or other maintenance tasks are performed requiring tire changes. The mechanic or tire service personnel will record all tire changes on a log/form. The Contractor must supply monthly copies of the tire change or movement logs/forms to the MTS designated administrator. During a run-out period they will also be supplied to the previous Contractor/s. The form will indicate the bus number, date, tire brand applied, tire brand removed, wheel position and mileage at the time of change over.

1.12. NEWLY ACQUIRED BUSES

Vehicles purchased by MTS during the term of this Agreement will be obtained from the manufacturer, or other seller with or without tires and MTS will notify Contractor sixty (60) days in advance of date required so that the Contractor may specify and furnish to the manufacturer's continental North American facility or port of demarcation the size and type of tires to be placed on the vehicles. If any such vehicles equipped with tires furnished by Contractor shall be driven overland instead of being shipped, MTS shall pay Contractor for use of such tires at the billing rate per tire mile then in effect within thirty (30) days after receipt of invoice.

Any tires lost, stolen, or damaged while in possession of the vehicle manufacturer, or other seller, or while the vehicle is being delivered to MTS, shall be paid for by MTS on the basis set forth in the Contract.

Reason: Contractor requires proper notification to schedule production tires that are not part of the normal replenishment; unknown freight costs for delivery outside of North America cannot be predicated based on the specification Information; and tires consigned on MTS behalf are outside of Contractor care, custody and control and Contractor does not have a contract with third party to recover the cost of leased tires.

1.13. LEASED VEHICLES

If leased vehicles are supplied with the Lessor's tires, Contractor shall be notified thirty (30) days in advance and the monthly vehicle mileage will be reported for billing. Should the Company terminate or otherwise lose possession of any of the leased vehicles equipped with Lessor's tires, the Company shall pay for each tire (including spares) in accordance with contract terms.

1.14. [NOT APPLICABLE] HEWLETT PACKARD ENTERPRISE (HPE) MINIMUM REQUIREMENTS

1.15. [NOT APPLICABLE] CISCO MINIMUM REQUIREMENTS

1.16. [NOT APPLICABLE] CONTRACTOR’S INFORMATION SECURITY RESPONSIBILITIES

1.17. [NOT APPLICABLE] BUY AMERICA

1.18. [NOT APPLICABLE] SAFETY DATA SHEETS (SDS)

1.19. [NOT APPLICABLE] NO RIGHT TO POST SIGNS

1.20. REPLACEMENT PARTS

Replacement parts and technical support for the specified equipment must be guaranteed by the manufacturer; to be available for a ten (10) year period from the date of purchase. Manufacturer shall keep parts books and maintenance manuals up-to-date for that period.

1.21. DELIVERY AND ACCEPTANCE

Equipment or any deliverable provided under this contract shall be delivered F.O.B. to Click to choose address unless otherwise specified, in first class condition, complete and ready for operation, and the Contractor shall assume all responsibility and risk of loss incident to said delivery. Contractor shall indicate delivery date on the Bid Form unless already specified, in which case, shall be made within the time set forth. Delivery is part of the consideration and must be adhered to as specified. Contractor will not be held liable for failure to make delivery because of strikes, construction of property, governmental regulations, acts of God or any other causes beyond his control, provided a written extension of time is obtained from MTS. Upon delivery, MTS will acknowledge receipt of said items or products. Delivery shall not constitute acceptance. Upon inspection and testing (if necessary) by MTS, a determination will be made whether said items or products are in conformance with contract requirements. If found in conformance, MTS shall approve the Contractor’s invoice for payment; thereby constituting acceptance. Payment terms begin from this point. If the delivered items or products are found not in compliance, MTS will immediately notify the Contractor and furnish all details of deficiencies. Contractor shall correct the deficiencies or supply new items or products (at the discretion of MTS) and resubmit for inspection and testing (if necessary).

1.22. EXPEDITING

The goods furnished under this Agreement shall be subject to expediting by MTS. MTS shall be afforded free access to Contractor's shops, factories, or places of business, and those of Contractor's suppliers, for expediting purposes. As required by MTS, Contractor shall supply schedules, unpriced copies of purchase orders and progress reports for MTS's use in expediting.

1.23. [NOT APPLICABLE] ACQUISITION OF ROLLING STOCK

MTS DOC. NO. B0780.0-25
BUS TIRE LEASE AND SERVICES RFP
MICHELIN NORTH AMERICA, INC.

	New	Re-thread
BASE YEAR 1	$ 1,627,932.01	$ 1,526,975.74
BASE YEAR 2	$ 1,736,330.14	$ 1,632,597.58
BASE YEAR 3	$ 1,785,333.22	$ 1,678,748.01
BASE YEAR 4	$ 1,837,357.89	$ 1,727,841.58
BASE YEAR 5	$ 1,890,021.23	$ 1,777,493.22
OPTION YEAR 1	$ 1,944,540.81	$ 1,828,918.29
OPTION YEAR 2	$ 2,000,934.68	$ 1,882,132.54
RUN OUT YEAR 1	$ 592,692.97	$ 517,891.28
RUN OUT YEAR 2	$ 414,885.08	$ 362,523.90
RUN OUT YEAR 3	$ 248,934.78	$ 217,517.60
GRAND TOTAL	**$ 14,078,962.82**	**$ 13,152,639.74**

MTS DOC. NO. B0780.0-25
BUS TIRE LEASE AND SERVICES RFP
PROPOSER NAME: MICHELIN NORTH AMERICA, INC.

BASE YEAR 1				
Line #	**Tire Lease**	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
1	Tire Size: 305/70/22.5	25,814,232	$ 0.008875	$ 229,101.31
2	Tire Size: 305/85/22.5	52,238,448	$ 0.009826	$ 513,294.99
	Tire Service	**Months**	**Monthly Rate**	
3	Fixed Rate Monthly Tire Service IAD	12	$ 34,500.00	$ 414,000.00
4	Fixed Rate Monthly Tire Service KMD	12	$ 34,500.00	$ 414,000.00
5			Tax 7.750% (Lines 1 and 2 only)	$ 57,535.71
6			**Base Year 1 Total (Lines 1-5)**	**$ 1,627,932.01**

Ext Cost if Re-Caps utilized in approved cases (Optional)

BASE YEAR 1			
Re-Tread Tires	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
Tire Size: 305/70/22.5	25,814,232	$ 0.007755	$ 200,182.07
Tire Size: 305/85/22.5	52,238,448	$ 0.008586	$ 448,519.31
		Tax 7.750% (Lines 1 and 2 only)	$ 50,274.36
		Base Year 1 Total	**$ 698,975.74**

BASE YEAR 2				
Line #	**Tire Lease**	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
1	Tire Size: 305/70/22.5	25,814,232	$ 0.009119	$ 235,401.59
2	Tire Size: 305/85/22.5	52,238,448	$ 0.010096	$ 527,410.60
	Tire Service	**Months**	**Monthly Rate**	
3	Fixed Rate Monthly Tire Service IAD	12	$ 38,100.00	$ 457,200.00
4	Fixed Rate Monthly Tire Service KMD	12	$ 38,100.00	$ 457,200.00
5			Tax 7.750% (Lines 1 and 2 only)	$ 59,117.95
6			**Base Year 2 Total (Lines 1-5)**	**$ 1,736,330.14**

BASE YEAR 2			
Re-Tread Tires	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
Tire Size: 305/70/22.5	25,814,232	$ 0.007968	$ 205,687.08
Tire Size: 305/85/22.5	52,238,448	$ 0.008822	$ 460,853.60
		Tax 7.750% (Lines 1 and 2 only)	$ 51,656.90
		Base Year 2 Total	**$ 718,197.58**

BASE YEAR 3				
Line #	**Tire Lease**	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
1	Tire Size: 305/70/22.5	25,814,232	$ 0.009370	$ 241,875.14
2	Tire Size: 305/85/22.5	52,238,448	$ 0.010374	$ 541,914.39
	Tire Service	**Months**	**Monthly Rate**	
3	Fixed Rate Monthly Tire Service IAD	12	$ 39,200.00	$ 470,400.00
4	Fixed Rate Monthly Tire Service KMD	12	$ 39,200.00	$ 470,400.00
5			Tax 7.750% (Lines 1 and 2 only)	$ 60,743.69
6			**Base Year 3 Total (Lines 1-5)**	**$ 1,785,333.22**

BASE YEAR 3			
Re-Tread Tires	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
Tire Size: 305/70/22.5	25,814,232	$ 0.008187	$ 211,343.47
Tire Size: 305/85/22.5	52,238,448	$ 0.009065	$ 473,527.07
		Tax 7.750% (Lines 1 and 2 only)	$ 53,077.47
		Base Year 3 Total	**$ 737,948.01**

BASE YEAR 4				
Line #	**Tire Lease**	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
1	Tire Size: 305/70/22.5	25,814,232	$ 0.009628	$ 248,526.71
2	Tire Size: 305/85/22.5	52,238,448	$ 0.010659	$ 556,817.04
	Tire Service	**Months**	**Monthly Rate**	
3	Fixed Rate Monthly Tire Service IAD	12	$ 40,400.00	$ 484,800.00
4	Fixed Rate Monthly Tire Service KMD	12	$ 40,400.00	$ 484,800.00
5			Tax 7.750% (Lines 1 and 2 only)	$ 62,414.14
6			**Base Year 4 Total (Lines 1-5)**	**$ 1,837,357.89**

BASE YEAR 4			
Re-Tread Tires	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
Tire Size: 305/70/22.5	25,814,232	$ 0.008412	$ 217,155.42
Tire Size: 305/85/22.5	52,238,448	$ 0.009314	$ 486,549.06
		Tax 7.750% (Lines 1 and 2 only)	$ 54,537.10
		Base Year 4 Total	**$ 758,241.58**

BASE YEAR 5				
Line #	**Tire Lease**	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
1	Tire Size: 305/70/22.5	25,814,232	$ 0.009892	$ 255,361.19
2	Tire Size: 305/85/22.5	52,238,448	$ 0.010952	$ 572,129.51
	Tire Service	**Months**	**Monthly Rate**	
3	Fixed Rate Monthly Tire Service IAD	12	$ 41,600.00	$ 499,200.00
4	Fixed Rate Monthly Tire Service KMD	12	$ 41,600.00	$ 499,200.00
5			Tax 7.750% (Lines 1 and 2 only)	$ 64,130.53
6			**Base Year 5 Total (Lines 1-5)**	**$ 1,890,021.23**

BASE YEAR 5			
Re-Tread Tires	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
Tire Size: 305/70/22.5	25,814,232	$ 0.008644	$ 223,127.19
Tire Size: 305/85/22.5	52,238,448	$ 0.009570	$ 499,929.16
		Tax 7.750% (Lines 1 and 2 only)	$ 56,036.87
		Base Year 5 Total	**$ 779,093.22**

OPTION YEAR 1				
Line #	**Tire Lease**	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
1	Tire Size: 305/70/22.5	25,814,232	$ 0.010164	$ 262,383.62
2	Tire Size: 305/85/22.5	52,238,448	$ 0.011253	$ 587,863.07
	Tire Service	**Months**	**Monthly Rate**	
3	Fixed Rate Monthly Tire Service IAD	12	$ 42,850.00	$ 514,200.00
4	Fixed Rate Monthly Tire Service KMD	12	$ 42,850.00	$ 514,200.00
5			Tax 7.750% (Lines 1 and 2 only)	$ 65,894.12
6			**Option Year 1 Total (Lines 1-5)**	**$ 1,944,540.81**

OPTION YEAR 1			
Re-Tread Tires	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
Tire Size: 305/70/22.5	25,814,232	$ 0.008881	$ 229,263.19
Tire Size: 305/85/22.5	52,238,448	$ 0.009833	$ 513,677.22
		Tax 7.750% (Lines 1 and 2 only)	$ 57,577.88
		Option Year 1 Total	**$ 800,518.29**

OPTION YEAR 2				
Line #	**Tire Lease**	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
1	Tire Size: 305/70/22.5	25,814,232	$ 0.010444	$ 269,599.17
2	Tire Size: 305/85/22.5	52,238,448	$ 0.011563	$ 604,029.30
	Tire Service	**Months**	**Monthly Rate**	
3	Fixed Rate Monthly Tire Service IAD	12	$ 44,150.00	$ 529,800.00
4	Fixed Rate Monthly Tire Service KMD	12	$ 44,150.00	$ 529,800.00
5			Tax 7.750% (Lines 1 and 2 only)	$ 67,706.21
6			**Option Year 2 Total (Lines 1-5)**	**$ 2,000,934.68**

OPTION YEAR 2			
Re-Tread Tires	**Tire Miles**	**Tire Mile Rate**	**Extended Price**
Tire Size: 305/70/22.5	25,814,232	$ 0.009126	$ 235,567.93
Tire Size: 305/85/22.5	52,238,448	$ 0.010104	$ 527,803.34
		Tax 7.750% (Lines 1 and 2 only)	$ 59,161.27
		Option Year 2 Total	**$ 822,532.54**

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BUS TIRE LEASE AND SERVICES RFP
MICHELIN NORTH AMERICA, INC.

Tire Lease	Tire Miles	Tire Mile Rate	Extended Price
Tire Size: 305/70/22.5	16912500	$ 0.010444	$ 176,631.09
Tire Size: 305/85/22.5	32295631	$ 0.011563	$ 373,431.99
Tax 7.750% (Lines 1 and 2 only)			$ 42,629.89
			$ 592,692.97

Tire Lease	Tire Miles	Tire Mile Rate	Extended Price
Tire Size: 305/70/22.5	11838750	$ 0.010444	$ 123,641.76
Tire Size: 305/85/22.5	22606942	$ 0.011563	$ 261,402.40
Tax 7.750% (Lines 1 and 2 only)			$ 29,840.92
			$ 414,885.08

Tire Lease	Tire Miles	Tire Mile Rate	Extended Price
Tire Size: 305/70/22.5	7103250	$ 0.010444	$ 74,185.06
Tire Size: 305/85/22.5	13564465	$ 0.011563	$ 156,844.90
Tax 7.750% (Lines 1 and 2 only)			$ 17,904.82
			$ 248,934.78

Ext Cost if Re-Caps utilized in approved cases

RUN-OUT YEAR 1

Re-Tread Tires	Tire Miles	Tire Mile Rate	Extended Price
Tire Size: 305/70/22.5	16912500	$ 0.009126	$ 154,335.12
Tire Size: 305/85/22.5	32295631	$ 0.010104	$ 326,306.44
Tax 7.750% (Lines 1 and 2 only)			$ 37,249.72
Base Year 1 Total			**$ 517,891.28**

RUN-OUT YEAR 2

Re-Tread Tires	Tire Miles	Extended Price	Extended Price
Tire Size: 305/70/22.5	11838750	$ 0.009126	$ 108,034.58
Tire Size: 305/85/22.5	22606942	$ 0.010104	$ 228,414.51
Tax 7.750% (Lines 1 and 2 only)			$ 26,074.80
Base Year 2 Total			**$ 362,523.90**

RUN-OUT YEAR 3

Re-Tread Tires	Tire Miles	Extended Price	Extended Price
Tire Size: 305/70/22.5	7103250	$ 0.009126	$ 64,820.75
Tire Size: 305/85/22.5	13564465	$ 0.010104	$ 137,051.73
Tax 7.750% (Lines 1 and 2 only)			$ 15,645.12
Base Year 3 Total			**$ 217,517.60**

Metropolitan Transit System

Agenda Item No. 17

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Uninterruptible Power Supply (UPS) On-Site Maintenance Support Services – Sole Source Contract Award

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. G3075.0-25 (in substantially the same format as Attachment A) with Schneider Electric IT Corporation (Schneider), on a sole source basis, for the provision of on-site UPS maintenance support services for a period of five (5) years in the amount of $1,073,264.20.

Budget Impact

The total cost of this contract is estimated to be $1,073,264.20. This project will be funded by the Information Technology (IT) Operations Budget account 661010-571250.

DISCUSSION:

MTS utilizes UPS and Automatic Transfer Switches (ATS) to maintain critical business systems and network connectivity in the event of a power outage.

MTS has deployed IT equipment across all trolley stations, where it is located in communication cabinets along the right-of-way. These cabinets are secured (locked) with access limited to authorized staff. The computer equipment within these cabinets supports Closed-Circuit Television (CCTV), Public Announcement (PA), network switches, fare system communication, and track control. All of these systems are connected through a UPS or multiple UPS units in order to protect them from damage during a power loss or power fluctuations. The UPS units installed at MTS trolley stations were initially procured on behalf of MTS by the San Diego Association of Governments (SANDAG) beginning in 2012 and were primarily manufactured by Schneider.

In 2015, after the completion of the Trolley Renewal Project, SANDAG turned over the operational support of the trolley stations to MTS, which included the UPS units. All of the UPS units had been installed with an original manufacturer's one-year warranty, which had expired by the time MTS took over operational support. In 2017, MTS entered into a sole source

contract with Schneider, the original equipment manufacturer, for on-site repair and support services for our Schneider UPS units. That contract expires on July 14, 2025. Today's proposed action would approve a new, five (5) year contract with Schneider to continue providing on-site maintenance support services for these units.

This is a sole source procurement with the original equipment manufacturer for post-warranty UPS maintenance and repair services. Other service providers cannot offer the benefits of Schneider factory-trained technicians or the proprietary documentation and materials integral to providing our required level of service. Schneider is also unable to ensure the reliability of competitor parts and materials provided or installed on its equipment. Schneider informed MTS that warranty and contracted customers who elect to use competitor parts and service risk voiding their coverage plans and may incur additional charges as a result of unauthorized modifications to equipment.

The proposed contract also includes $100,000.00 for as-needed hardware and support for the five (5) year period. In comparison to staff's Independent Cost Estimate (ICE) in the amount of $1,019,683.75, staff has deemed the costs to be fair and reasonable.

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to execute MTS Doc. No. G3075.0-25 (in substantially the same format as Attachment A) with Schneider, on a sole source basis, for the provision of on-site UPS maintenance support services for a period of five (5) years in the amount of $1,073,264.20.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachments: A. Draft Agreement
B. Cost Proposal

Metropolitan Transit System

STANDARD AGREEMENT

FOR

MTS DOC. NO. G3075.0-25

UPS MAINTENANCE SUPPORT SERVICES

THIS AGREEMENT is entered into this _____ day of _____, 2025 in the State of California by and between San Diego Metropolitan Transit System ("MTS"), a California public agency, and the following, hereinafter referred to as "Contractor":

Name: Schneider Electric IT Corporation

Address: 5081 Collections Center Dr.

Chicago IL 60693-5081
City State Zip

Form of Business: Corporation
(Corporation, Partnership, Sole Proprietor, etc.)

Email: albertlawrence.monton@se.com

Telephone: 401-301-2085

Authorized person to sign contracts Alexis Hart VP, Secure Power Service Sales
Name Title

The Contractor agrees to provide services with goods as specified in the conformed Scope of Work/Technical Specification (Exhibit A), Contractor's Cost/Pricing Form (Exhibit B), and in accordance with the Standard Agreement, including Standard Conditions (Exhibit C), and Forms (Exhibit D),

The contract term is for five (5) years effective July 15, 2025 through July 14, 2030.

Payment terms shall be net 30 days from invoice date. The total cost of this contract shall not exceed $1,073,364.20 without the express written consent of MTS.

SAN DIEGO METROPOLITAN TRANSIT SYSTEM	SCHNEIDER ELECTRIC IT CORPORATION
By: _____ Sharon Cooney, Chief Executive Officer	By _____
Approved as to form:	
By: _____ Karen Landers, General Counsel	Title: _____

5 Year Service Contract Renewal for San Diego Metropolitan Transit System (SE Gear)

Schneider Electric Reference :	OP-250501-15365971	**Prepared For**	San Diego Metropolitan Transit System
Service Quote Number	2025-2505237	**Sales Contact**	Albert Lawrence Monton
Quote Date	5/8/2025		

SCHNEIDER ELECTRIC IT CORP.
70 Mechanic Street - Foxboro, MA 02035 -
http://www.schneider-electric.com

Life Is On Schneider Electric

Products and Services (All Prices in USD)

Start Date	End Date	Quantity	Part Number	Description	Extended Price
7/15/2025	7/14/2026	1	QWVUPS-QJRA43451-00	Schneider Onsite Support	$ 194,652.84
7/14/2026	7/14/2027	1	QWVUPS-QJRA43451-01	Schneider Onsite Support	$ 194,652.84
7/15/2027	7/14/2028	1	QWVUPS-QJRA43451-01	Schneider Onsite Support	$ 194,652.84
7/15/2028	7/14/2029	1	QWVUPS-QJRA43451-03	Schneider Onsite Support	$ 194,652.84
7/15/2029	7/14/2030	1	QWVUPS-QJRA43451-04	Schneider Onsite Support	$ 194,652.84

QUOTE TOTAL (USD) $ 973,264.20

Specific Note:

- The quote total above does not include Applicable Taxes.
- Please note that the pricing outlined in this proposal is only valid with the purchase of the full 5-year term.
- Due to the extreme volatility in the commodities and labor markets, this quotation is valid for until June 30, 2025. Currently there is extreme volatility due to tariffs and market changing conditions in the steel, copper, Aluminum, and plastics. We will do our best to hold pricing, but there are many factors beyond our control and these potential increases would be passed along to the customer. It is also assumed that this project will be executed within 12 months. If the execution timeline of this project exceeds this timeframe, any price escalations would also be passed along to the customer.

Scope of Work:

Single Phase Units:

- Includes: Parts, Labor, Travel, and Break-fix Batteries.
- Response Time listed for each Unit.

Three Phase Units:

- Includes: Parts, Labor, Travel.
- Response Time listed for each Unit.
- Exclusions: Batteries, Capacitors, and Fans for APC 25kW Galaxy VS UPS units.

Equipment List:

Location	Model	Unit Serial	Unit Type	Response Time
1-Phase UPS Systems				
12th and Imperial	SRT3000RMXLA	AS1828190430	UPS	8-Hour
12th and Imperial	SRT96RMBP	7S1824L02167	External Battery Pack	8-Hour
12th and Imperial	AP4453	5A1832T93239	ATS	8-Hour
24th Street	SRT3000RMXLA	AS1827293260	UPS	8-Hour
24th Street	SRT96RMBP	7S1828L02319	External Battery Pack	8-Hour
24th Street	AP4453	5A1832T93248	ATS	8-Hour
25th and Commercial	SRT3000RMXLA	AS1828190494	UPS	8-Hour
25th and Commercial	SRT96RMBP	7S1828L00745	External Battery Pack	8-Hour
25th and Commercial	AP4453	5A1832T21706	ATS	8-Hour
32nd and Commercial	SRT3000RMXLA	AS1828190482	UPS	8-Hour
32nd and Commercial	SRT96RMBP	7S1829L01640	External Battery Pack	8-Hour
32nd and Commercial	AP4453	5A1832T21690	ATS	8-Hour
47th Street	SRT3000RMXLA	AS1827293282	UPS	8-Hour
47th Street	SRT96RMBP	7S1828L00706	External Battery Pack	8-Hour
47th Street	AP4453	5A1832T93234	ATS	8-Hour
5th Ave	SRT3000RMXLA	AS1827293265	UPS	8-Hour
5th Ave	SRT96RMBP	7S1825L00064	External Battery Pack	8-Hour
5th Ave	AP4453	5A1832T21700	ATS	8-Hour
70th Street	SRT3000RMXLA	AS1828190438	UPS	8-Hour
70th Street	SRT96RMBP	7S1825L00479	External Battery Pack	8-Hour
70th Street	AP4453	5A1832T21698	ATS	8-Hour
8th Street	SRT3000RMXLA	AS1827293280	UPS	8-Hour
8th Street	SRT96RMBP	7S1828L00700	External Battery Pack	8-Hour
8th Street	AP4453	5A1832T93250	ATS	8-Hour
Alvarado Medical Center	SRT3000RMXLA	AS1828190440	UPS	8-Hour
Alvarado Medical Center	SRT96RMBP	7S1825L00483	External Battery Pack	8-Hour
Alvarado Medical Center	AP4453	5A1832T21693	ATS	8-Hour
Amaya Drive	SRT3000RMXLA	AS1827293294	UPS	8-Hour
Amaya Drive	SRT96RMBP	7S1828L02314	External Battery Pack	8-Hour
Amaya Drive	AP4453	5A1832T21697	ATS	8-Hour
American Plaza	SRT3000RMXLA	AS1828190485	UPS	8-Hour
American Plaza	SRT96RMBP	7S1828L00707	External Battery Pack	8-Hour
American Plaza	AP4453	5A1832T93242	ATS	8-Hour
Arnele Avenue	SRT3000RMXLA	AS1827293308	UPS	8-Hour
Arnele Avenue	SRT96RMBP	7S1825L00481	External Battery Pack	8-Hour
Arnele Avenue	AP4453	5A1832T93243	ATS	8-Hour

B Building IDF	SMT3000RM2U	JS1110012191	UPS	8-Hour
B Building IDF	SURT192RMXLBP 3U	8S1413F15529	UPS	8-Hour
B Building IDF	SURT192RMXLBP 3U	8S1413F15518	External Battery Pack	8-Hour
B Building IDF	SURTA3000RMXL3 U	QS1352140686	External Battery Pack	8-Hour
B Building Managers Office	SURTA1500RMXL2 U	QS1343342083	UPS	8-Hour
B Building Revenue Room	SMT2200	IS1128009468	UPS	8-Hour
Balboa Ave	SRT3000RMXLA	AS1928193330	UPS	8-Hour
Balboa Ave	SRT96RMBP	7S2032L00872	External Battery Pack	8-Hour
Balboa Ave	SRT96RMBP	7S2032L00842	External Battery Pack	8-Hour
Balboa Ave	AP4453	5A1926T32794	ATS	8-Hour
Barrio Logan	SRT3000RMXLA	AS1828190492	UPS	8-Hour
Barrio Logan	SRT96RMBP	7S1828L02318	External Battery Pack	8-Hour
Barrio Logan	AP4453	5A1832T93286	ATS	8-Hour
Beyer Blvd	SRT3000RMXLA	AS1827293292	UPS	8-Hour
Beyer Blvd	SRT96RMBP	7S1828L00733	External Battery Pack	8-Hour
Beyer Blvd	AP4453	5A1832T93226	ATS	8-Hour
Boulevard Transit Plaza	SMX3000RMLV2U	AS1723160306	UPS	8-Hour
Boulevard Transit Plaza	SMX3000RMLV2U NC	AS1738160621	UPS	8-Hour
Boulevard Transit Plaza	SMX120RMBP2U	7A1729L45956	External Battery Pack	8-Hour
Boulevard Transit Plaza	SMX120RMBP2U	7A1730L45656	External Battery Pack	8-Hour
Boulevard Transit Plaza	SMX120RMBP2U	7A1730L45655	External Battery Pack	8-Hour
Boulevard Transit Plaza	SMX120RMBP2U	7A1729L45955	External Battery Pack	8-Hour
C Building IDF	SMX2000RMLV2U NC	AS1727163149	UPS	8-Hour
City College	SRT3000RMXLA	AS1828190435	UPS	8-Hour
City College	SRT96RMBP	7S1825L00478	External Battery Pack	8-Hour
City College	AP4453	5A1832T21680	ATS	8-Hour
Civic Center	SRT3000RMXLA	AS1828190432	UPS	8-Hour
Civic Center	SRT96RMBP	7S1824L02158	External Battery Pack	8-Hour
Civic Center	AP4453	5A1832T93225	ATS	8-Hour
Clairemont Drive	SRT3000RMXLA	AS2050292311	UPS	8-Hour
Clairemont Drive	SRT96RMBP	7S2032L00844	External Battery Pack	8-Hour
Clairemont Drive	SRT96RMBP	7S2032L00871	External Battery Pack	8-Hour
Clairemont Drive	AP4453	5A2223T00173	ATS	8-Hour
Convention Center	SRT3000RMXLA	AS1828190434	UPS	8-Hour
Convention Center	SRT96RMBP	7S1828L00573	External Battery Pack	8-Hour
Convention Center	AP4453	5A2252T51802	ATS	8-Hour
Copley Building IDF	SUA2200RM2U	JS1048001493	UPS	8-Hour
Copley Building MDF	SUA2200RM2U	JS1027004713	UPS	8-Hour
Copley Building MDF	SUA2200RM2U	JS1046001491	UPS	8-Hour
Copley Building MDF	SUA2200RM2U	JS1046001497	UPS	8-Hour
Courthouse Station	SRT3000RMXLA	AS1827293289	UPS	8-Hour
Courthouse Station	SRT96RMBP	7S1829L01644	External Battery Pack	8-Hour
Courthouse Station	AP4453	5A1832T93246	ATS	8-Hour
D Building	SMT1500	AS1134211506	UPS	8-Hour

Del Lago	SMT2200	IS1212002698	UPS	8-Hour
E Street	SRT3000RMXLA	AS1827293284	UPS	8-Hour
E Street	SRT96RMBP	7S1828L02313	External Battery Pack	8-Hour
E Street	AP4453	5A1832T93237	ATS	8-Hour
East County Admin Building - Datacenter	SMT3000RM2U	AS1626261539	UPS	8-Hour
East County Admin Building - Datacenter	SMT3000RM2U	AS1539141387	UPS	8-Hour
East County Admin Building - Datacenter	SMT3000RM2U	AS1613162421	UPS	8-Hour
East County Admin Building - Datacenter	SMT3000RM2U	AS1622162824	UPS	8-Hour
East Palomar Transit Station	SMX3000RMLV2U	AS1637164781	UPS	8-Hour
East Palomar Transit Station	SMX120RMBP2U	7A1634L13018	External Battery Pack	8-Hour
East Palomar Transit Station	SMX120RMBP2U	7A1634L13019	External Battery Pack	8-Hour
El Cajon TransDev	SMT3000RM2U	AS1539141387	UPS	8-Hour
El Cajon TransDev	SMT3000RM2U	AS1626261539	UPS	8-Hour
El Cajon TransDev	SMT3000RM2U	AS1723363554	UPS	8-Hour
El Cajon TransDev	SMT3000RM2U	AS1726254029	UPS	8-Hour
El Cajon Transit Center	SRT3000RMXLA	AS1828190436	UPS	8-Hour
El Cajon Transit Center	SRT96RMBP	7S1824L02121	External Battery Pack	8-Hour
El Cajon Transit Center	AP4453	5A1832T93220	ATS	8-Hour
Encanto/62nd Street	SRT3000RMXLA	AS1827293293	UPS	8-Hour
Encanto/62nd Street	SRT96RMBP	7S1828L02312	External Battery Pack	8-Hour
Encanto/62nd Street	AP4453	5A1832T21673	ATS	8-Hour
Euclid Ave	SRT3000RMXLA	AS1827293297	UPS	8-Hour
Euclid Ave	SRT96RMBP	7S1825L00087	External Battery Pack	8-Hour
Euclid Ave	AP4453	5A1832T93272	ATS	8-Hour
Fashion Valley	SRT3000RMXLA	AS1827293278	UPS	8-Hour
Fashion Valley	SRT96RMBP	7S1829L01645	External Battery Pack	8-Hour
Fashion Valley	AP4453	5A1832T93275	ATS	8-Hour
Fenton	SRT3000RMXLA	AS1828190433	UPS	8-Hour
Fenton	SRT96RMBP	7S1828L02317	External Battery Pack	8-Hour
Fenton	AP4453	5A1832T93233	ATS	8-Hour
Gaslamp Quarter	SRT3000RMXLA	AS1827293270	UPS	8-Hour
Gaslamp Quarter	SRT96RMBP	7S1825L00113	External Battery Pack	8-Hour
Gaslamp Quarter	AP4453	5A1832T93229	ATS	8-Hour
Gillespie Field	SRT3000RMXLA	AS1827293275	UPS	8-Hour
Gillespie Field	SRT96RMBP	7S1825L00073	External Battery Pack	8-Hour
Gillespie Field	AP4453	5A1832T21675	ATS	8-Hour
Grantville	SRT3000RMXLA	AS1828190471	UPS	8-Hour
Grantville	SRT96RMBP	7S1825L00068	External Battery Pack	8-Hour
Grantville	AP4453	5A1832T21704	ATS	8-Hour
Grossmont	SRT3000RMXLA	AS1828190437	UPS	8-Hour
Grossmont	SRT96RMBP	7S1825L00482	External Battery Pack	8-Hour
Grossmont	AP4453	5A1832T21696	ATS	8-Hour
H Street	SRT3000RMXLA	AS1827293302	UPS	8-Hour
H Street	SRT96RMBP	7S1828L00674	External Battery Pack	8-Hour
H Street	AP4453	5A1832T93236	ATS	8-Hour
Harborside	SRT3000RMXLA	AS1828190492	UPS	8-Hour
Harborside	SRT96RMBP	7S1828L02318	External Battery Pack	8-Hour
Harborside	AP4453	5A1832T93286	ATS	8-Hour

Hazard	SRT3000RMXLA	AS1828190486	UPS	8-Hour
Hazard	SRT96RMBP	7S1829L01643	External Battery Pack	8-Hour
Hazard	AP4453	5A1832T93240	ATS	8-Hour
Heritage Station	SRT3000RMXLA	AS1827293321	UPS	8-Hour
Heritage Station	SRT96RMBP	7S1828L00679	External Battery Pack	8-Hour
Heritage Station	AP4453	5A1832T21692	ATS	8-Hour
IAD Data Center	SMT1500RM2U	AS1318220707	UPS	4-Hour
IAD Data Center	SMT2200RM2U	JS1114013291	UPS	4-Hour
IAD Data Center	SMT3000RM2U	IS1136000147	UPS	4-Hour
IAD Data Center	SMT3000RM2U	IS1136000148	UPS	4-Hour
IAD Data Center	SMX3000RMLV2UNC	AS1824254816	UPS	4-Hour
IAD Data Center	SUA5000RMT5U	IS1125004596	UPS	4-Hour
IAD Data Center	SURT5000RMXLT	QS1429271613	UPS	4-Hour
IAD Data Center	SURT5000XLT	NS0632015670	UPS	4-Hour
IAD Data Center	U-SURTD5000XLT	NS0647032018	UPS	4-Hour
IAD Data Center	SURT15KRMXLT	IS1248004979	UPS	4-Hour
IAD Data Center	AP9626	ZS1130024151	Transformer	4-Hour
IAD Data Center	AP9627	na-761	Transformer	4-Hour
IAD Data Center	SURT192RMXLBP2	IS1249002343	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX3000RMLV2U	AS1701261822	UPS	4-Hour
IAD Radio Room MDF	SMX3000RMLV2U	AS1627160587	UPS	4-Hour
IAD Radio Room MDF	SMX3000RMLV2U	AS1545142433	UPS	4-Hour
IAD Radio Room MDF	SMX3000RMLV2U	AS1644264262	UPS	4-Hour
IAD Radio Room MDF	SRT6KRMXLT	AS2126170864	UPS	4-Hour
IAD Radio Room MDF	SYA16K16RMP	QD1415260365	UPS	4-Hour
IAD Radio Room MDF	SRT5KTF	7S2122L00833	Transformer	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1612L02486	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1638L40368	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1541L08167	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1704L31809	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1704L31808	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1640L23985	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1612L17792	External Battery Pack	4-Hour
IAD Radio Room MDF	SMX120RMBP2U	7A1537L32400	External Battery Pack	4-Hour
IAD RAM IDF	SMX2000RMLV2UNC	AS1649264568	UPS	4-Hour
IAD Service Lane IDF	SMX3000RMLV2U	AS1815360478	UPS	4-Hour
IAD Service Lane IDF	SMX120RMBP2U	7A1815L44511	External Battery Pack	4-Hour
IAD Service Lane IDF	SBP3000RM2U	UA1723000130	ATS	4-Hour
Iris Ave	SRT3000RMXLA	AS1827293309	UPS	8-Hour
Iris Ave	SRT96RMBP	7S1828L02320	External Battery Pack	8-Hour
Iris Ave	AP4453	5A1832T93230	ATS	8-Hour
KMD Dispatch IDF	SMT1500	AS1134211496	UPS	8-Hour
KMD IDF East	SMX2000RMLV2UNC	AS1649264574	UPS	8-Hour
KMD IDF East	SRT3000RMXLA	AS1828294415	UPS	8-Hour
KMD IDF East	SRT96RMBP	7S1828L00682	External Battery Pack	8-Hour
KMD IDF East	AP4453	5A1832T21687	ATS	8-Hour

La Mesa Blvd	SRT3000RMXLA	AS1827293298	UPS	8-Hour
La Mesa Blvd	SRT96RMBP	7S1828L00575	External Battery Pack	8-Hour
La Mesa Blvd	AP4453	5A1832T21701	ATS	8-Hour
Lemon Grove Depot	SRT3000RMXLA	AS1828190468	UPS	8-Hour
Lemon Grove Depot	SRT96RMBP	7S1828L00576	External Battery Pack	8-Hour
Lemon Grove Depot	AP4453	5A1832T21705	ATS	8-Hour
Little Italy	SRT3000RMXLA	AS1827293283	UPS	8-Hour
Little Italy	SRT96RMBP	7S1828L00741	External Battery Pack	8-Hour
Little Italy	AP4453	5A1832T93227	ATS	8-Hour
Lomas Verdes	SRT3000RMXLA	AS1829294372	UPS	8-Hour
Lomas Verdes	SRT96RMBP	7S1828L00680	External Battery Pack	8-Hour
Lomas Verdes	AP4453	5A1832T93214	ATS	8-Hour
Massachusetts Ave	SRT3000RMXLA	AS1828190470	UPS	8-Hour
Massachusetts Ave	SRT96RMBP	7S1825L00110	External Battery Pack	8-Hour
Massachusetts Ave	AP4453	5A1832T93231	ATS	8-Hour
Middletown	SRT3000RMXLA	AS1827293258	UPS	8-Hour
Middletown	SRT96RMBP	7S1828L00748	External Battery Pack	8-Hour
Middletown	AP4453	5A1832T21694	ATS	8-Hour
Millenia Station	SMX120RMBP2U	7A1804L40075	UPS	8-Hour
Millenia Station	SMX120RMBP2U	na-483	External Battery Pack	8-Hour
Millenia Station	SMX3000RMLV2U	AS1815360476	External Battery Pack	8-Hour
Millenia Station	SBP3000RM2U	UA1817001296	ATS	8-Hour
Mills 10th Floor	SMT2200	IS1128002164	UPS	4-Hour
Mills 10th Floor	SMT3000RM2U	JS1110012187	UPS	4-Hour
Mills 10th Floor	SURT8000RMXLT	QS1244150685	UPS	4-Hour
Mills 10th Floor	AP9627	na-1072	Transformer	4-Hour
Mills 10th Floor	SURT192XLBP	IS0922002918	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	IS0922002918	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	NS0648018037	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	NS0721023320	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	NS0631028821	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	NS0547002358	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	NS0708009780	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	NS0746006640	External Battery Pack	4-Hour
Mills 10th Floor	SURT192XLBP	IS08300003670	External Battery Pack	4-Hour
Mills 8th Floor IDF	SUA1500	AS0442132150	UPS	4-Hour
Mills 9th Floor Storage	SMX2000RMLV2U NC	AS1649264570	UPS	4-Hour
Miramar College	SMX3000RMLV2U NC	AS1328246447	UPS	8-Hour
Miramar College	SMX3000RMLV2U NC	AS1333237555	UPS	8-Hour
Miramar College	SMX120RMBP2U	na-655	External Battery Pack	8-Hour
Miramar College	SMX120RMBP2U	na-656	External Battery Pack	8-Hour
Miramar College	SMX120RMBP2U	na-657	External Battery Pack	8-Hour

Miramar College	SMX120RMBP2U	na-658	External Battery Pack	8-Hour
Mission San Diego	SRT3000RMXLA	AS1828190429	UPS	8-Hour
Mission San Diego	SRT96RMBP	7S1824L02100	External Battery Pack	8-Hour
Mission San Diego	AP4453	5A1832T93262	ATS	8-Hour
Mission Valley Center	SRT3000RMXLA	AS1827293274	UPS	8-Hour
Mission Valley Center	SRT96RMBP	7S1828L00693	External Battery Pack	8-Hour
Mission Valley Center	AP4453	5A1832T21686	ATS	8-Hour
Morena / Linda Vista	SRT3000RMXLA	AS1827293279	UPS	8-Hour
Morena / Linda Vista	SRT96RMBP	7S1828L00749	External Battery Pack	8-Hour
Morena / Linda Vista	AP4453	5A1832T93228	ATS	8-Hour
OCC Datacenter	SUA2200RM2U	JS0703007721	UPS	4-Hour
OCC Datacenter	SUA3000RM2U	JS1104018801	UPS	4-Hour
OCC Datacenter	SURTA3000RMXL3U	QS1540240065	UPS	4-Hour
OCC Datacenter	GXT2-3000RT120	08289R1150AF091	UPS	4-Hour
OCC Datacenter	GXT2-6000RT208	09015R0038BW571	UPS	4-Hour
OCC Datacenter	SURT192RMXLBP3U	7S1545L02425	External Battery Pack	4-Hour
OCC Datacenter	SURT192RMXLBP3U	7S1545L02549	External Battery Pack	4-Hour
OCC MOW	SMT1500	AS1134311711	UPS	4-Hour
OCC Telephone Room	SMT1500	AS1134311709	UPS	4-Hour
Old Town Bunker	SRT3000RMXLA	AS2050292331	UPS	8-Hour
Old Town Bunker	SRT96RMBP	7S2102L03445	External Battery Pack	8-Hour
Old Town Bunker	SRT96RMBP	7S2102L03265	External Battery Pack	8-Hour
Old Town Bunker	AP4453	5A2050T57627	ATS	8-Hour
Old Town West	SRT3000RMXLA	AS2245193067	UPS	8-Hour
Old Town West	SRT96RMBP	7S1824L02099	External Battery Pack	8-Hour
Old Town West	AP4453	5A1832T93257	ATS	8-Hour
Otay Mesa	SRT3000RMXLA	AS1827293323	UPS	8-Hour
Otay Mesa	SRT96RMBP	7A1828L00578	External Battery Pack	8-Hour
Otay Mesa	AP4453	5A1832T93283	ATS	8-Hour
Otay Ranch	SRT3000RMXLA	na-473	UPS	8-Hour
Otay Ranch	SRT96RMBP	na-474	External Battery Pack	8-Hour
Otay Ranch	AP4453	na-475	ATS	8-Hour
Pacific Fleet	SRT3000RMXLA	AS1827293281	UPS	8-Hour
Pacific Fleet	SRT96RMBP	7S1828L02323	External Battery Pack	8-Hour
Pacific Fleet	AP4453	5A1832T21671	ATS	8-Hour
Palm Ave	SRT3000RMXLA	AS1827293285	UPS	8-Hour
Palm Ave	SRT96RMBP	7S1828L02322	External Battery Pack	8-Hour
Palm Ave	AP4453	5A1832T93241	ATS	8-Hour
Palomar Street	SRT3000RMXLA	AS1827293321	UPS	8-Hour
Palomar Street	SRT96RMBP	7S1829L01653	External Battery Pack	8-Hour
Palomar Street	AP4453	5A1832T21707	ATS	8-Hour
Park and Market	SRT3000RMXLA	AS1828190490	UPS	8-Hour
Park and Market	SRT96RMBP	7S1828L00699	External Battery Pack	8-Hour
Park and Market	AP4453	5A1832T93213	ATS	8-Hour
Rancho Bernardo	SMT2200	IS1212002700	UPS	8-Hour

Rio Vista	SRT3000RMXLA	AS1828190439	UPS	8-Hour
Rio Vista	SRT96RMBP	7S1828L00573-2	External Battery Pack	8-Hour
Rio Vista	AP4453	5A1832T21672	ATS	8-Hour
Ruffin Road (Kaiser I-15)	SMX3000LV	AS1432141164	UPS	8-Hour
Sabre Springs	SMX3000RMLV2UNC	AS1338236726	UPS	8-Hour
Sabre Springs	SMX120RMBP2U	na-661	External Battery Pack	8-Hour
San Ysidro	SMX3000LV	AS1332137146	UPS	8-Hour
San Ysidro	SMX120BP	7A1505L35786	External Battery Pack	8-Hour
San Ysidro	AP4453	5A1832T93253	ATS	8-Hour
Santa Fe	SMX3000RMLV2U	na-1535	UPS	8-Hour
Santa Fe	SMX3000RMLV2U	IS1239000143	UPS	8-Hour
Santa Fe	SMX120RMBP2U	na-1533	External Battery Pack	8-Hour
Santa Fe	SMX120RMBP2U	na-1534	External Battery Pack	8-Hour
Santa Fe	SMX120RMBP2U	na-1536	External Battery Pack	8-Hour
Santa Fe	SMX120RMBP2U	na-1537	External Battery Pack	8-Hour
Santa Fe (On Rail)	SRT3000RMXLA	AS1827293272	UPS	8-Hour
Santa Fe (On Rail)	SRT96RMBP	7S1828L00678	External Battery Pack	8-Hour
Santa Fe (On Rail)	AP4453	5A1832T21691	ATS	8-Hour
Santa Venetia	SRT3000RMXLA	AS1827293290	UPS	8-Hour
Santa Venetia	SRT96RMBP	7S1825L00116	External Battery Pack	8-Hour
Santa Venetia	AP4453	5A1832T93245	ATS	8-Hour
Santee Town Center	SRT3000RMXLA	AS1827293301	UPS	8-Hour
Santee Town Center	SRT96RMBP	7S1828L00688	External Battery Pack	8-Hour
Santee Town Center	AP4453	5A1832T93238	ATS	8-Hour
SDSU	SRT3000RMXLA	AS1827293299	UPS	8-Hour
SDSU	SRT96RMBP	7S1828L00580	External Battery Pack	8-Hour
SDSU	AP4453	5A1832T21699	ATS	8-Hour
Seaport Village	SRT3000RMXLA	AS1828190428	UPS	8-Hour
Seaport Village	SRT96RMBP	7S1824L02132	External Battery Pack	8-Hour
Seaport Village	AP4453	5A1832T93249	ATS	8-Hour
Southbay Main 3650	SMT3000RM2U	AS1414143663	UPS	8-Hour
Southbay Main 3650	SMT3000RM2U	AS1414143638	UPS	8-Hour
Southbay Main 3650	SMT3000RM2U	na-1128	UPS	8-Hour
Southbay Main 3650a	SMX2000RMLV2UNC	AS1649264573	UPS	8-Hour
Southbay Main Datacenter	SMT3000RM2U	AS1337140673	UPS	8-Hour
Southbay Main Datacenter	SMT3000RM2U	AS1337140671	UPS	8-Hour
Southbay Main Datacenter	SMT3000RM2U	na-1158	UPS	8-Hour
Spring Street	SRT3000RMXLA	AS1827293291	UPS	8-Hour
Spring Street	SRT96RMBP	7S1828L02321	External Battery Pack	8-Hour
Spring Street	AP4453	5A1832T93247	ATS	8-Hour
Stadium	SRT3000RMXLA	AQ1910290880	UPS	8-Hour
Stadium	SRT96RMBP	7S1828L00579	External Battery Pack	8-Hour
Stadium	AP4453	5A1832T21670	ATS	8-Hour
Tecolote Road	SRT3000RMXLA	AS1930393181	UPS	8-Hour
Tecolote Road	SRT96RMBP	7S2032L00832	External Battery Pack	8-Hour

Tecolote Road	SRT96RMBP	7S2032L00843	External Battery Pack	8-Hour
Tecolote Road	AP4453	5A1926T32786	ATS	8-Hour
University Ave Transit Center	SMX3000RMLV2UNC	AS1338237693	UPS	8-Hour
University Ave Transit Center	SMX3000RMLV2UNC	AS1727163159	UPS	8-Hour
University Ave Transit Center	SMX120RMBP2U	7A1730L42195	External Battery Pack	8-Hour
University Ave Transit Center	SMX120RMBP2U	7A1730L42194	External Battery Pack	8-Hour
University Ave Transit Center	SMX120RMBP2U	7A1730L42197	External Battery Pack	8-Hour
University Ave Transit Center	SMX120RMBP2U	7A1730L42196	External Battery Pack	8-Hour
UTC	SMX3000LV	AS1434235857	UPS	8-Hour
UTC	SMX120BP	7A1609L05295	External Battery Pack	8-Hour
VA Medical Center	SRT3000RMXLA	AS1930393184	UPS	8-Hour
VA Medical Center	SRT96RMBP	7S2032L00828	External Battery Pack	8-Hour
VA Medical Center	SRT96RMBP	7S2032L00841	External Battery Pack	8-Hour
VA Medical Center	AP4453	5A1926T52270	ATS	8-Hour
Virginia Ave Transit Center	SMX2000RMLV2UNC	AS2135254032	UPS	8-Hour
Washington Street	SRT3000RMXLA	AS1827293264	UPS	8-Hour
Washington Street	SRT96RMBP	7S1828L00696	External Battery Pack	8-Hour
Washington Street	AP4453	5A1832T21695	ATS	8-Hour
Wright Street Yard	SMT1500RM2U	AS2021130148	UPS	8-Hour
Yard Tower	SUA2200RM2U	YS0402124403	UPS	8-Hour
3-Phase UPS Systems				
Executive Drive Trolley Station	GVSUPS25KFS	ID2036012016	UPS	8-Hour
Nobel Drive Transit Center	GVSUPS25KFS	ID1952001814	UPS	8-Hour
Pepper Canyon Trolley Station (UC San Diego Central Campus)	GVSUPS25KFS	ID2020003960	UPS	8-Hour
University Town Center Trolley Station (UTC)	GVSUPS25KFS	ID2005006844	UPS	8-Hour
Voigt Drive Trolley Station (UC San Diego Health La Jolla)	GVSUPS25KFS	ID2001005202	UPS	8-Hour

Are you Satisfied?

Click HERE to Rate your Quotation Experience.

General Conditions

Date			
Quote validity:	6/30/2025		
Contract Start Date:	7/15/2025	**Contract End Date:**	7/14/2030
Billing detail			
Billing Profile:	In-Full	**Billing Schedule:**	TBD
Invoice Option:	Not Applicable		
1st Invoice Date:	TBD		
Payment term:	NET 30 DAYS		
Bill to address:	SAN DIEGO METROPOLITAN TRANSIT SYSTEM ACCOUNTING DEPARTMENT SAN DIEGO CA, 92101 UNITED STATES		

Terms and Conditions

ANY ORDER PLACED PURSUANT TO THIS QUOTATION SHALL BE GOVERNED SOLELY BY THE TERMS AND CONDITIONS SET FORTH AT
https://download.schneider-electric.com/files?p_Doc_Ref=SPD_CFOT-AHJQSX_EN

Signature

Provider	Customer « Review & Sign »
SCHNEIDER ELECTRIC IT CORP.	San Diego Metropolitan Transit System
Signature: _____	Signature: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

Metropolitan Transit System

Agenda Item No. 18

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

The San Diego Metropolitan Transit System (MTS) Board Policy No. 13 Conflict of Interest Regarding Service Contracts – Policy Revision

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors adopt the proposed revisions to MTS Board Policy No. 13 Conflict of Interest Regarding Service Contracts (Attachment A).

Budget Impact

None with this action.

DISCUSSION:

This year, MTS plans to start utilizing the design-build procurement method for certain transit capital projects as authorized under California Public Contract Code Section 22162 *et seq.* Design-build is a construction procurement process in which both the design and construction of a project are procured from a single entity. One of the requirements for design-build projects is that a public agency establish a written conflict of interest policy for design-build projects.

MTS Board Policy No. 13 - Conflict of Interest Regarding Service Contracts (Policy No. 13) establishes the procedures regarding potential and actual conflict of interests for service contracts, specifically those involving architectural and engineering consultants. This Policy has not had a substantive review by staff since 2006. MTS legal counsel conducted a comprehensive review of Policy No. 13 and developed proposed revisions that expand Policy No. 13 to apply to not only architectural and engineering conflict of interests, but all third-party contracts, including design-build.

Therefore, staff recommends that the MTS Board of Directors adopt the proposed revisions to MTS Board Policy No. 13 Conflict of Interest Regarding Service Contracts (Attachment A).

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachments: A. Proposed Revisions to Policy No. 13 - Clean version
B. Proposed Revisions to Policy No. 13 - Track Changes

Metropolitan Transit System

Policies and Procedures No. 13

Board Approval: 6/26/2025

SUBJECT:

CONFLICT OF INTEREST POLICY FOR CONSULTANTS AND CONTRACTORS

PURPOSE:

To establish procedures regarding potential and actual conflicts of interest for consultants and contractors working on MTS projects, including design-build projects.

POLICY:

13.1 Purpose. Local, state, and federal law include statutes, regulations, and rules that prohibit "conflicts of interest" to ensure that decisions are made impartially, based on organizational interests, and not influenced by personal interests or relationships of the employees or contractors hired to assist a public agency in making decisions. Disclosure of potential conflicts of interest is necessary to evaluate if the conflict can be mitigated by reasonable measures, or if the conflict would make an individual or entity ineligible to work on a particular contract for MTS.

13.2 Applicability. This policy applies to all consultants and contractors (referred to herein as a "firm") that have entered into or wish to enter into contracts with MTS to perform services. This policy is supplemental to MTS's Conflict of Interest Code and does not supersede or modify any requirements in that Conflict of Interest Code.

13.3 Policy Prohibiting Conflicts of Interest. A firm is eligible for award of contracts by MTS so long as the firm does not have an actual, potential, or apparent conflict of interest.

Conflicts of interest may be prohibited by statute (e.g. Government Code Section 1090 and the Political Reform Act) or by regulation (e.g. organizational conflicts of interest).

13.3.1 Statutory conflicts of interest arise when a firm participates in making an MTS contract in which it has a financial interest and no exceptions applies. Statutory conflicts of interest are governed by statute, as well as related case law and regulations.

13.3.2 Organizational conflicts of interest are created by circumstances arising out of consultants' or contractors' existing or past activities, business or financial interests, familial relationships, contractual relationships, or organizational structure (e.g., parent entities, subsidiaries, affiliates) that result in:

13.3.2.1 impairment or potential impairment of consultants' or contractors' ability to render impartial assistance or advice to MTS;

13.3.2.2 impairment or potential impairment of consultants’ or contractors’ objectivity in performing work for MTS;

13.3.2.3 an unfair competitive advantage for any proposer with respect to MTS’s procurement (including, but not limited to, through access to nonpublic information or assisting MTS in the preparation of a Request for Qualifications (RFQ), Request for Information (RFI), Request for Proposals (RFP), Invitation for Bids (IFB), or the resultant contract); or a perception or appearance of impropriety or unfair competitive advantage with respect to any of MTS’s procurements or contracts (irrespective of whether such perception is accurate).

13.4 Examples of Potential Conflicts of Interest. Prohibited conflicts of interest include, but are not limited to, the following situations:

13.4.1 *Design-Bid-Build Projects*. Any firm that provides design services for a project will be ineligible for award of a contract to construct the improvements which are the subject of the design services, unless otherwise permitted by law. This does not apply to a separate, follow-on contract to provide design services during construction for the subject project.

13.4.2 *Construction Management Services*.

13.4.2.1 Any firm that provides design services for a project will be ineligible for award of any contract to provide

construction management services for the specific project for which design services were provided unless otherwise permitted by law.

13.4.2.2 Any firm that provides construction management services for a project will be ineligible for award of a construction contract for which construction management services were or will be provided unless otherwise permitted by law.

13.4.3 *Design-Build Projects*.

13.4.3.1 A firm that is or has acted as MTS's general engineering or architectural consultant for a design-build project.

13.4.3.1.1 However, a sub-consultant of the general engineering or architectural consultant that has not yet performed work on the contract to provide services for the design-build project may participate as a Proposer or join a design-build team if the Proposer terminates the agreement to provide work and provides no work for the District's general engineering or architectural consultant on the design-build project.

13.4.3.2 A firm has conducted preliminary design services for the design-build project such as conceptual layouts, preliminary design, or preparation of bridging documents.

13.4.3.3 A firm performed design work related to the design-build project for other stakeholders in the design-build project.

13.4.3.4 A firm performed design work on a previous contract that specifically excludes the firm from participating as a proposer or joining any design-build team for the design-build project.

13.4.4 *Applicable to All Projects and Contracts*.

13.4.4.1 A firm has assisted or is assisting MTS in the management of the project or contract, including the preparation of the RFP, evaluation criteria, or any other aspect of the procurement.

13.4.4.2 A firm is under contract with any other entity or stakeholder to perform oversight of the project.

13.4.4.3 Any circumstances that would violate California Government Code Sections 1090 et seq. (contractual conflicts).

13.4.4.4 A firm that is or has acted as MTS's general engineering or architectural consultant shall not participate in the review and analysis of or render opinions regarding the firm's own work performed on an MTS project.

13.5 Other Conflict of Interest Rules.

13.5.1 MTS may be required to comply with requirements and regulations applicable to federally funded procurements and contracts. Nothing in this policy is intended to limit, modify or otherwise alter the effect of other relevant federal, state, or local regulations, statutes or rules.

13.5.2 Consultants responsible for preparing documents under the California Environmental Quality Act (CEQA) are required to comply with all state laws and regulations applicable to such services, including requirements relating to organizational conflicts of interest. For federally funded projects subject to NEPA compliance, consultants involved in the preparation of environmental assessments or environmental impact statements must submit a disclosure statement to the lead agency that specifies any financial or other interests in the outcome of the project. (See 40 CFR §1506.5(b)(4).)

13.6 Procedure for Identifying Potential Conflicts of Interest.

13.6.1 *Disclosure Obligations Prior to Contract Award*. During the solicitation or procurement process, firms having a conflict must immediately make a full written disclosure of the actual, perceived, or potential conflict to the contract administrator for the project, and shall have a continuing obligation to do so until they are no longer a proposer on the pending solicitation. If a firm determines that a potential conflict of interest exists, the firm's disclosure will not necessarily disqualify the firm from being awarded a contract. The firm shall submit proposed measures to avoid, neutralize, or mitigate all potential or actual conflicts. MTS, at its sole discretion, shall determine whether an actual or potential conflict of interest, or the appearance of any such conflict of interest, exists and whether the proposed measures are sufficient to overcome the actual,

perceived, or potential conflict and whether the firm may continue with the procurement process.

13.6.2 *Disclosure Obligations After Contract Award*.

13.6.2.1 After a contract has been awarded, the successful proposer to whom the contract is awarded (Contractor) has an ongoing obligation to monitor and disclose actual, perceived, or potential conflicts of interest. If an actual, perceived, or potential conflict of interest is discovered after the contract has been awarded, the Contractor must make an immediate and full written disclosure to MTS that includes a description of the action that the Contractor has taken or proposes to take to avoid or mitigate the conflict. MTS, in its sole discretion, shall determine whether an actual or potential conflict of interest, or the appearance of any such conflict of interest, exists and whether the proposed measures are sufficient to overcome the actual, perceived, or potential conflict. During the pendency of such evaluation, MTS reserves the right to suspend work under the contract without obligation, responsibility, or liability to reimburse all or part of the costs incurred or alleged to have been incurred by the Contractor.

13.6.2.2 If an actual, perceived, or potential conflict of interest is determined to exist and the Contractor was aware of the actual, perceived, or potential conflict of interest prior to award of the contract and did not disclose the conflict, MTS may terminate the contract. If a conflict of interest arises after the contract award and the Contractor's proposed measures to avoid or mitigate the conflict are determined by MTS to be inadequate to protect MTS, MTS may terminate the contract. If the contract is terminated, MTS assumes no obligation, responsibility or liability to reimburse all or part of the costs incurred or alleged to have been incurred by the Contractor, and MTS shall be entitled to pursue any and all appropriate legal remedies.

13.6.3 A “Notice of Potential for Conflict of Interest” shall be included within the procurement for services issued by MTS. The notice shall be the policy of the Board as listed herein. This policy shall be incorporated by reference into all contracts executed by MTS.

13.6.4 If there is any doubt by a firm regarding a potential conflict of interest for a specific project or function, MTS General Counsel will, upon written request, provide a written ruling.

Original Policy approved on 7/28/80.
Policy revised on 9/15/81.
Policy revised on 10/5/84.
Policy revised on 11/9/89.
Policy revised on 7/26/90.
Policy revised on 2/27/92.
Policy revised on 9/10/92.
Policy revised on 5/27/93.
Policy revised on 6/15/94.
Policy revised on 8/10/95.
Policy revised on 3/14/96.
Policy revised on 5/8/97.
Policy revised on 3/25/99.
Policy revised on 11/9/00.
Policy revised on 12/14/00.
Policy revised on 1/10/02.
Policy revised on 2/14/02.
Policy revised/renumbered on 2/12/04.
Policy repealed in part/revised on 6/22/06.
Policy revised on 6/26/2025

Metropolitan Transit System

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San Diego, CA 92101-7490
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Policies and Procedures No. 13

SUBJECT: Board Approval and Repealed in Part: : 6/22/0626/2025

SUBJECT: CONFLICTS

CONFLICT OF INTEREST REGARDING SERVICE CONTRACTSPOLICY FOR CONSULTANTS AND CONTRACTORS

PURPOSE:

To establish procedures regarding potential and actual conflicts of interest regarding service contractsfor consultants and contractors working on MTS projects, including design-build projects.

POLICY:

13.1 13.1 Purpose. Local, state, and federal law include statutes, regulations, and rules that prohibit "conflicts of interest" to ensure that decisions are made impartially, based on organizational interests, and not influenced by personal interests or relationships of the employees or contractors hired to assist a public agency in making decisions. Disclosure of potential conflicts of interest is necessary to evaluate if the conflict can be mitigated by reasonable measures, or if the conflict would make an individual or entity ineligible to work on a particular contract for MTS.

13.2 Applicability. This policy applies to all consultants and contractors (referred to herein as a "firm") that have entered into or wish to enter into contracts with MTS to perform services. This policy is supplemental to MTS's Conflict of Interest Code and does not supersede or modify any requirements in that Conflict of Interest Code.

Policy Prohibiting Conflicts of Interest

13.3 13.1.1 . A consultantfirm is eligible for award of service contracts by MTS, San Diego Trolley, Inc. (SDTI), and San Diego Transit Corporation (SDTC), hereinafter

~~referred to as "the Agencies"~~ so long as the ~~contract in question~~firm does not ~~create~~have an actual, potential, or apparent conflict of interest. ~~A~~

Conflicts of interest may be prohibited ~~conflict of interest exists~~by statute (e.g. Government Code Section 1090 and the Political Reform Act) or by regulation (e.g. organizational conflicts of interest).

13.3.1 Statutory conflicts of interest arise when a firm ~~is or may be unable~~participates in making an MTS contract in which it has a financial interest and no exceptions applies. Statutory conflicts of interest are governed by statute, as well as related case law and regulations.

13.3.2 Organizational conflicts of interest are created by circumstances arising out of consultants' or contractors' existing or past activities, business or financial interests, familial relationships, contractual relationships, or organizational structure (e.g., parent entities, subsidiaries, affiliates) that result in:

13.3.2.1 impairment or potential impairment of consultants' or contractors' ability to render impartial~~, objective~~ assistance or advice to ~~the Agencies or where a firm would receive~~ MTS;

13.3.2.2 impairment or potential impairment of consultants' or contractors' objectivity in performing work for MTS;

13.3.2.3 an unfair competitive advantage~~.~~ for any proposer with respect to MTS's procurement (including, but not limited to, through access to nonpublic information or assisting MTS in the preparation of a Request for Qualifications (RFQ), Request for Information (RFI), Request for Proposals (RFP), Invitation for Bids (IFB), or the resultant contract); or a perception or appearance of impropriety or unfair competitive advantage with respect to any of MTS's procurements or contracts (irrespective of whether such perception is accurate).

13.4 Examples of Potential Conflicts of Interest. Prohibited conflicts of interest include, but are not limited to, the following situations:

13.4.1 *Design-Bid-Build Projects*. Any firm that provides design services ~~to the Agencies~~ for a project will be ineligible for award of a ~~construction~~ contract to construct the improvements~~,~~ which are the subject of the design services, unless otherwise ~~provided for by law.~~

permitted by law. This does not apply to a separate, follow-on

contract to provide design services during construction for the subject project.

13.4.2 *Construction Management Services*.

13.4.2.1 Any firm that provides design services ~~to the Agencies~~for a project will be ineligible for award of any contract to provide construction management services ~~resulting from~~for the specific project for which design services were provided unless otherwise ~~provided for~~permitted by law.

13.4.2.2 Any firm that provides construction management services ~~to the Agencies~~for a project will be ineligible for award of a construction contract for which construction management services were or will be provided unless otherwise ~~provided for~~permitted by law.

~~13.1.2 General consultants or subconsultant firms may provide services on other Agency projects. A consultant shall not, however, participate in the review and analysis of or render opinions regarding its work performed on other Agency projects or as limited in Section 13.1.1 above. Unless otherwise defined by the Chief Executive Officer, a general consultant is a consultant whose procurement is typically for a two-year period with 3 one-year option extensions to provide services as needed from time to time on a work order basis rather than for one specific predefined project. General consultants support staff in managing other Agency consultants. Examples of general consultants are the general engineering consultant, the general construction consultants, the general right-of-way consultant, the general planning consultant, and the general environmental consultant. General consultants are prime contractors to the Agencies. Subconsultants to general Consultants are not classified as General consultants. General Consultant procurements are identified as such during the procurement process.~~

13.4.3 *Design-Build Projects*.

13.4.3.1 A firm that is or has acted as MTS's general engineering or architectural consultant for a design-build project.

13.4.3.1.1 However, a sub-consultant of the general engineering or architectural consultant that has not yet performed work on the contract to provide services for the design-build project may participate as a Proposer or join a design-build team if the Proposer terminates the agreement to provide work and provides no work for the District's general engineering or architectural consultant on the design-build project.

13.4.3.2 A firm has conducted preliminary design services for the design-build project such as conceptual layouts, preliminary design, or preparation of bridging documents.

13.4.3.3 A firm performed design work related to the design-build project for other stakeholders in the design-build project.

13.4.3.4 A firm performed design work on a previous contract that specifically excludes the firm from participating as a proposer or joining any design-build team for the design-build project.

13.4.4 *Applicable to All Projects and Contracts*.

13.4.4.1 A firm has assisted or is assisting MTS in the management of the project or contract, including the

preparation of the RFP, evaluation criteria, or any other aspect of the procurement.

13.4.4.2 A firm is under contract with any other entity or stakeholder to perform oversight of the project.

13.4.4.3 Any circumstances that would violate California Government Code Sections 1090 et seq. (contractual conflicts).

13.4.4.4 A firm that is or has acted as MTS's general engineering or architectural consultant shall not participate in the review and analysis of or render opinions regarding the firm's own work performed on an MTS project.

13.5 Other Conflict of Interest Rules.

13.5.1 MTS may be required to comply with requirements and regulations applicable to federally funded procurements and contracts. Nothing in this policy is intended to limit, modify or otherwise alter the effect of other relevant federal, state, or local regulations, statutes or rules.

13.5.2 Consultants responsible for preparing documents under the California Environmental Quality Act (CEQA) are required to comply with all state laws and regulations applicable to such services, including requirements relating to organizational conflicts of interest. For federally funded projects subject to NEPA compliance, consultants involved in the preparation of environmental assessments or environmental impact statements must submit a disclosure statement to the lead agency that specifies any financial or other interests in the outcome of the project. (See 40 CFR §1506.5(b)(4).)

13.6 Procedure for Identifying Potential Conflicts of Interest.

13.6.1 *Disclosure Obligations Prior to Contract Award*. During the solicitation or procurement process, firms having a conflict must immediately make a full written disclosure of the actual, perceived, or potential conflict to the contract administrator for the project, and shall have a continuing obligation to do so until they are no longer a proposer on the pending solicitation. If a firm determines that a potential conflict of interest exists, the firm's disclosure will not necessarily disqualify the firm from being awarded a contract. The firm shall submit proposed measures to avoid, neutralize, or mitigate all potential or actual conflicts. MTS, at its sole discretion, shall determine whether an actual or potential conflict of interest, or the appearance of any such conflict of interest, exists and whether

the proposed measures are sufficient to overcome the actual, perceived, or potential conflict and whether the firm may continue with the procurement process.

13.6.2 *Disclosure Obligations After Contract Award*.

13.6.2.1 After a contract has been awarded, the successful proposer to whom the contract is awarded (Contractor) has an ongoing obligation to monitor and disclose actual, perceived, or potential conflicts of interest. If an actual, perceived, or potential conflict of interest is discovered after the contract has been awarded, the Contractor must make an immediate and full written disclosure to MTS that includes a description of the action that the Contractor has taken or proposes to take to avoid or mitigate the conflict. MTS, in its sole discretion, shall determine whether an actual or potential conflict of interest, or the appearance of any such conflict of interest, exists and whether the proposed measures are sufficient to overcome the actual, perceived, or potential conflict. During the pendency of such evaluation, MTS reserves the right to suspend work under the contract without obligation, responsibility, or liability to reimburse all or part of the costs incurred or alleged to have been incurred by the Contractor.

13.6.2.2 If an actual, perceived, or potential conflict of interest is determined to exist and the Contractor was aware of the actual, perceived, or potential conflict of interest prior to award of the contract and did not disclose the conflict, MTS may terminate the contract. If a conflict of interest arises after the contract award and the Contractor's proposed measures to avoid or mitigate the conflict are determined by MTS to be inadequate to protect MTS, MTS may terminate the contract. If the contract is terminated, MTS assumes no obligation, responsibility or liability to reimburse all or part of the costs incurred or alleged to have been incurred by the Contractor, and MTS shall be entitled to pursue any and all appropriate legal remedies.

~~13.1.3~~13.6.3 A "Notice of Potential for Conflict of Interest" shall be included within the procurement for services issued by ~~the Agencies~~MTS. The notice shall be the policy of the Board as listed herein. ~~Any service agreement over $100,000 issued in accordance with this~~This policy shall ~~include or make~~be incorporated by reference ~~to the policy listed herein.~~
into all contracts executed by MTS.

~~13.1.4 A "firm" shall be defined as any company or family of companies where there is a single parent board of directors or staff of officers who can influence the policies and actions of the design company, construction management company, and the construction company.~~

~~13.1.5 "Ineligible" shall include the following definition:~~

~~Firms that are ineligible to provide services include the prime contractor for the services, subcontractors for portions of the services, and affiliates of either. An affiliate is a firm that is subject to the control of the same persons through joint ownership or otherwise.~~

~~13.1.6~~13.6.4 If there is any doubt by a firm regarding a potential conflict of interest for a specific project or function, MTS General Counsel will, upon written request, provide a written ruling. ~~This procedure is encouraged prior to submittal of a response to a procurement solicitation. In the event a conflict of interest is determined to exist, a written appeal may be made to the Chief Executive Officer. The Chief Executive Officer shall determine the adequacy of the appeal and make a subsequent final decision. No further appeal shall be considered.~~

~~13.1.7 The Chief Executive Officer shall review and, if appropriate, waive any actual, potential, or apparent conflict of interest that may exist or arise as a result of concurrent legal representation of clients whose interests may conflict.~~

~~DDarro/JGarde~~
~~POLICY.13.CONFLICTS OF INTEREST SERVICE CONTRACTS~~
~~7/24/06~~

Policy repealed in part/revised on 6/22/06.

Original Policy approved on 7/28/80.
Policy revised on 9/15/81.
Policy revised on 10/5/84.
Policy revised on 11/9/89.
Policy revised on 7/26/90.
Policy revised on 2/27/92.
Policy revised on 9/10/92.
Policy revised on 5/27/93.
Policy revised on 6/15/94.
Policy revised on 8/10/95.
Policy revised on 3/14/96.
Policy revised on 5/8/97.
Policy revised on 3/25/99.
Policy revised on 11/9/00.
Policy revised on 12/14/00.
Policy revised on 1/10/02.
Policy revised on 2/14/02.
Policy revised/renumbered on 2/12/04.

Metropolitan Transit System

Metropolitan Transit System

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Policy revised on 6/26/2025

San Dieg
Eastern
La Mesa

Metropolitan Transit System (MTS) is a California public agency and is comprised of San Diego Transit Corporation and San Diego Trolley, Inc. nonprofit public benefit corporations, in cooperation with Chula Vista Transit and National City Transit. MTS is the taxicab administrator for eight cities and the owner of the San Diego and Arizona Eastern Railway Company.

MTS member agencies include: City of Chula Vista, City of Coronado, City of El Cajon, City of Imperial Beach, City of La Mesa, City of Lemon Grove, City of National City, City of Poway, City of San Diego, City of Santee, and the County of San Diego.

Metropolitan Transit System

Agenda Item No. 19

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Appointment of Vice Chair for 2025 Public Security Committee

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors approve the appointment of Board Member Patricia Dillard as the Vice Chair for the Public Security Committee for 2025.

Budget Impact

None with this action.

DISCUSSION:

In January 2025, the Board of Directors approved the slate of appointments to MTS Committees for 2025. Membership of the 2025 Public Security Committee includes the following board members:

- Monica Montgomery Steppe (Chair of the Public Security Committee)
- Patricia Dillard
- Cesar Fernandez
- Henry Foster
- Steve Goble
- Ronn Hall
- Jose Rodriguez

At the time of the Committee appointments, a Vice Chair for the Public Security Committee was not identified. To ensure there is official coverage to preside over the Public Security Committee meetings in the Chair's absence, a Vice Chair appointment is required.

Therefore, staff recommends that the MTS Board of Directors to approve the appointment of Board Member Patrica Dillard as the Vice Chair for the Public Security Committee for 2025.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Metropolitan Transit System

Agenda Item No. 20

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Beyer Boulevard Trolley Station Transit-Oriented Development – Amendment to Disposition and Development Agreement

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to:

1) Execute an Amendment to the Disposition and Development Agreement (Amended DDA) with Beyer Family Housing L.P. for a Beyer Boulevard Trolley Station Transit Oriented Development Project, MTS Doc. No. G2589.1-22 (in substantially the same format as Attachment A); and

2) Take all actions necessary to fulfill MTS's obligations under the Amended DDA, including, but not limited to, executing a Ground Lease and related regulatory agreements for each project phase.

Budget Impact

The proposed amendment is not expected to have a budget impact. However, receipt of Ground Lease rent will be delayed since it does not begin to accrue until construction is complete and the project is occupied. Under MTS's Transit Oriented Development (TOD) program, the ground lease rent for an affordable housing project is generally limited because of the restricted rents built into the program and the various public subsidies used to construct the project. If the Amended DDA and resulting Ground Lease is executed, the project would be constructed at no cost to MTS, with annual ground lease rent after construction is complete generally being in the range of 5% of net income from the development (often under $50,000 per year). Staff would expect that the development, in close proximity to MTS transit services, would increase ridership at their respective stations.

Currently, 69 of the parking spaces in the Beyer Boulevard parking lot are leased to San Ysidro Health Center. Annual parking lease revenue to MTS is $30,643.68. Development of the TOD at Beyer Boulevard will require MTS to terminate the San Ysidro Health Center parking lease.

DISCUSSION:

On March 10, 2022 (AI 32) the Board approved a Disposition and Development Agreement (DDA) with an Affirmed Housing affiliated limited partnership, Beyer Family Housing L.P. for an affordable housing transit-oriented development at the Beyer Boulevard Trolley Station. The DDA was formally executed on March 23, 2022 (MTS Doc. No. G2589.0-22). The timeline in the DDA required Affirmed to execute a Ground Lease and close escrow on all necessary financial transactions no later than June 30, 2025.

The material terms of the DDA required Affirmed to construct a 100-unit multi-residential building (with 99 rent restricted units and one manager's unit) and a reconfigured surface parking lot for MTS transit use consisting of 74 parking spaces.

Today's proposed action, amending the DDA, would make the following changes:

1. Extend the deadline to secure financing and close on the Ground Lease to April 1, 2027 (extension of 22 months); and
2. Revise the MTS transit parking lot total to 68 spaces (loss of 6 spaces).

Development Financing Update – Recommended DDA Extension to April 1, 2027

Affirmed is an experienced affordable housing developer that recently completed an affordable housing development at the Grantville Transit Center, is in construction on an affordable housing development at the Rancho Bernardo Transit Station, and is also under contract with MTS to develop affordable housing at Spring Street Trolley Station. The proposed DDA will be with an Affirmed-affiliated limited partnership, Beyer Family Housing L.P. Since the 2022 DDA, MTS staff has been working with Affirmed to refine their development proposal and Affirmed has been acquiring the requisite financial capital. To date, Affirmed has secured the following funding commitments:

- $5M from City of San Diego Low and Moderate Income Housing Asset Fund, Round 2
- $3M from County of San Diego
- $3.02M from California Housing and Community Development Infill Infrastructure Grant
- $9.9M permanent loan commitment

Additional funding is needed to fully finance the project. Affirmed has been diligently pursuing the design and financing opportunities for the project over the last three years. During the last two years, the funding available for affordable housing projects in California has changed and been reduced. This has caused the standard time to obtain full financing for such projects to be extended beyond what was originally anticipated when the DDA was approved. Staff believes that Affirmed has undertaken reasonable efforts to pursue the project and that financing is likely to be secured if additional time is provided. In the alternative, cancelling the DDA for failure to meet the June 30, 2025 financing deadline would provide no benefit to MTS and would require MTS to start over seeking a new development partner. This would further delay any potential transit-oriented development at the Beyer Boulevard Trolley Station. Given Affirmed's track record with MTS, combined with the competitive nature of affordable housing finance and the secured funding commitments for the project, MTS staff is recommending the DDA Closing Date be extended to April 1, 2027.

Development Design Update – Recommended Parking Changes

The Beyer Boulevard Trolley Station is located in the City of San Diego, one Trolley stop north of the U.S. Port of Entry at San Ysidro:

Beyer Boulevard Trolley Station is 1.6 acres with 134 automobile parking spaces and 8 motorcycle parking spaces, 60 of the automobile parking spaces have been under lease to San Ysidro Health Center since approximately 2006. Due to a reconfiguration of the parking lot in 2015, the share of San Ysidro Health Center parking spaces increased to 69. Under current conditions, the site has 65 exclusive use automobile and 8 motorcycle parking spaces for transit patrons.

MTS Directed Redesign

Board Policy 18 (A) states “Joint use and development of MTS property shall always prioritize transit operational needs above all other considerations.” MTS Staff is consistently reviewing and reevaluating long-term transit needs. As these long-term needs evolve, MTS must also revisit joint development plans to ensure they don’t jeopardize transit operational needs.

After approval of the DDA, Affirmed refined its development plan and staff undertook a deeper level of review. During that process, it became apparent that the building footprint could possibly restrict future widening of the track, including the addition of a third track, through the Beyer Boulevard Trolley Station area. This is because the development footprint was using the visible parking lot areas. However, the official 100-foot wide railroad right-of-way through this corridor extends into the parking lot area by approximately 23.5 feet.

In early 2023 MTS staff requested that Affirmed shift the building footprint north out of the historic freight railroad corridor to preserve long-term trolley expansion options. At the same time, Affirmed encountered an unanticipated request from the City of San Diego to not only dedicate four feet of street right of way directly in front of the future building, but to extend the four feet across the entire MTS parcel which included the transit parking area. As a result of the MTS and City requests, Affirmed presented MTS Staff with three options. Two of the three options retained the original 74 MTS transit parking spaces but reduced housing density to 91 or 86 total units of varying bedroom counts. The third option was to keep the initially proposed 100-

unit density while reducing the parking by less than 10% from 74 to 68 parking spaces. All three options reduced the residential parking from 61 to 60 spaces.
Staff recommends that the parking reduction be approved.

Residential Parking (Reduction from 61 to 60 spaces). Traditionally, since the City of San Diego has no parking minimums for affordable housing projects in Transit Priority Areas, MTS does not require a minimum number of residential parking spaces as part of its development program. This decision is normally made by the developer based on their anticipated demand from residents. On this basis, the residential parking count is not normally considered a material term of MTS DDAs and is something that developers have discretion to adjust as the design process progresses. Nevertheless, the loss of one residential parking space is not anticipated to impact MTS.

Transit Parking (Reduction from 74 to 68 spaces). Because a portion of the Beyer Boulevard Trolley Station lot has been leased to San Ysidro Health since approximately 2005, the transit parking available for MTS riders is currently 65 spaces. Under the original DDA, MTS was set to gain 9 spaces, for a new total of 74 spaces. With the redesign, MTS will gain three spaces compared to the current transit user capacity, going from 65 spaces to 68 spaces. Staff reviewed the other options, including asking Affirmed to redesign the project to reduce density but preserve the 74 transit spaces. Doing so would have reduced the project density from 100-units to between 86 and 91. Overall, staff believes that the Board's joint development goals would be better met by keeping the density at 100-units and reducing the parking to 68 spaces.

The Amended DDA locks in the material terms of a Ground Lease that would be executed by the CEO once Developer has finalized its financing, grants, and building permits. The material terms include the following (*the only change from the original approval is the reduction in Section 4 of the replacement parking amount from 74 to 68 spaces):

1. Term. The term of the Ground Lease shall be 99 years.
2. Density. The Project shall consist of approximately 100 residential units with an estimated occupancy of 300. Any deviation of less than ten percent (10%) from the estimated unit shall not be considered a material change requiring Board approval.
3. Affordability. All units shall be rent restricted according to TCAC or CalHFA program requirements, except for one (1) staff unit. In compliance with Government Code section 54222.5, at least 25% of the units shall be at affordable rent, as defined in Section 50053 of the Health and Safety Code, to lower income households, as defined in Section 50079.5 of the Health and Safety Code. Rental units shall remain affordable to, and occupied by, lower income households for a period of at least 55 years.
4. Replacement Parking. Developer shall construct the Transit Parking Facilities substantially in conformance with a Site Plan and Scope of Work approved the MTS CEO, with approximately **68** automobile parking stalls for MTS's exclusive use. Upon completion of construction of the Transit Parking Facilities, the improvements and Transit Parking Site shall be transferred and/or returned to Board for operations, maintenance, and ownership.
5. Rent. Developer shall pay to Board as rent, in arrears, on an annual basis an amount equal to five percent (5%) of Developer's annual Net Cash Flow (as defined below) from the operation of the Project during the prior calendar year.
6. Leasehold Mortgage Terms. The Ground Lease shall include typical rights and protections for any leasehold mortgagees.

7. Construction Timeline. Construction of the Project is scheduled to take thirty (30) months after construction commencement to achieve substantial completion, subject to extension for "Force Majeure".
8. AB 1486 Compliance. Prior to close of escrow on the Ground Lease, Board shall record a restrictive covenant on the Site that complies with the Surplus Land Act (specifically as required by Government Code section 54222.5)
9. Prevailing Wage and Skilled Labor Requirements. Developer's Project construction activities shall comply with paragraphs C(7) and C(8) of MTS Board Policy No. 18:

   C(7): All projects approved pursuant to the program shall be considered public works for purposes of Chapter 1 (commencing with Section 1720) of Part 7 of Division 2 of the Labor Code, regardless of whether an exemption under Section 1720 of the Labor Code applies to the project.

   C(8): A joint development agreement between MTS and a private entity shall include a requirement that the developer's construction comply with Public Utilities Code section 120221.5.

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to:

3) Execute an Amended DDA with Beyer Family Housing L.P. for a Beyer Boulevard Trolley Station Transit Oriented Development Project, MTS Doc. No. G2589.1-22 (in substantially the same format as Attachment A); and

1) Take all actions necessary to fulfill MTS's obligations under the Amended DDA, including, but not limited to, executing a Ground Lease and related regulatory agreements for each project phase.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. Draft Amendment to Disposition and Development Agreement

Amendment No. 1 to
DISPOSITION AN DEVELOPMENT AGREEMENT
BY AND BETWEEN
San Diego Metropolitan Transit System
AND
Beyer Family Housing, L.P.

THIS AMENDMENT NO. 1 TO THE DISPOSITION AND DEVELOPMENT AGREEMENT ("Amended DDA") is made and entered into this 27th day of June, 2025 ("Effective Date"), by and between the **San Diego METROPOLITAN TRANSIT Development BOARD,** a California public agency, also known as the San Diego Metropolitan Transit System (the **"Board"**), and **BEYER FAMILY HOUSING, L.P.,** a California limited partnership **("Developer")**, on the other hand, individually referred to herein as the "Party" and collectively referred to herein as the "Parties", with reference to the following:

RECITALS

WHEREAS, the Board and the Developer entered into a Disposition and Development Agreement on March 23, 2022 ("DDA") (MTS Doc. No G2589.0-22) requiring the Developer to close escrow and enter into a Ground Lease with Board no later than June 30, 2025; and

WHEREAS, Developer has been diligently undertaking the required steps to close escrow and enter into a Ground Lease with the Board but, as of the Effective Date, is not in a position to do so; and

WHEREAS, Board requested a change in the building design to optimize long term transit options and Developer has successfully redesigned the building to meet the Board's request; and

WHEREAS, Board and Developer desire to amend the DDA by extending the closing date to April 1, 2027 and, in consideration of the Board's redesign request, reduce Replacement Parking for the Transit Parking Facilities from 74 to 68 parking stalls.

NOW THEREFORE, THE PARTIES HERETO AGREE AS FOLLOWS:

Section 1. REVISION OF CLOSING DATE

Section 201(A)(2) is hereby amended to read as follows:

2. The form of "**Ground Lease**" is attached hereto as **Exhibit F**. The Commencement Date of the Ground Lease shall be the date that escrow closes and the Memorandum of Lease for the Ground Lease in the form attached to the Ground Lease ("**Memorandum of Lease**") is recorded ("**Close of Escrow**"). The anticipated date for Close of Escrow is set forth on **Exhibit E** provided that the outside date scheduled for Close of Escrow (the "**Closing Date**") shall be no later than April 1, 2027, as the same may be extended in writing by the Chief Executive Officer of the Board. The material terms of the Ground Lease are listed in **Exhibit G**. Before Close of Escrow, the Chief Executive Officer for the Board and the designated representative for Developer may agree to changes in the final Ground Lease document that do not materially alter the terms listed in **Exhibit G** or otherwise materially increase the obligations of the Board other than as may be required by Developer's lenders.

Section 2. REVISION OF TRANSIT PARKING FACILITIES

Section 103(4) is hereby amended to read as follows:

4. Construction of the Transit Parking Facilities on the Transit Parking Site to accommodate the creation of the TOD Site and construction of the Residential Apartments. "**Transit Parking Facilities**" shall include the construction of approximately 68 parking stalls for Board's exclusive use, plus the curbs, landscaping, stormwater, sidewalk, lighting, and other improvements consistent with the Transit Parking Facilities site plan shown in **Exhibit B**; Board shall approve any deviation from the parking stall plan shown in **Exhibit B**. The Transit Parking Site will at all times be owned by the Board. Upon completion all improvements comprising the Transit Parking Facilities constructed on the Transit Parking Site will be publicly dedicated by Developer to the Board.

Section 3. UPDATE EXHIBITS

Exhibits A, B, C, D, E and G be removed and replaced with Exhibits A1, B1, D1, E1 and G1 attached hereto and incorporated within.

All other terms of the DDA shall remain the same.

IN WITNESS WHEREOF, Board and Developer have duly executed this Agreement as of the day and year first written above.

"Board" San Diego Metropolitan Transit Development Board, a California public agency also known as the Metropolitan Transit System

By: _____
Chief Executive Officer

"Developer"	Beyer Family Housing, L.P., a California limited partnership By: AHG Beyer, LLC. a California limited lability company, its Administrative General Partner, By: Affirmed Housing Group, Inc., a Delaware corporation, its Manager, By: _____ Name:_____ Title: _____

EXHIBIT A 1

Depiction of Beyer Property (Entire Parcel)

EXHIBIT B 1

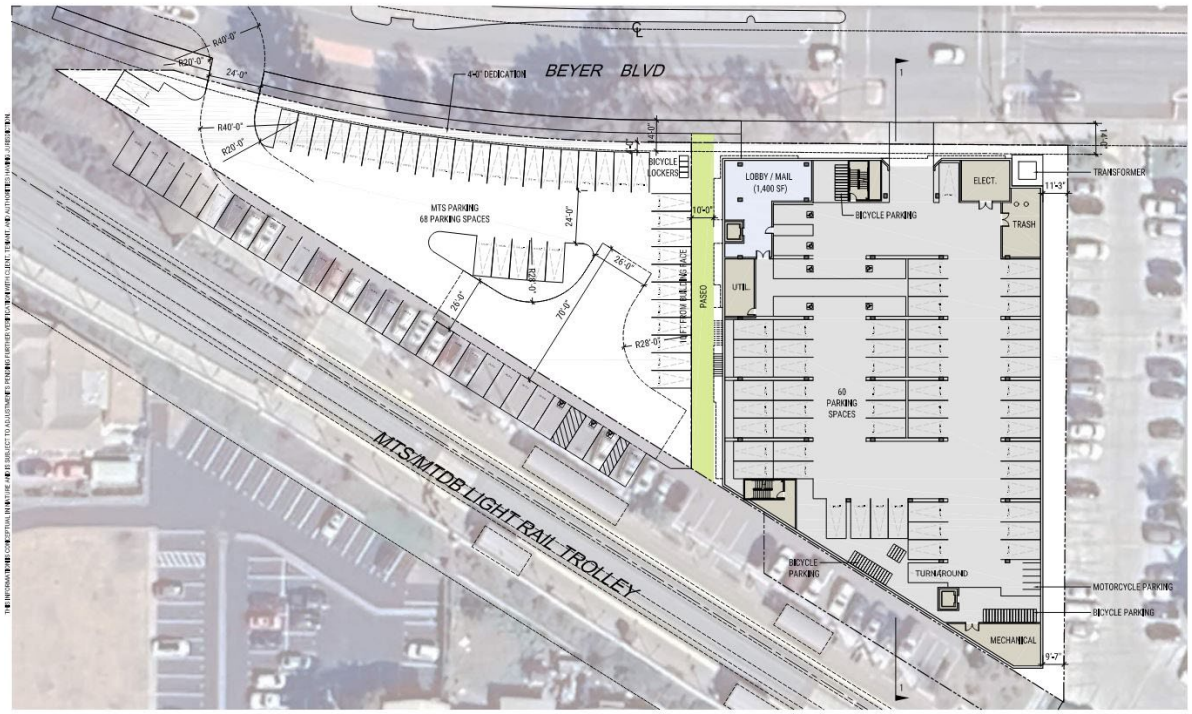

BEYER BLVD
4'-0" DEDICATION
MTS PARKING
68 PARKING SPACES
BICYCLE LOCKERS
LOBBY / MAIL
(1,400 SF)
BICYCLE PARKING
ELECT.
TRASH
TRANSFORMER
UTIL.
PASEO
60
PARKING
SPACES
MTS/MTDB LIGHT RAIL TROLLEY
BICYCLE PARKING
TURNAROUND
MOTORCYCLE PARKING
BICYCLE PARKING
MECHANICAL
ACMARTIN | BEYER BLVD. TROLLEY VILLAGE SAN YSIDRO, CA | 5/23/25 | 1/32" = 1' | LEVEL 01 - SITE PLAN | A-01

EXHIBIT C 1

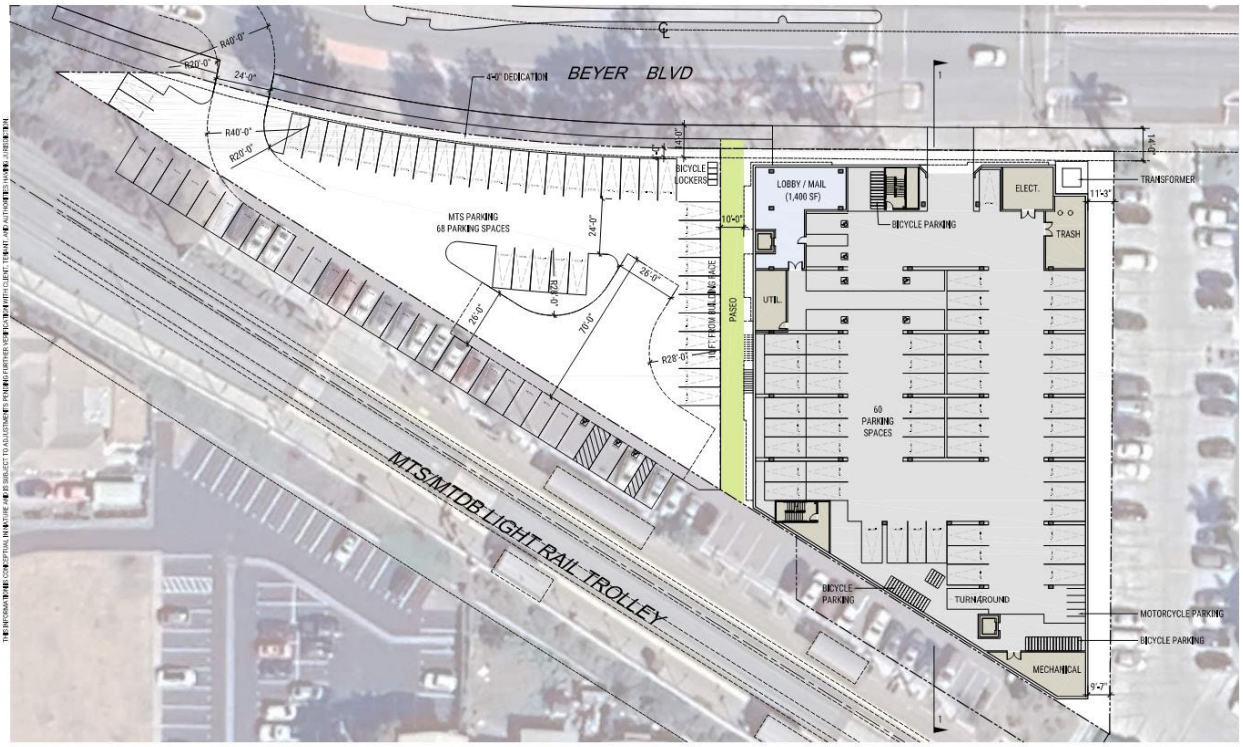
Scope of Development

The Developer shall be responsible for development of the Site as a multi-family mixed-income housing development of approximately one hundred (100) units in a six-story building, including first floor parking exclusively serving the residents. The development will be comprised of approximately one hundred twenty-seven thousand (128,175) square feet of gross residential area including approximately sixty (60) parking spaces, common area open space, and associated landscaping and public improvements. The development will include drought tolerant/resistant landscaping, a children's play area, outdoor gathering space, residents' community room, and property management office space.

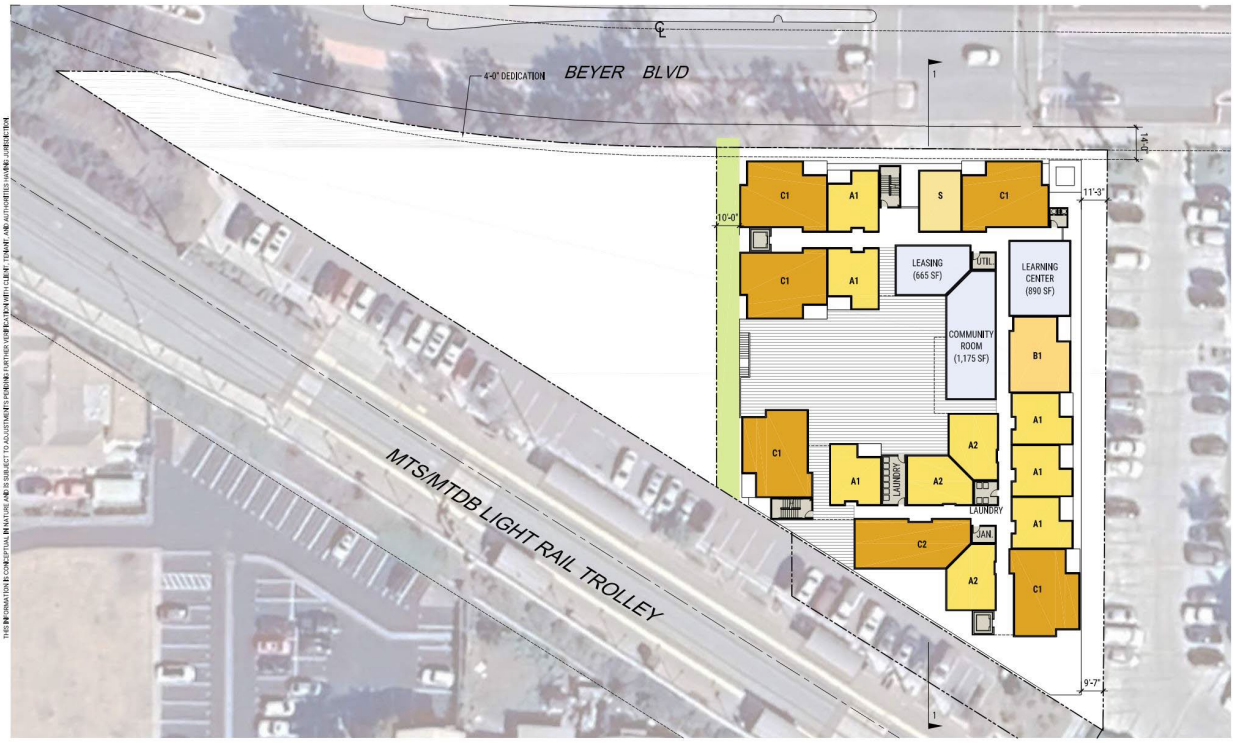
EXHIBIT D 1

List of Designated Plans

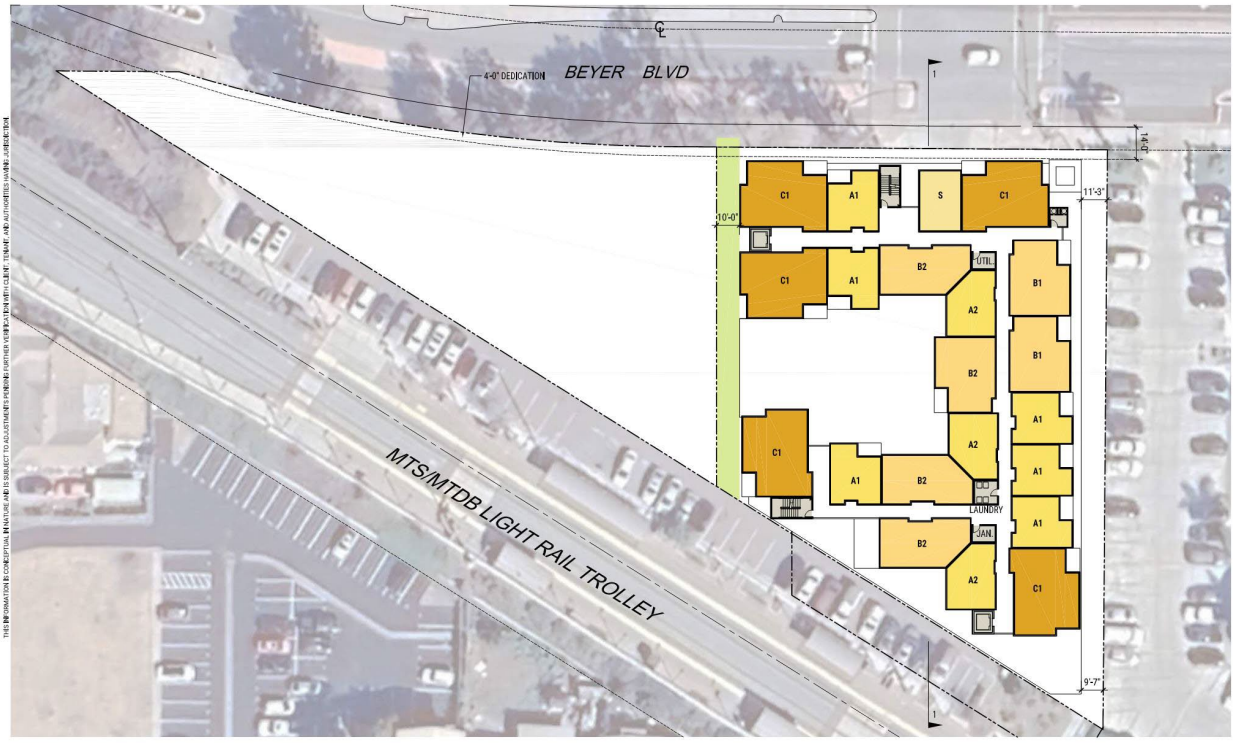
See attached



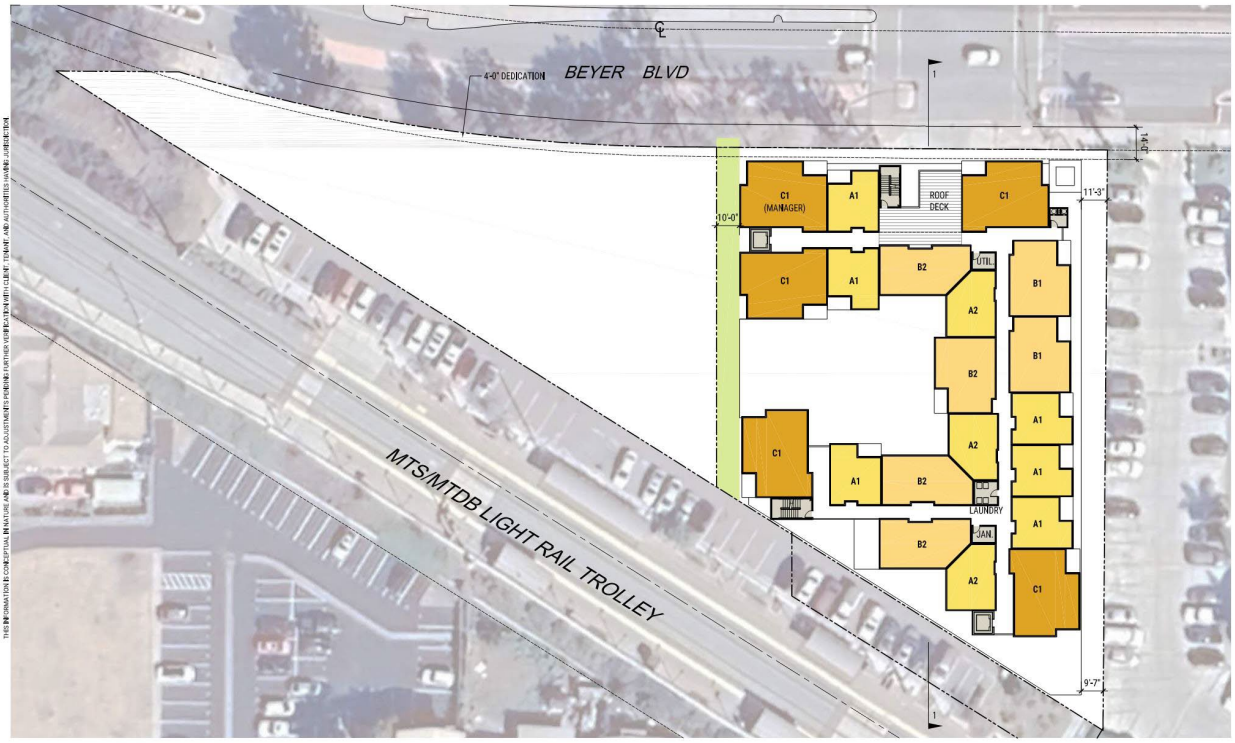
AC MARTIN | BEYER BLVD. TROLLEY VILLAGE SAN YSIDRO, CA | 5/23/25 | 1/32" = 1' | LEVEL 01 - SITE PLAN | A-01



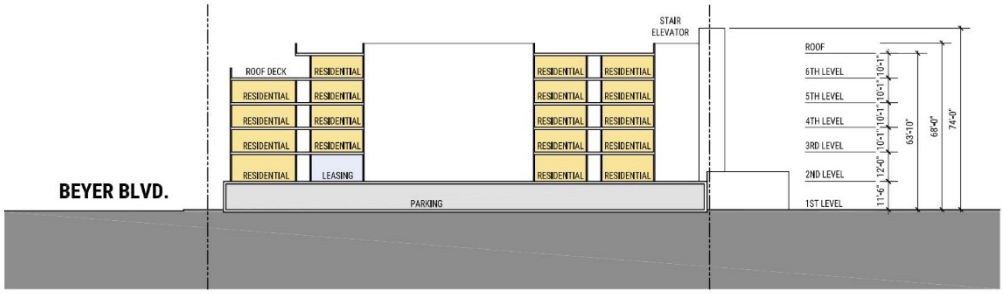
AC MARTIN | BEYER BLVD. TROLLEY VILLAGE SAN YSIDRO, CA | 5/23/25 | 1/32" = 1' | **LEVEL 02 PLAN** | A-02



AC MARTIN | BEYER BLVD. TROLLEY VILLAGE SAN YSIDRO, CA | 5/23/25 | 1/32" = 1' | **LEVEL 03-05 PLAN** | A-03



AC MARTIN | BEYER BLVD. TROLLEY VILLAGE SAN YSIDRO, CA | 5/23/25 | 1/32" = 1' | **LEVEL 06 PLAN** | A-04



AC MARTIN | BEYER BLVD. TROLLEY VILLAGE SAN YSIDRO, CA | 5/23/25 | 1/30" = 1' | **SECTION** | A-05

THIS INFORMATION IS CONCEPTUAL IN NATURE AND IS SUBJECT TO ADJUSTMENTS PENDING FURTHER WORK BETWEEN THE CLIENT, TENANT, AND AUTHORITIES HAVING JURISDICTION

AC MARTIN | BEYER BLVD. TROLLEY VILLAGE SAN YSIDRO, CA | 5/23/25 | 1/10" = 1' | UNIT PLANS | A-06

EXHIBIT E 1

Schedule of Performance

TASK/EVENT	TIME FOR PERFORMANCE
1. **Disposition and Development Agreement (DDA)**. Parties shall execute the DDA	March 2022
2. **Project Commitments**. Developer shall submit evidence of Project Commitments to the Board.	Not later than ten (10) days prior to the Closing Date.
3. **Evidence of Financing.** Developer shall submit Evidence of Financing to the Board.	Not later than ten (10) days prior to the Closing Date.
4. **Ground Lease.** Parties shall execute Ground Lease.	Not later than April 1, 2027
5. **Commencement of Construction**. The Developer shall commence construction.	Within thirty (30) days following the later of (i) Ground Lease execution and (ii) issuance of grading and building permits by the City of San Diego
6. **Completion of Construction**. The Developer shall complete construction.	No later than thirty (30) months after Commencement of Construction.

If the Developer fails to satisfy any obligation by the deadline set forth above, the Developer shall not be in default under this Agreement unless the Developer has first been given written notice of such failure and an opportunity to cure pursuant to **Sections 501** and **510**. Any cure by the Developer within the period set forth by **Sections 501** and **510** shall constitute a full and complete cure of the failure, notwithstanding the fact that the deadline established herein was not first met by the Developer.

EXHIBIT G 1

Material Terms of Ground Lease

1. Term. The term of the Ground Lease shall be 99 years.
2. Density. The Project shall consist of approximately 100 residential units with an estimated occupancy of 300. Any deviation of less than ten percent (10%) from the estimated unit shall not be considered a material change under Section 305(b).
3. Affordability. All units shall be rent restricted according to TCAC or CalHFA program requirements, except for one (1) staff unit. In compliance with Government Code section 54222.5, at least 25% of the units shall be at affordable rent, as defined in Section 50053 of the Health and Safety Code, to lower income households, as defined in Section 50079.5 of the Health and Safety Code. Rental units shall remain affordable to, and occupied by, lower income households for a period of at least 55 years. All units shall be rent restricted according to TCAC or CalHFA program requirements, except for one (1) staff unit.
4. Replacement Parking. Developer shall construct the Transit Parking Facilities substantially in conformance with a Site Plan and Scope of Work approved the MTS Chief Executive Officer, with approximately 68 parking stalls for MTS's exclusive use. Upon completion of construction of the Transit Parking Facilities, the improvements and Transit Parking Site shall be transferred and/or returned to Board for operations, maintenance, and ownership.
5. Rent. Developer shall pay to Board as rent, in arrears, on an annual basis an amount equal to five percent (5%) of Developer's annual Net Cash Flow (as defined below) from the operation of the Project during the prior calendar year (the "**Base Rent**"). Base Rent will be determined and paid, without any prior demand within one hundred twenty days (120) days after the last day of each calendar year and calculated based on the Gross Income received by Developer from operating the Project during the prior calendar year. For purposes of this Lease, "Net Cash Flow" shall mean all (A) cash receipts from the residential and non-residential components of the Project, including rental receipts from the lease of the Residential Apartments, and any other cash received by Developer derived from the Premises, but excluding (i) insurance proceeds or condemnation proceeds; (ii) security deposits or other tenant deposits; (iii) interest earned on project reserves; (iv) proceeds of loans or capital contributions; and (v) releases of funds from any operating or capital replacement reserves less (B) debt services, operating expenses and other expenses as detailed in the Ground Lease. Base Rent shall not commence until recordation of the Certificate of Compliance (the "**Rent Commencement Date**"). No Base Rent will be due by Lessee for any calendar years before the year in which the Rent Commencement Date occurs.
6. The Ground Lease shall include typical rights and protections for any leasehold mortgagees.
7. Construction Timeline. Construction of the Project is scheduled to take thirty (30) months after construction commencement to achieve substantial completion, subject to extension for "Force Majeure".
8. AB 1486 Compliance. Prior to close of escrow on the Ground Lease, Board shall record a restrictive covenant on the Site that complies with the Surplus Land Act (specifically as required by Government Code section 54222.5)

9. Prevailing Wage and Skilled Labor Requirements. Developer's Project construction activities shall comply with paragraphs C(7) and C(8) of MTS Board Policy No. 18:

   C(7): All projects approved pursuant to the program shall be considered public works for purposes of Chapter 1 (commencing with Section 1720) of Part 7 of Division 2 of the Labor Code, regardless of whether an exemption under Section 1720 of the Labor Code applies to the project.

   C(8): A joint development agreement between MTS and a private entity shall include a requirement that the developer's construction comply with Public Utilities Code section 120221.5.

Metropolitan Transit System

Agenda Item No. 21

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Donation of Buses That Have Exceeded Minimum Useful Life to Los Angeles Metropolitan Transportation Authority (LA Metro) – Agreement Approval (2/3 Vote Required)

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to negotiated and execute MTS Doc. No. B0783.0-25 (in substantially the same format as Attachment A) for the donation of up to 53 buses to LA Metro in advance of the 2028 Summer Olympic and Paralympic Games (2028 Summer Olympics).

Budget Impact

Approval of this action would authorize the donation of up to 53 buses to LA Metro, foregoing an estimated $209,880 which might be generated if the buses were auctioned off under MTS's normal procedure.

To determine fair market value of the 53 buses proposed for donation to LA Metro, a comparison to previous auction sales of similar MTS vehicles in the last three years was performed. Buses were sold and valued between $1,800 and $7,600. Using the average, the estimated fair market value of each vehicle is determined to be $3,960 each. The total fair market value cumulatively for the 53 buses totals approximately $209,880.

DISCUSSION:

At the end of Fiscal Year (FY) 24, MTS Bus Series 600, 700, and 2900 reached the end of their 12-year useful life as designated by Federal Transit Administration (FTA) regulations. With any capital asset that has reached the end of its useful life, MTS's general procedure under Board Policy 33 (Capital Asset Disposal) is to send it to auctioneer, J. J. Kane Associates doing business as Ken Porter Auctions (MTS Doc. No. G2649.0-23) to ensure that MTS will get a fair price for the vehicles. The amount of the commission is applied by J. J. Kane and the remaining proceeds distributed to MTS vary depending on the age and mileage of the vehicle. By contract, MTS receives 95% of the gross sales proceeds.

2028 Summer Olympics – Transit Service Needs

The Los Angeles 2028 Summer Olympics is scheduled for July 14 to 30, 2028 (Olympics) and August 15 to 27, 2028 (Paralympics) with venues across Los Angeles and Orange counties. As the transit provider with jurisdiction over most of the 2028 Summer Olympics venues, LA Metro is preparing to meet the transit needs of this mega event. One effort underway is to create a Supplemental Bus System (SBS). The SBS is a temporary supplementary transit system created to augment the existing public transit system to ensure the additional extraordinary demand of a megaevent for transportation is met and to provide an enhanced service with potential legacy benefits. The SBS consists of the following elements:

- Bus vehicles or shuttles that are permanently or temporarily procured or borrowed from other transit agencies in California and beyond
- Bus malls at venue and park and ride mobility hubs to serve spectators and workforce
- Bus depots to maintain, clean, fuel/charge and support the operation of the SBS
- Operations team that includes drivers, mechanics, supervisors, schedulers, etc.

The SBS will generally provide express bus service between venues and mobility hubs. SBS service will be strategically planned to meet the demand of the 2028 Summer Olympics and complement the existing transit network. The system will be designed to achieve desired service levels for a successful operation of the spectator/Workforce system. It will also support regional zero-emission and sustainable transportation goals by committing to a zero or near zero bus fleet. Based on the preliminary event schedule and various operating assumptions, it is anticipated that over 2,700 additional buses will be needed on a temporary basis to provide spectator transportation for the 2028 Summer Olympics.

Much like the 1996 Summer Olympics in Atlanta, GA and the 2002 Winter Olympics in Salt Lake City, UT, LA Metro and the Olympic Committee are asking the transit industry to provide buses in support of the Games Enhanced Transit Service (GETS) through the securement of the needed buses.

Request for MTS to Donate Buses to LA Metro for the 2028 Summer Olympics SBS

As part of this 2028 Summer Olympics SBS effort, LA Metro approached MTS regarding MTS's used bus vehicles, requesting that MTS donate buses that are no longer needed for our fleet needs.

After reviewing MTS's inventory of buses that have reached the end of their useful life and are no longer needed for revenue service, MTS has identified 53 buses that can meet LA Metro's current, immediate needs.

Although MTS could proceed with its general procedure to auction these 53 buses, a donation of these buses would greatly assist LA Metro, a public transportation agency, in its efforts to transport a large number of spectators and workforce attending the various games and events for the 2028 Summer Olympics. While the event is more than 3 years away and will largely be held in Los Angeles and Orange counties, it is a great opportunity to showcase how the public transit industry across California and the nation can pull together in partnership to support such a large, global sporting event.

Because it is a deviation from MTS Board Policy No. 33, a two-third vote is required to approve a donation of the buses to LA Metro, in lieu of a sale or auction for value. The donation of the buses, in lieu of a sale or auction for value, is in the interest of MTS and the greater public because:

a. The 2028 Summer Olympics is a unique event that requires mutual aid from the greater Southern California region to support this public event.

b. The transportation needs of this mega event are beyond the capacity of a single transit agency, including LA Metro.

c. MTS staff determined it would be more cost effective to donate the buses when they are ready to be removed from MTS's revenue fleet instead of storing them for a potential lease or loan to LA Metro in 2028. The costs to store and maintain the vehicles during the interim 1 to 3 years would have a more negative impact on MTS than any lease revenue and/or future auction proceeds that would result from a temporary loan of the buses to LA Metro.

d. The buses, which were funded with local, state, and federal tax dollars, will be donated for use as public transit.

Per FTA regulations, rolling stock with a fair market value of $10,000 or less per unit that was purchased using FTA financial assistance, may be retained, sold, or otherwise disposed of when no longer needed for a public transportation purpose without any obligation to reimburse FTA.

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to negotiated and execute MTS Doc. No. B0783.0-25 (in substantially the same format as Attachment A) for the donation of up to 53 MTS buses to LA Metro in advance of the 2028 Summer Olympics.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. Draft Agreement MTS Doc. No. B0783.0-25

AGREEMENT FOR
DONATING END-OF-USEFUL-LIFE BUS VEHICLES
BETWEEN SAN DIEGO METROPOLITAN TRANSIT SYSTEM AND
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

This Agreement for Donating of End-of-Useful Life Bus Vehicles ("Agreement") is made on this _____ day of ____ 2025 by and between Los Angeles County Metropolitan Transportation Authority ("LA Metro"), a California Public Agency, and San Diego Metropolitan Transit System ("MTS"), a California Public Agency.

RECITALS

WHEREAS, LA Metro has requested MTS End-of-Useful Life Bus Vehicles for purposes of supporting transportation needs for the 2028 U.S. Summer Olympics;

WHEREAS, MTS Board Policy No. 33 "Capital Asset Disposal" and Federal Transit Administration (FTA) regulations allow for the disposal of End-of-Useful Life Bus Vehicles; and

WHEREAS, MTS agrees to assist in accommodating the request of LA Metro.

AGREEMENT

NOW THEREFORE, in consideration of the mutual benefits to the parties hereto and the mutual obligations expressed herein, the parties hereby agree as follows:

1. MTS agrees to make available for inspection to transfer to LA Metro up to 53 End-of-Useful Life Bus Vehicles "Vehicles", as shown in Attachment 1. MTS reserves the right to make changes to the Vehicles that MTS makes available for inspection.
2. LA Metro agrees that the following items will not be included in the Vehicles:
    a. Radio system,
    b. Cradlepoint Router,
    c. Farebox and transit card reader system, and
    d. Camera system Hard drive.
3. MTS will remove all associated logos from Vehicles, however existing body paint on bus may remain.
4. Tires will be at the end of useful life (i.e., scrap tires) and released from any lease or ownership. LA Metro shall be responsible for all tire replacements.
5. Wrapping of Vehicles. LA Metro agrees to completely wrap the Vehicles to differentiate it from the MTS brand. Vehicles must be completely wrapped during operating hours.
6. Notification of Vehicles Ready for Inspection. MTS shall notify LA Metro when Vehicles, or a portion of Vehicles, are ready for inspection. MTS and LA Metro shall coordinate the scheduling of the vehicle inspection, which should be scheduled within one (1) week of MTS's notification that Vehicles, or a portion of Vehicles are available for viewing.
7. Inspection of Vehicles to be Transferred. The inspection of the Vehicles to be transferred will be performed by LA Metro's designated Quality Assurance contracted inspectors at the MTS's facility prior to transportation of the subject Vehicles, which may occur in

batches. MTS shall assist with Vehicle movements during the inspection. A hoist or pit may be necessary. The addresses for which the inspections will occur are:

a. Imperial Ave Division (IAD)
   100 16th Street
   San Diego, CA 92101
b. South Bay Division (SBD)
   3650 Main Street
   Chula Vista, CA 92113

8. Acceptance and Transfer. LA Metro acceptance of each vehicle shall be established after completion and passing of the inspection. Date of Transfer shall mean the date the subject Vehicle has been accepted and transferred.
9. Bill of Sale. A Bill of Sale shall be signed by MTS's and LA Metro's designated representatives for each accepted Vehicle prior to transport of Vehicle from MTS's facility, in a similar format as Attachment 2 – Sample Bill of Sale.
10. Bill of Sale Designated Signatories. The following are the designated signatories that are authorized to sign the Bill of Sale:
    a. MTS Authorized Signatory for Bill of Sale
        i. MTS Director of Fleet and Facility Maintenance
    b. LA Metro's Authorized Signatory for Bill of Sale
        i. TBD
11. Transport. LA Metro shall be responsible for transporting Vehicles from MTS's facility to LA Metro's facility, including any transportation costs. MTS shall coordinate time(s) and date(s) of Vehicles transfer from MTS's Property with LA Metro. The inspection, acceptance and transfer process should be completed between June – September 2025.
12. Representations, Warranties, and Disclosures. The vehicles are transferred "AS IS", and MTS does not in any way, expressly or impliedly, give any warranties to LA Metro. MTS expressly disclaims any implied warranties of merchantability or of fitness for a particular purpose.
13. Insurance and Tags. LA Metro acknowledges that unless prohibited by applicable law, any insurance coverage, license, tags, plates, or registration maintained by MTS on the Vehicles shall be canceled upon the Date of Transfer.
14. Release of Liability. After the Vehicles are accepted by LA Metro, LA Metro agrees to indemnify and hold harmless, MTS and any and all of its officers or employees from and against any and all claims, loss, damage, charge, or expense, whether direct or indirect, which MTS or such officers or employees may be put or subjected, by reason of any damage, loss, or injury of any kind or nature whatsoever to persons or property caused by or resulting from or in connection with any negligent act or action, or any neglect, omission, or failure to act when under a duty to act on the part of LA Metro or any of its officers, agents, employees or subcontractors arising out of or incurred as a result of the use of all Vehicles donated or transferred to LA Metro or arising out of this Agreement.
15. The Parties agree that MTS will be released of all liability resulting from the operation of the Vehicles effective upon the Date of Transfer (California Vehicle Code Section 5602).

MTS shall cause the *Notice of Release of Liability* to be properly filed with the State Department of Motor Vehicles upon the Date of Transfer.

16. Transferring Title. MTS agrees to transfer title of accepted Vehicles via FedEx mail on the Date of Transfer to this LA Metro address:
    a. Attn: **TBD**
       LA Metro Department
       Address line 1
       Address line 2
17. Transferring Title Authorized Signatories: The following are the designated signatories that are authorized to sign the Transfer of Title:
    a. MTS Authorized Signatory for Transfer of Title
        i. MTS Financial Analyst
    b. LA Metro's Authorized Signatory for Transfer of Title
        i. TBD
18. Processing Title Transfer and Registration. LA Metro shall accordingly process and pay all taxes, costs, and fees imposed by any governmental entity associated with the title transfer and registration for accepted Vehicles.
19. This Agreement shall be binding and inure to the benefit of the parties, their successors, assigns, and personal representatives.

IN WITNESS WHEREOF, the parties have read and fully understand the terms and conditions as set out in this Agreement.

Executed on the dates written below.

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY	**SAN DIEGO METROPOLITAN TRANSIT SYSTEM**
By:	By:
(Name, Title)	(Name, Title)
(Date)	(Date)
Approved as to form:	Approved as to form:
By:	By:
(Name, Title)	(Name, Title)
(Date)	(Date)

Attachment 1 – End of Useful Life Vehicle List

Attachment 2 – Sample Bill of Sale

Attachment 1

End of Useful Life Vehicle List

	Bus #	VIN	License #	Mileage as of date 6/16/2025
1	601	5FYC5FB16BC038891	1495366	587141.20
2	602	5FYC5FB18BC038892	1511793	585567.30
3	603	5FYC5FB1XBC038893	1511794	590871.20
4	604	5FYC5FB11BC038894	1495369	576737.40
5	605	5FYC5FB13BC038895	1495370	580832.70
6	606	5FYC5FB15BC038896	1511795	567916.60
7	607	5FYC5FB17BC038897	1495372	586137.10
8	608	5FYC5FB19BC038898	1259138	578764.80
9	609	5FYC5FB10BC038899	1531986	590274.80
10	611	5FYC5FB15BC038901	1495373	577660.80
11	612	5FYC5FB17BC038902	1511730	598901.90
12	613	5FYC5FB19BC038903	1495374	578550.40
13	614	5FYC5FB10BC038904	1495375	577669.30
14	615	5FYC5FB12BC038905	1492215	583359.70
15	616	5FYC5FB14BC038906	1492349	580644.30
16	617	5FYC5FB16BC038907	1511678	588548.00
17	618	5FYC5FB18BC038908	1492345	585945.70
18	619	5FYC5FB1XBC038909	1495377	567015.50
19	620	5FYC5FB16BC038910	1495378	588184.10
20	621	5FYC5FB18BC038911	1495379	572462.50
21	703	5FYC5FB18CB040407	1495383	552107.50
22	706	5FYC5FB18CB040410	1492351	554097.90
23	708	5FYC5FB11CB040412	1492217	542162.90
24	710	5FYC5FB15CB040414	1492206	549966.80
25	711	5FYC5FB17CB040415	1495388	548766.70
26	712	5FYC5FB19CB040416	1495389	549126.80
27	713	5FYC5FB10CB040417	1495390	558941.90
28	715	5FYC5FB14CB040419	1495391	534450.20
29	716	5FYC5FB10CB040420	1495392	562091.10
30	717	5FYC5FB12CB040421	1495393	557347.50
31	718	5FYC5FB14CB040422	1495394	550306.70
32	720	5FYC5FB18CB040424	1495396	538408.70
33	722	5FYC5FB11CB040426	1495397	544922.50
34	723	5FYC5FB13CB040427	1495398	556288.20
35	724	5FYC5FB15CB040428	1495399	554342.50
36	726	5FYC5FB13CB040430	1511753	496985.30

	Bus #	VIN	License #	Mileage as of date 6/16/2025
37	727	5FYC5FB15CB040431	1495401	545660.90
38	729	5FYC5FB19CB040433	1492362	530792.20
39	2908	5FYC5FB19CB040691	CA/1372786	483057.00
40	2910	5FYC5FB12CB040693	CA/1372717	474035.00
41	2914	5FYC5FB1XCB040697	CA/1372719	483189.00
42	2915	5FYC5FB11CB040698	CA/1372781	442450.00
43	2917	5FYC5FB16CB040700	CA/1372784	481627.00
44	2923	5FYC5FB1XBC038912	CA/1327647	532564.00
45	2924	5FYC5FB11BC038913	CA/1362584	538507.00
46	2925	5FYC5FB13BC038914	CA/1362589	548686.00
47	2926	5FYC5FB15BC038915	CA/1327649	565375.00
48	2927	5FYC5FB17BC038916	CA\1362588	561771.00
49	TBD	TBD	TBD	
50	TBD	TBD	TBD	
51	TBD	TBD	TBD	
52	TBD	TBD	TBD	
53	TBD	TBD	TBD	

Attachment 2

Sample Bill of Sale

BILL OF SALE

Vehicle	
Date of Transfer	
Make & Model	
VIN	
Odometer	

Transferor: San Diego Metropolitan Transit System (MTS)

Transferee: Los Angeles County Metropolitan Transportation Authority (LA Metro)

In accordance with MTS Contract Doc No. B0783.0-25, MTS did transfer to LA Metro our right, title and interest in and to the above-described Vehicle. This Vehicle is transferred “As Is”. MTS does not in any way, expressly or impliedly, give any warranties to LA Metro. MTS expressly disclaims any implied warranties of merchantability or of fitness for a particular purpose.

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY	**SAN DIEGO METROPOLITAN TRANSIT SYSTEM**
By:	By:
(Name, Title)	(Name, Title)
(Date)	(Date)

Metropolitan Transit System

Agenda Item No. 22

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Disbursement of Chula Vista Billboard Reserve Fund – Fund Transfer

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors approve the disbursement of $2,700,000.00 to the City of Chula Vista for the Chula Vista Bayfront Shuttle Service (Shuttle) pursuant to the "Agreement Between the City of Chula Vista and the Metropolitan Transit Development Board for Continuation of the Chula Vista Billboard Reserve Fund and Expenditure of Revenues within the Fund" (Billboard Reserve Agreement) (MTDB Doc. No. S200-00-102).

Budget Impact

MTS currently has 13 active billboards on MTS and San Diego and Arizona Eastern Railway (SD&AE) property, three of which are in the City of Chula Vista adjacent to Interstate 5. Per the terms of the Billboard Reserve Agreement, all revenue from the three Chula Vista billboards is deposited into an MTS-maintained Chula Vista Billboard Reserve Fund (Fund). The three Chula Vista billboards lease revenue is between approximately $240,000.00 and $300,000.00 per year. As of the end of Fiscal Year 2024 there is $2,825,634 in the Fund. The $2,700,000.00 disbursement would come from the Fund. This disbursement would be at no cost to MTS.

DISCUSSION:

MTS[1] acquired its original Blue and Orange Line railroad right-of-way from Southern Pacific Railroad in 1979. As part of that transaction, MTS also acquired the leases of existing billboards on the property. To convert the mostly single-track freight railroad into a double track passenger light rail system, some of the billboards were required to be removed or relocated. In the City of Chula Vista (City), the billboard relocation required a Conditional Use Permit (CUP) approved by the City Council. In exchange for the CUP, MTDB set aside funds from the relocated billboards in the City for projects "which benefit mass transit occurring within the City" (Billboard Reserve Agreement, Section 1). In 1999, MTS and the City of Chula Vista formally memorialized the arrangement by entering into the Billboard Reserve Agreement. The Billboard

[1] MTS is also known as the San Diego Metropolitan Transit Development Board (MTDB). (See Pub. Util. Code section 120050.)

Reserve Agreement requires the City to submit a written request to MTS to access billboard reserve Fund monies.

On May 22, 2025, the City formally requested a $2,700,000.00 disbursement from the Fund. The monies are to support the City's Bayfront Master Plan Public Access Program (PAP). Per the attached letter from the City, the City's PAP proposes to use the billboard funds to support an "environmentally friendly, affordable and accessible shuttle bus service to interconnect the Bayfront with the E Street and H Street Trolley Stations." The Shuttle will run in a loop along E Street, F Street, 3rd Avenue, H Street, and through the Bayfront site while making stops at MTS E and H Street Trolley Stations. The Shuttle's use of the MTS Trolley Stations would be governed by a License between MTS and the City. Operation of the Shuttle on MTS Trolley Stations would be at no cost to MTS. The Shuttle will provide a convenient first and last mile connection between the UCSD Blue Line and the recently opened Gaylord Hotel, Recreational Vehicle Park, Living Coast Discovery Center, and other parks in on the Bayfront.

Therefore, staff recommends that the MTS Board of Directors approve the disbursement of $2,700,000.00 to the City of Chula Vista for the Shuttle pursuant to the Billboard Reserve Agreement.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, julia.tuer@sdmts.com

Attachments: A. MTDB Doc. No. S200-00-102
B. Letter from City of Chula Vista Office of the City Manager, May 22, 2025

Agreement Between the City of Chula Vista and the Metropolitan Transit Development Board for Continuation of the Chula Vista Billboard Reserve Fund and Expenditure of Revenues within the Fund

This Agreement ("Agreement") is entered into effective as of 9-21-, 1999, by and between the City of Chula Vista ('City') and Metropolitan Transit Development Board ("MTDB") with reference to the following facts:

Whereas, in March 1984, the City, as part of a litigation settlement between MTDB, SDA&E and two billboard companies, agreed to allow Gannet Outdoor Co. and Metromedia, Inc. to place two billboards in the MTDB right-of-way along Interstate 5; and

Whereas, at the same time, MTDB developed a Chula Vista Billboard Reserve Fund which is funded by the lease revenues from billboard owners; and

Whereas, in December 1990, City issued a CUP for another billboard company allowing the relocation of one billboard into the SDA&E right of way in exchange for the removal of 5 billboards and an annual contribution to the Billboard Reserve Fund; and

Whereas, City and MTDB have maintained and disbursed funds from the Billboard Reserve Fund for projects which benefit mass transit; and

Whereas, the parties now desire to memorialize their understanding of the terms and conditions under which monies for this fund are generated and disbursed.

NOW, THEREFORE, in consideration of the recitals and the mutual obligation of the parties set forth herein, MTDB and City agree as follows:

1. Chula Vista Billboard Reserve Fund

MTDB shall maintain a reserve fund known as the "Chula Vista Billboard Reserve Fund" ("Fund"). Revenues for this Fund shall be generated from lease payments from private parties for the use of billboards located within the SD&AE right-of-way within the City of Chula Vista. City shall determine all terms and conditions related to the permitting of the billboards. This includes, but is not limited to, the time period the billboards will be permitted for and fees to be charged to the applicant. MTDB shall determine all terms and conditions related to the leasing of the SD&AE right-of-way. These revenues shall be held in trust by MTDB for use by the City on projects which benefit mass transit occurring within the City ("Qualified Projects"). Qualified projects shall include, but are not limited to, landscaping the areas along the right-of-way, graffiti and litter removal in these same areas, pedestrian improvements along the trolley line within city limits, and other projects as may be agreed to by City and MTDB.

2. Expenditure of Billboard Reserve Fund Revenues

In order to access Fund monies, City shall submit a written request to MTDB. The request shall include a description of the Qualified Project, the amount of funds requested, and a schedule for expenditure. Each request shall be subject to approval by a majority vote of MTDB and the Chula Vista City Council.

3. Entire Agreement

This Agreement, together with any other written document referred to or contemplated herein, embodies the entire Agreement and understanding between the parties relating to the subject matter hereof. Neither this Agreement nor any provision hereof may be amended, modified, waived or discharged except by an instrument in writing executed by the party against which enforcement of such amendment, waiver or discharge is sought.

4. Capacity of Parties

Each signatory and party hereto hereby warrants and represents to the other party that it has legal authority and capacity and direction from its principal to enter into this Agreement, and that all resolutions or other actions have been taken so as to enable it to enter into this Agreement.

5. Governing Law/Venue

This Agreement shall be governed by and construed in accordance with the laws of the State of California. Any action arising under or relating to this Agreement shall be brought only in the federal or state courts located in San Diego County, State of California, and if applicable, the City of Chula Vista, or as close thereto as possible. Venue for this Agreement, and performance hereunder, shall be the City of Chula Vista.

Agreement Between the City of Chula Vista and the Metropolitan Transit Development Board for Continuation of the Chula Vista Billboard Reserve Fund and Expenditure of Revenues within the Fund

City of Chula Vista

by _____
Shirley Horton, Mayor

Date 10/26/99

Metropolitan Transit Development Board

by _____
Thomas F. Larwin
General Manager

Date 10/15/99

ATTEST:

_____
City Clerk

Approved in form by:

_____
City Attorney

Date 10/25/99

Approved in form by:

_____
Jack Limber
General Counsel/Deputy General Manager

Date 10/12/99

CITY OF CHULA VISTA

Office of the City Manager

May 22, 2025

Sharon Cooney
CEO
San Diego Metropolitan Transit System
1255 Imperial Avenue
San Diego, CA 92101

RE: Formal Request of $2,700,000 Disbursement from the "Chula Vista Billboard Reserve Fund"

Dear Ms. Cooney:

The City of Chula Vista and San Diego Metropolitan Transit System ("MTS") are parties to that certain *Agreement for Continuation of the Chula Vista Billboard Reserve Fund and Expenditures and Revenues within the Fund*, dated September 21, 1999 and recorded as MTDB Doc No. S200-00-102 (the "Agreement"). As authorized by the Agreement, the City of Chula Vista desires to request a $2,700,000 disbursement from the "Chula Vista Billboard Reserve Fund" held in trust by MTS. These funds will be used to implement the Chula Vista Bayfront Shuttle Program which will increase utilization of public transit to connect users to the shoreline.

Access to the shoreline is a key component of the Public Access Program ("PAP") of the Chula Vista Bayfront Master Plan. The PAP defines and implements an extensive multi-modal pedestrian, bicyclist, mass transit, and automobile-based system to provide a variety of free and low-cost Chula Vista waterfront public recreational opportunities for residents and visitors. Among the improvements, the PAP requires an environmentally friendly, affordable and accessible shuttle bus service to interconnect the Bayfront with the E Street and H Street trolley stations and the adjacent community.

The Chula Vista Bayfront Shuttle would service the Master Plan area with a key focus on connecting general users to and from: downtown areas east of I-5; the Gaylord Resort and Convention Center; residential projects; park areas; and existing trolley stops. The route (Figure 1) will operate as a two-way loop with stops in both directions. Portions of the ultimate route have yet to be constructed, therefore until completion of missing segments, an interim route will be implemented. To initially encourage public use of the shuttle, shuttles would typically run every 15 minutes and will be re-evaluated based on ridership.

276 Fourth Avenue, Chula Vista, CA 91910 | www.chulavistaca.gov | (619) 691-5031 | fax (619) 409-5884

Figure 1

On May 6, 2025, via Resolution No. 2025-061 (attached), the City Council of the City of Chula Vista approved an agreement with Rafo Investment Inc. DBA SD Luxury Limos to provide Bayfront Shuttle services and appropriated Billboard Reserve Funds.

Thank you for your consideration of this request and your continued partnership in serving the Chula Vista community. If you have any questions or if you need additional information in order to process this request, please contact Adrianna Relph at (619) 691-5254 or arelph@chulavistaca.gov.

Sincerely,

Tiffany Allen
Assistant City Manager

RESOLUTION NO. 2025-061

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CHULA VISTA APPROVING THE CHULA VISTA BAYFRONT SHUTTLE SERVICES AGREEMENT BETWEEN THE CITY AND RAFO INVESTMENT INC. DBA SD LUXURY LIMOS; APPROVING THE REQUEST OF A $2,700,000 DISBURSEMENT FROM THE CHULA VISTA BILLBOARD RESERVE FUND HELD BY SAN DIEGO METROPOLITAN TRANSIT SYSTEM (MTS) TO FUND SAID SHUTTLE PROGRAM; AND APPROPRIATING $164,640 TO THE ECONOMIC DEVELOPMENT DEPARTMENT BASED ON REVENUE ASSOCIATED WITH SAID BILLBOARD FUNDS

WHEREAS, the Chula Vista Bayfront Master Plan (CVBMP), approved in August 2012, guides development within the Chula Vista Bayfront; and

WHEREAS, the CVBMP implements a Public Access Program (PAP) that ensures the public's right of access to the shoreline by increasing pedestrian and bikeway connections, increasing public transportation connections, and improving circulation along the coast; and

WHEREAS, to increase shoreline access through public transit, the City requires shuttle services connecting the Chula Vista Bayfront with nearby trolley stations and the adjacent community; and

WHEREAS, in order to procure these services, the City solicited proposals in accordance with Chula Vista Municipal Code Section 2.56.080, received three proposals, and selected Rafo Investment Inc. DBA SD Luxury Limos as the most qualified amongst those submitting; and

WHEREAS, the Chula Vista Billboard Reserve Fund was created by the San Diego Metropolitan Transit System (MTS) and is funded by a portion of lease revenues from billboard owners; and

WHEREAS, MTS has maintained this revenue Fund to be disbursed to the City of Chula Vista for use on projects which benefit mass transit occurring within the City; and

WHEREAS, staff is requesting $2,700,000 from the Fund, to fund the operation of the Chula Vista Bayfront Shuttle program to increase shoreline access through public transit, as stated above.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Chula Vista, that it approves the Chula Vista Bayfront Shuttle Services Agreement, between the City and Rafo Investment Inc. DBA SD Luxury Limos, in the form presented, with such minor modifications as may be required or approved by the City Attorney, a copy of which shall be kept on file in the Office of the City Clerk and authorizes and directs the Mayor to execute same.

BE IT FURTHER RESOLVED by the City Council of the City of Chula Vista, that it approves the request of a $2,700,000 disbursement from the Chula Vista Billboard Reserve Fund held in trust by MTS to fund operation of the Chula Vista Bayfront Shuttle.

BE IT FURTHER RESOLVED by the City Council of the City of Chula Vista, that it amends the Fiscal Year 2024-25 budget and appropriates $164,640 to the Supplies and Services category of the Economic Development Department.

[SIGNATURES ON THE FOLLOWING PAGE]

Presented by

DocuSigned by:
AA76F15D450845D...
Tiffany Allen
Assistant City Manager

Approved as to form by

Signed by:
96F66761308B47B...
Marco A. Verdugo
City Attorney

PASSED, APPROVED, and ADOPTED by the City Council of the City of Chula Vista, California, this 6th day of May 2025 by the following vote:

AYES:	Councilmembers:	Chavez, Fernandez, Inzunza, and Preciado
NAYS:	Councilmembers:	None
ABSENT:	Councilmembers:	None
ABSTAIN:	Councilmembers:	McCann

DocuSigned by:
7804EC23B90B473...
John McCann, Mayor

ATTEST:

DocuSigned by:
3074D104EAF342E...
Kerry K. Bigelow, MMC, City Clerk

STATE OF CALIFORNIA)
COUNTY OF SAN DIEGO)
CITY OF CHULA VISTA)

I, Kerry K. Bigelow, City Clerk of Chula Vista, California, do hereby certify that the foregoing Resolution No. 2025-061 was duly passed, approved, and adopted by the City Council at a regular meeting of the Chula Vista City Council held on the 6th day of May 2025.

Executed this 6th day of May 2025.

DocuSigned by:
3074D104EAF342E...
Kerry K. Bigelow, MMC, City Clerk

Metropolitan Transit System

Agenda Item No. 23

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

South Bay Maintenance Facility (SBMF) Zero Emission Bus (ZEB) Backup Power Project – Contract Award

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors authorize the Chief Executive Officer (CEO) to execute MTS Doc. No. PWB437.0-25 (in substantially the same format as Attachment A), with G A Abell, Inc. dba Precision Electric Co., for the SBMF ZEB Backup Power Construction Project in the amount of $6,734,024.00 plus 10% contingency.

Budget Impact

The total funding approved for this contract would be $7,407,426.40 ($6,734,024.00 plus 10% contingency of $673,402.40). The project will be funded by the MTS Capital Improvement Program (CIP) 1009117501 – SBMF ZEB Backup Power Charging Infrastructure.

DISCUSSION:

The SBMF ZEB Backup Power construction project consists of the installation of photovoltaic panels, a battery energy storage system, and a backup natural gas generator to provide backup power to the ZEB charging infrastructure at SBMF.

In 2024, the SBMF ZEB Phase I construction project was completed, which provided electrical and structural infrastructure to charge twenty-four (24) battery electric buses. As part of the original contract, some add-ons/alternates were contemplated: installation of photovoltaic panels, a battery energy storage system, and a backup natural gas generator. These add-ons/alternate bid items were not executed at the time due to limited available funding.

This project will provide backup power or redundancy to support the charging infrastructure. In the event there is a power loss at SBMF at completion of this project, the natural gas generator could provide the energy needed to charge some buses. The battery energy storage system, which receives energy captured by the photovoltaic panels, could also provide energy needed to charge some buses during a power loss. The management of this self-contained electrical network will be done by a new microgrid energy management system that will be installed in a substation previously installed during the SBMF ZEB Phase I project. The intent of installing this

microgrid is to reduce reliance on the electrical grid, use more renewable energy, offset utility costs, and analyze the efficacy of this equipment for installation at other divisions.

On April 8, 2025, staff issued an Invitation for Bids (IFB) for the SBMF ZEB Backup Power Construction Project. The following single bid was received on May 30, 2025:

COMPANY NAME	FIRM CERTIFICATIONS	BID AMOUNT
G A Abell, Inc. dba Precision Electric Co.	N/A	$6,734,024.00
MTS – Independent Cost Estimate (ICE)		*$6,792,575.80*

MTS had advertised the IFB for two consecutive weeks on a newspaper, posted on PlanetBids, and emailed Disadvantaged Business Enterprise (DBEs) to notify the pre-qualified firms, and as many interested subcontractors and suppliers as possible.

To ascertain that the solicitation was not restrictive, on June 1, 2025, MTS emailed a survey to the pre-qualified firms asking them their reason/s for not bidding. MTS received their responses, which showed that their business reasons led to not bidding. Neither the IFB nor MTS's procurement processes played a role in their decision not to respond. Therefore, competition was considered adequate and MTS proceeded with this as a competitive solicitation.

Based on the bid received, and in comparison with the ICE, MTS staff recommends awarding the contract to G A Abell, Inc. dba: Precision Electric Co. Staff determined the price to be fair and reasonable.

The Contractor will be using the following subcontractors:

SUBCONTRACTOR NAME	FIRM CERTIFICATIONS
Advantage Backhoes L.L.C	Small Business (SB)
MTA Electrical Engineers	SB
Team C Construction	SB
World Bridge Technologies, Inc.	SB
Legacy Reinforcing Steel LLC	SB
JDS Plumbing	N/A
Lightning Protection Systems	N/A
Electric Power Systems International, Inc.	N/A
Cement Cutting Inc	N/A
MZB Engineering and Construction Inc.	N/A

Therefore, staff recommends that the MTS Board of Directors authorize the CEO to execute MTS Doc. No. PWB437.0-25 (in substantially the same format as Attachment A), with G A Abell, Inc. dba Precision Electric Co., for the SBMF ZEB Backup Power Construction Project in the amount of $6,734,024.00 plus 10% contingency.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.45815, Julia.Tuer@sdmts.com

Attachments: A. Draft Agreement PWB437.0-25
B. Scope of Work
C. Bid Costs

Metropolitan Transit System

STANDARD CONSTRUCTION AGREEMENT

FOR

MTS DOC. NO. PWB437.0-25

SOUTH BAY MAINTENANCE FACILITY (SBMF) ZERO EMISSION BUS (ZEB) BACKUP POWER PROJECT

THIS AGREEMENT is entered into this _____ day of _____ 2025, in the State of California by and between San Diego Metropolitan Transit System ("MTS"), a California public agency, and the following, hereinafter referred to as "Contractor":

Name: G A Abell, Inc. dba Precision Electric Co. Address: 8137 Winter Gardens

Lakeside, CA 92040

Form of Business: Corporation
(Corporation, Partnership, Sole Proprietor, etc.)

Email: estimating@pecsd.com

Telephone: _____

Authorized person to sign contracts Adam Cox (Name) General Manager (Title)

The specified Contract Documents are part of this Agreement. The Contractor agrees to furnish to MTS services and materials, as follows:

Contractor shall furnish all necessary management, supervision, labor, materials, tools, supplies, equipment, plant, services, engineering, testing and/or any other act or thing required to diligently and fully perform and complete the Project as specified in accordance with the Standard Agreement and General Conditions (Exhibit A), Scope of Work, Special Conditions and Attachments (Exhibit B), Bid Price Form (Exhibit C), and Forms (Exhibit D).

SCOPE OF WORK.

Contractor, for and in consideration of the payment to be made to Contractor as hereinafter provided, shall furnish all plant, labor, technical and professional services, supervision, materials and equipment, other than such materials and equipment as may be specified to be furnished by MTS, and perform all operations necessary to complete the Work in strict conformance with the Contract Documents (defined below) for the following public work of improvement:

SOUTH BAY MAINTENANCE FACILITY (SBMF) ZERO EMISSION BUS (ZEB) BACKUP POWER PROJECT

Contractor is an independent contractor and not an agent of MTS. The Contractor and its surety shall be liable to MTS for any damages arising as a result of the Contractor's failure to comply with this obligation.

CONTRACT TIME.

Time is of the essence in the performance of the Work. The Work shall be commenced by the date stated in MTS's Notice to Proceed. The Contractor shall complete all Work required by the Contract Documents within **180 calendar days from the commencement date stated in the Notice to Proceed, not including lead time for equipment.** By its signature hereunder, Contractor agrees the Contract Time is adequate and reasonable to complete the Work.

CONTRACT PRICE.

MTS shall pay the Contractor as full compensation for the performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs, the sum of six million, seven hundred thirty-four thousand and twenty-four dollars ($6,734,024.00). Payment shall be made as set forth in the General Conditions.

PROVISIONS REQUIRED BY LAW.

Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents. The Contractor shall comply with all requirements of the California Labor Code applicable to this Project.

INDEMNIFICATION.

Contractor shall provide indemnification as set forth in the General Conditions.

PREVAILING WAGES.

Contractor shall be required to pay the prevailing rate of wages in accordance with the Labor Code which such rates shall be made available at MTS's Administrative Office or may be obtained online at http://www.dir.ca.gov and which must be posted at the job site.

SAN DIEGO METROPOLITAN TRANSIT SYSTEM	**G A ABELL, INC. DBA PRECISION ELECTRIC CO.**
By: _____ Sharon Cooney, Chief Executive Officer **Approved as to form:** **By:** _____ Karen Landers, General Counsel	**By:** _____ **Title:** _____

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 WATER POLLUTION CONTROL - GENERAL

A. Water pollution control work shall conform to the provisions in Section 3.21, "Compliance with Construction General Permit for Construction Activity," of the General Conditions, and these Technical Specifications.

1. The Contractor shall comply with the following permits:

a. State Water Resources Control Board (SWRCB) Order No. 2013-0001-DWQ and National Pollutant Discharge Elimination System (NPDES) Permit No. CAS000004

b. Regional Water Quality Control Board (RWQCB) Order No. R9-2017-0006 and NPDES Permit No. CAS000004

2. The Contractor may obtain other National Pollutant Discharge Elimination System (NPDES) permits that apply to activities and mobile operations within or outside of the project limits including material borrow and/or processing areas, concrete plants, staging areas, storage yards, or access roads.

3. The Contractor shall perform water pollution control work in conformance with the requirements in the California Stormwater Quality Association (CASQA) Construction Best Management Practices Handbook and Water Pollution Control Program (WPCP) Preparation Manual and addenda in effect on the day the Notice to Contractors is dated.

The Preparation Manual and other references for performing water pollution control work are available from the Caltrans' Construction Storm Water and Water Pollution Control website at:
https://dot.ca.gov/programs/construction/storm-water-and-water-pollution-control/manuals-and-handbooks

1.2 CONTRACTOR QUALIFICATIONS

A. The Contractor shall designate in writing a Qualified WPC Preparer who will have required qualifications and training for Qualified SWPPP Developer (QSD) and Qualified SWPPP Practitioner (QSP). The Contractor shall submit a statement of qualifications describing the training, work history, and expertise of the proposed QSD and QSP along with certifications. Contractor shall comply with the training qualifications and certifications requirements defining the QSD and QSP as outlined in the NPDES permit.

B. The development of and revisions/amendments to, the WPCP must be performed by the QSD as defined in the NPDES permit. Installation, monitoring, maintenance, and repair of Best Management Practices (BMPs) shall be performed or supervised by the QSP as defined in the NPDES permit. Stormwater sampling, as required by the NPDES permit and/or the WPCP shall be performed or supervised by the QSP as defined in the NPDES permit. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately but shall ensure adequate deployment.

C. The Contractor's management and supervisory personnel along with contractor and subcontractor workers involved with the placement and maintenance of non-storm and storm water pollution prevention "Best Management Practices" (BMPs) shall be trained on general non-storm and storm water pollution control requirements consistent with the "Construction Site Best Management Practices" and should be commensurate with the job performed by the employee.

1.3 WATER POLLUTION CONTROL PLAN (WPCP) PREPARATION AND SUBMITTAL

A. The Contractor shall prepare and submit a Water Pollution Control Plan (WPCP) to the Engineer for approval. The WPCP shall conform to the requirements in the Preparation Manual, the NPDES permits, and these Technical Specifications.

B. The WPCP shall include Best Management Practices (BMPs):

1. For storm water and non-storm water from areas outside of the job site related to construction activities for this contract such as:
   a. Staging areas.
   b. Storage yards.
   c. Access roads.

C. The WPCP shall include a schedule that:

1. Describes when work activities that could cause water pollution will be performed.
2. Identifies soil stabilization and sediment control practices for disturbed soil area.
3. Includes dates when these practices will be 25, 50, and 100 percent complete.

D. The WPCP shall include the following temporary BMPs and their associated contract items of work as shown on the plans or specified in these Technical Specifications:

1. Temporary Soil Stabilization
2. Temporary Sediment Control
3. Tracking Control
4. Wind Erosion Control
5. Non-Storm Water Management
6. Waste Management and Materials Pollution Control

E. Within 30 days after the notice of award, the Contractor shall submit 3 copies of the WPCP to the Engineer. The Contractor shall allow 20 days for the Engineer's review. If revisions are required, the Engineer will provide comments and specify the date that the review stopped. The Contractor shall revise and resubmit the WPCP within 15 days of receipt of the Engineer's comments. The Engineer's review will resume when the complete WPCP is resubmitted. When the Engineer approves the WPCP, the Contractor shall submit 4 copies of the approved WPCP to the Engineer. The Contractor may

proceed with construction activities if the Engineer conditionally approves the WPCP while minor revisions are being completed. If the Engineer fails to complete the review within the time allowed and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay, the Contractor will be compensated for resulting losses, and an extension of time will be granted, as provided for in Section 4.30, "Time for Completion and Liquidated Damages," of the General Conditions.

F. The Contractor shall not perform work that may cause water pollution until the WPCP has been approved by the Engineer. The Engineer's review and approval shall not waive any contract requirements and shall not relieve the Contractor from complying with Federal, State and local laws, regulations, and requirements.

G. If there is a change in construction schedule or activities, the Contractor shall prepare an amendment to the WPCP to identify additional or revised BMPs. In addition, the WPCP shall be updated for each new phase or stage of the construction project. The Contractor shall submit the amendment to the Engineer for review within a time agreed to by the Engineer not to exceed the number of days specified for the initial submittal of the WPCP. The Engineer will review the amendment within the same time allotted for the review of the initial submittal of the WPCP.

H. If directed by the Engineer or requested in writing by the Contractor and approved by the Engineer, changes to the water pollution control work specified in these Technical Specifications would be allowed. Changes may include addition of new BMPs. The Contractor shall incorporate these changes in the WPCP. Additional water pollution control work will be paid for as extra work in accordance with Section 4.32, "Changes and Extra Work," of the General Conditions.

I. The Contractor shall keep a copy of the approved WPCP at the job site. The WPCP shall be made available when requested by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency, or the local storm water management agency. Requests from the public shall be directed to the Engineer.

1.4 IMPLEMENTATION REQUIREMENTS

A. The Contractor shall construct, inspect, maintain, remove, and dispose of temporary BMPs in accordance with the approved WPCP. The Contractor's responsibility for WPCP implementation shall continue throughout any temporary suspension of work ordered by the Engineer.

A. If the Contractor or the Engineer identifies a deficiency in the implementation of the approved WPCP, the deficiency shall be corrected immediately, unless an agreed date for correction is approved in writing by the Engineer. The deficiency shall be corrected before the onset of precipitation. If the Contractor fails to correct the deficiency by the agreed date or before the onset of precipitation, the owner may correct the deficiency and deduct the cost of correcting deficiencies from payments.

1.5 YEAR ROUND

A. As part of the WPCP, the Contractor shall have a “weather triggered” action plan and have the ability to deploy BMPs as required to completely protect the exposed portion of

the project site within 48 hours of a predicted storm event (50% chance of ½ inch or more rain). The "weather triggered" action plan shall include details for mobilizing sufficient labor and equipment to deploy the BMPs required to protect soil areas prior to the onset of precipitation.

B. The Contractor may discontinue earthwork operations for a disturbed area for up to 21 days and the disturbed soil area will still be considered active. When earthwork operations in the disturbed area have been completed, the Contractor shall implement appropriate BMPs within 15 days, or before predicted precipitation, whichever occurs first.

1.6 RAINY SEASON

A. The Contractor shall provide soil stabilization and sediment control practices during the rainy season between October 1 and April 30.

B. The Contractor shall implement soil stabilization and sediment control practices a minimum of 10 days before the start of the rainy season.

C. The Contractor shall maintain soil stabilization and sediment control materials on site to protect disturbed soil areas.

D. The Contractor shall provide an updated "weather triggered" action plan on a monthly basis at the beginning of each month during the rainy season (October 1st through April 30th). A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to deploy the temporary BMPs required to protect disturbed soil areas prior to the onset of precipitation.

1.7 INSPECTION AND MAINTENANCE

A. The QSP shall inspect the temporary BMPs identified in the WPCP as follows:

1. Before a forecasted storm,
2. After precipitation that causes site runoff,
3. At 24-hour intervals during extended precipitation,
4. On a predetermined schedule, a minimum of once every month outside of the defined rainy season, and
5. On a predetermined schedule, a minimum of once every two weeks during the defined rainy season.
6. On a predetermined schedule, a minimum of once per week during the defined rainy season if a project is located over or within 150 feet of a 303d listed waterbody.
7. Forecasted storm is defined as a 50% chance of ½" or more of rain within 48 hours, as identified by the National Weather Service.

B. The QSP shall oversee the maintenance of the BMPs. The QSP shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Engineer. A copy of the completed site inspection checklist shall be submitted to the Engineer within 24 hours of finishing the inspection. The Engineer shall ensure the site inspections are accurate and complete.

1.8 UNAUTHORIZED DISCHARGES

A. No unauthorized discharges of any material, debris, or pollutant may leave the project site and/or enter the storm water conveyance system including process and wash waters, dust, petroleum products, soil or debris. The Contractor shall be responsible for clean-up, mitigation, and penalties resulting from failure to implement and maintain appropriate BMPs for pollution prevention. Any penalties assessed to the Owner as a result of unauthorized discharges will be withheld from the Contractor's progress payments.

1.9 CLEAN UP

A. All unsalvageable materials used in the storm water pollution prevention program shall be properly disposed of outside of the Owner's property at the completion of work.

1.10 REPORTING REQUIREMENTS

A. If the Contractor identifies discharges into surface waters or drainage systems causing or potentially causing pollution, or if the project receives a written notice or order from a regulatory agency, the Contractor shall immediately inform the Engineer. The Contractor shall submit a written report to the Engineer within 7 days of the discharge, notice or order. The report shall include the following information:

B. The date, time, location, nature of the operation, type of discharge; and the cause of the notice or order.

C. The BMPs used before the discharge, or before receiving the notice or order.

D. The date of placement and type of additional or altered BMPs placed after the discharge, or after receiving the notice or order.

E. A maintenance schedule for affected BMPs.

1.11 ANNUAL CERTIFICATIONS

A. By July 15 of each year, the Contractor shall complete and submit to the Engineer an Annual Certification of Compliance, as contained in the Preparation Manual.

1.12 COST BREAK-DOWN

A. The Contractor shall include a Water Pollution Control Cost Break-Down in the WPCP which itemizes the contract lump sum for water pollution control work.

1.13 RELATIONS WITH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

A. This project lies within the boundaries of the San Diego Regional Water Quality Control Board (RWQCB).

B. This project is subject to the requirements of the current Statewide General Permit issued by the SWRCB entitled "Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity," which regulates discharges of storm water and non-storm water

from construction activities disturbing 0.4-hectare {one acre} or more of soil in a common plan of development. Sampling and analysis requirements as specified in SWRCB Resolution No. 2001-46 are added to the Statewide General Permit. Copies of the Statewide General Permit and modifications thereto are available for review from the SWRCB, Storm Water Permit Unit, 1001 "I" Street, P.O. Box 1977, Sacramento, California 95812-1977, Telephone: (916) 341-5254 and may also be obtained from the SWRCB internet website at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/index.shtml

C. This project shall conform to the permits and modifications thereto. The Contractor shall maintain copies of the permits at the project site and shall make them available during construction.

D. The Contractor shall know and comply with provisions of Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from the project site and areas of disturbance outside the project limits during construction. Attention is directed to Section 3.21, "Compliance with Construction General Permit for Construction Activity," of the General Conditions and Section 3.28, "Protection of Work and Property," of the General Conditions.

E. The Contractor shall be responsible for penalties assessed on the Contractor or the owner as a result of the Contractor's failure to comply with the provisions in this Technical Specification or with the applicable provisions of the Federal, State, and local regulations and requirements. If project documentation, including but not limited to site inspection checklists and correspondence to the contractor, shows that the contractor is in compliance with the project WPCP, the Engineer may waive contractor responsibility for penalties.

F. Penalties as used in this section shall include fines, penalties, and damages, whether proposed, assessed, or levied against the owner or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

1.14 WITHHOLDS

A. The Engineer will withhold money due the Contractor, in an amount determined by the Engineer, up to and including the entire amount of penalties proposed, assessed, or levied as a result of the Contractor's violation of the permits, or Federal or State law, regulations, or requirements. Funds will be withheld by the Engineer until final disposition of penalties has been made. The Contractor shall remain liable for the full amount of penalties until they are finally resolved with the entity seeking the penalties.

B. If a regulatory agency identifies a failure to comply with the permits and modifications thereto, or other Federal, State, or local requirements, the owner will withhold money due the Contractor, subject to the following:

1. The Engineer will give the Contractor 30 days notice of the owner's intention to withhold funds from payments, which may become due to the Contractor

before acceptance of the contract. Funds withheld after acceptance of the contract will be made without prior notice to the Contractor.

2. If the Engineer has withheld funds, and it is subsequently determined that the State is not subject to the entire amount of the costs and liabilities assessed or proposed in connection with the matter for which the withhold was made, the Engineer will be liable for interest on the amount withheld for the period of the withhold. The interest rate payable shall be 6 percent per annum.

C. The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the owner shall provide copies of correspondence, notices of violation, enforcement actions, or proposed fines by regulatory agencies to the requesting regulatory agency.

PART 2 - PRODUCTS

2.1 Product material for temporary BMP elements listed below used during construction shall comply with the approved Water Pollution Control Plan, the Construction Site Best Management Practices (BMP) Manual of the Caltrans Storm Water Quality Handbooks and these Technical Specifications.

PART 3 - EXECUTION

3.1 GENERAL

A. Best Management Practice (BMP) itemized elements are as follows:

1. Temporary Concrete Washout Facility
2. Temporary Drainage Inlet Protection
3. Street Sweeping

3.2 TEMPORARY CONCRETE WASHOUT FACILITY

A. General

1. Temporary concrete washout facilities shall be constructed, maintained, and later removed at the locations shown on the approved Water Pollution Control Plan in conformance with these Technical Specifications, WM-8 in the Construction Site Best Management Practices (BMP) Manual of the Caltrans Storm Water Quality Handbooks, and in conformance with details shown on the plans and these Technical Specifications.
2. Temporary concrete washout facilities shall be one of the BMPs for waste management and materials pollution control. The Water Pollution Control Plan shall include the use of temporary concrete washout facilities.
3. Temporary concrete washout facilities shall be above ground only and comply with Section 13-9, “Temporary Concrete Washouts,” of the Caltrans Standard Specifications and these Technical Specifications.

B. Maintenance

1. Temporary concrete washout facilities shall be maintained to provide adequate

holding capacity with a minimum freeboard of 1 ft. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials shall be removed and disposed of in conformance with authorized removal methods submitted to the Engineer by the Contractor. Holes, rips, and voids in the plastic liner shall be patched and repaired by taping or the plastic liner shall be replaced. Plastic liner shall be replaced when patches or repairs compromise the impermeability of the material as determined by the Engineer.

2. Gravel bags shall be replaced when the bag material is ruptured or when the geotextile has failed, allowing the bag contents to spill out.
3. Temporary concrete washout facility shall be repaired or replaced on the same day when the damage occurs. Damage to the temporary concrete washout facility resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

3.3 TEMPORARY DRAINAGE INLET PROTECTION

A. General

1. Temporary drainage inlet protection shall be constructed, maintained, and later removed at the locations shown on the approved Water Pollution Control Plan in conformance with "Water Pollution Control" of these Technical Specifications, SC-10 in the Construction Site Best Management Practices (BMP) Manual of the Caltrans Storm Water Quality Handbooks, and in conformance with details shown on the plans and these Technical Specifications. Attention is directed to "Water Pollution Control" of these Technical Specifications.
2. Temporary drainage inlet protection shall be one of the BMPs for sediment control. The Water Pollution Control Plan shall include the use of temporary drainage inlet protection.
3. Temporary drainage inlet protection shall be Type 3, unless specified otherwise.

B. Materials

1. Erosion Control Blanket
   a. Erosion control blanket for temporary drainage inlet protection (Type 3) shall be Class 8 geotextile conforming to the provisions in Section 72-2.02C, "Fabric," of the Caltrans Standard Specifications.

2. Staples
   a. Staples for temporary drainage inlet protection (3) shall be as shown on the plans. An alternative attachment device such as geotextile pins or plastic pegs may be used instead of staples. The Contractor shall submit a sample of the alternative attachment device for Engineer's approval prior to installation.

3. Gravel Bag
   a. Gravel bag fabric for temporary drainage inlet protection (Types 3 or 4) shall be non- woven polypropylene geotextile (or comparable polymer) and shall conform to the following requirements:

Specification	Requirements
Mass per unit area, oz per square yd, min. ASTM Designation: D 5261	10
Grab tensile strength (1 inch grip), lbf, min. ASTM Designation: D4632*	200
Ultraviolet stability, percent tensile strength retained after500 hours	70

* or appropriate test method for specific polymer

b. Gravel bags shall be between 2 ft and 2.5 ft in length, and between 1.5 ft and 1.6 ft in width.
c. Yarn used for binding gravel bags shall be as recommended by the manufacturer or bag supplier and shall be of a contrasting color.
d. Gravel shall be between 3/8 inch and ¾ inch in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials. The opening of gravel filled bags shall be secured to prevent gravel from escaping. Gravel-filled bags shall be between 30 lbs and 50 lbs in weight.

C. Installation

1. Temporary drainage inlet protection shall be installed at drain inlets in paved and unpaved areas as follows:
2. Temporary drainage inlet protection shall be installed such that ponded runoff does not encroach into the traveled way or overtop the curb or dike. Gravel-filled bags shall be placed to control ponding and prevent runoff from overtopping the curb or dike.
3. The bedding area for the temporary drainage inlet protection shall be cleared of obstructions including, but not limited to, rocks, clods, and debris greater than 1 inch in diameter prior to installation.
4. Erosion control blanket or geotextile fabric shall be secured with staples and embedded into a trench adjacent to the drainage inlet. Gravel-filled bags shall be staked in rows two layers high in a pyramid configuration to form a gravel bag barrier centered over the perimeter of the erosion control blanket or geotextile fabric. The gravel-filled bags shall be placed so that the bags are tightly abutted and overlap the joints in adjacent rows. A spillway shall be created by removing one or more gravel-filled bags from the upper layer of the gravel bag barrier.
5. The Contractor shall select the appropriate drainage inlet protection in conformance with the details to meet the field condition around the drainage inlet. For all other drainage inlets within the project limits that do not conform to the details shown on the plans, the Contractor shall submit to the Engineer for approval, provisions for providing temporary drainage inlet protection.
6. Details for an alternative temporary drainage inlet protection shall be submitted to the Engineer for approval at least 7 days prior to installation.
7. Throughout the duration of the Contract, the Contractor shall be required to provide protection to meet the changing condition of the drainage inlet.
8. In areas adjacent to traffic where temporary railing (Type K) is not present temporary drainage protection (Type 3A) and (Type 3B) shall not be used.
9. When the temporary drainage inlet protections are no longer required, temporary

drainage inlet protection materials shall be removed and disposed of in conformance with Federal, State, and local regulations.

10. Holes, depressions or other ground disturbance caused by the removal of the temporary drainage inlet protection shall be backfilled and repaired in conformance with the provisions in Section 3.28, "Protection of Work and Property," of the General Conditions.

D. Maintenance

1. Temporary drainage inlet protection shall be maintained to provide sediment holding capacity and to reduce runoff velocities and as follows:
2. Gravel-filled bags shall be replaced when the bag material ruptures and allows the contents to spill out, or when the geotextile fails and allows the bag contents to spill out.
3. Locations where rills and other evidence of concentrated runoff have occurred beneath the gravel bag barriers shall be corrected.
4. Sediment deposits, trash and debris shall be removed from temporary drainage inlet as described in this special provision or as directed by the Engineer. Removed sediment shall be deposited within the project limits in such a way that the sediment is not subject to erosion by wind or by water. Trash and debris shall be removed and disposed of in conformance with Federal, State, and local regulations.
5. Temporary drainage inlet protection (Type 3): Sediment deposits shall be removed when the deposit reaches one-third the height of the gravel bag barrier or one-half the height of the spillway; whichever is less.
6. Temporary Drainage Inlet Protection shall be repaired or replaced on the same day when the damage occurs. Damage to the temporary drainage inlet protection resulting from the Contractor's vehicles, equipment, or operations shall be repaired at the Contractor's expense.

3.4 STREET SWEEPING

A. General

1. Street sweeping shall be conducted where sediment is tracked from the project site onto paved roads.
2. Street sweeping shall be one of the BMPs for sediment control. The Water Pollution Control Plan shall include the use of street sweeping. Street sweeping shall be performed in conformance with Section 4, SC-7 in the Construction Site Best Management Practices (BMP) Manual of the Caltrans Storm Water Quality Handbooks.
3. Material collected during street sweeping operations shall be disposed of in accordance with Federal, State, and local regulations.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Unless otherwise indicated Temporary Storm Water Pollution Control shall be measured as lump sum.

4.2 PAYMENT

A. The contract lump sum price paid for Temporary Storm Water Pollution Control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Temporary Storm Water Pollution Control During Construction including preparation of WPCP, complying with WPCP and regulatory requirements, installing, constructing, maintaining, removing, and disposing of temporary construction BMPs, including non-storm water management, and waste management and materials pollution BMPs, as specified in the Caltrans Standard Specifications, these Technical Specifications, as directed by the Engineer, and as indicated below:

B. During each estimate period the Contractor fails to conform to the provisions in this section or fails to implement the BMPs outlined in the WPCP or specified elsewhere in these Technical Specifications as items of work, the owner may withhold 25 percent of the progress payment.

1. Failure to implement practices may include, but are not limited to, the following:
   a. Observation of non-storm water discharges without proper BMP implementation observation of erosion due to missing or improperly implemented soil stabilization and sediment control BMPs.
   b. Failure to submit an updated WPCP for a new phase or stage.
   c. Failure to amend the WPCP when a change in project conditions occurs or when BMP deficiencies are identified.
   d. Failure to implement required erosion and sediment control BMPs on active and/or inactive disturbed soil areas.
   e. Failure to maintain a stockpile of BMPs for installation prior to a rain event.
   f. Failure to maintain BMPs in the field.
   g. Failure to perform appropriate site inspections.
   h. Failure to implement the project's Sampling and Analysis Plan.
   i. Failure to install or maintain BMPs as described in the WPCP and in the Maintenance sections of these Technical Specifications.

2. Withholds for failure to perform water pollution control work will be in addition to all other withholds provided for in the contract. The owner will return performance-failure withholds in the progress payment following the correction of noncompliance.
3. Implementation of temporary BMPs in areas outside the MTS right of way not specifically provided for in the WPCP or in these Technical Specifications will not be paid for.

END OF SECTION

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SECTION 01 71 23

CONSTRUCTION STAKING AND SURVEYING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Construction Staking and Surveying

1.2 RELATED SECTIONS

Not Used

1.3 REFERENCE STANDARDS

A. Caltrans Standard Specifications, Current Edition

1. Section 5-1.26, "Construction Surveys"
2. Caltrans Surveys Manual, Chapter 12, dated November 2012

1.4 SUBMITTALS

Not Used

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 CONSTRUCTION STAKING AND SURVEYING

A. Construction staking shall be in conformance with Chapter 12 of the Caltrans Surveys Manual, dated November 2012. Legible copies of all construction operations staking sheets shall be provided to Engineer two days before construction work is started.

B. All field construction surveying required for accurate location and the construction of the various items of work under the contract shall be performed and furnished by the Contractor.

C. The contractor shall be responsible for performing a site verification survey to confirm the existing grades and conditions at the site prior to any grading or construction operations. The survey data shall be overlaid electronically, in AutoCAD format, on the original ground as shown on the project plans, and any variations brought to the attention of the Engineer.

D. The Contractor shall notify the Engineer, in writing, 48 hours in advance of any

construction staking.

E. The Contractor shall replace any disturbed existing property corner markers, monuments, and local agencies' well monuments disturbed during construction operations. These new markers, monuments, and well monuments shall be documented by a record of survey map or corner record prepared in accordance with Section 8771 of the Business and Professions Code and all applicable laws and regulations and filed in the Office of the County Recorder of San Diego County at the Contractor's expense.

F. The Contractor shall be responsible for preparing and filing with the San Diego County surveyor a Corner Record of the references to existing monuments within the area of each street or highway to be reconstructed under this contract, prior to any reconstruction, as required by Section 8771 of the Business and Professions Code (January 1, 1995).

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Construction Staking and Surveying will be measured for payment as a lump sum.

4.2 PAYMENT

A. Construction Staking and Surveying furnished and completed in accordance with the Contract Documents will be paid at the Contract Price, as listed on the Bid Item List. This price shall include full compensation for furnishing all labor materials, tools, equipment, supplies, supervision, and incidentals, and doing the work, as specified in the Contract Documents, and as directed by the Engineer.

END OF SECTION

SECTION 02 41 00

DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Pavement Demolition

B. Removal of Above Ground Surface Improvements

1.2 RELATED SECTIONS

Not Used

1.3 REFERENCE STANDARDS

A. Caltrans Standard Specifications, Current Edition

1. Section 5-1.36, "Property and Facility Preservation"

2. Section 10-6, "Watering"

3. Section 18, "Dust Palliative"

1.4 SUBMITTALS

A. Submit a demolition work plan to the Engineer detailing the procedures planned and proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, careful removal of materials to be demolished, protection of property which is to remain undisturbed, proper disposal of generated material, and timely coordination with MTS for the disconnection of utility services. The plan shall include a detailed description of the methods and equipment to be used for each operation, hazardous materials disposal, disposal facilities selected, and the sequence of operations.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 DEMOLITION

A. Remove Existing Asphalt. Existing asphalt pavement, including base material, shown on the plans to be removed shall be sawcut and removed to bottom of existing pavement surface (assumed 20" depth) for trenching. The adjacent 2 feet will be milled to a depth indicated on plans. Resulting holes and depressions shall be repaved per

the lines and grade established by the Engineer. Residue from saw cutting operations shall be removed from the pavement surface by vacuuming or other approved method and shall not be allowed to flow across the pavement nor be left on the surface of the pavement. Residue from saw cutting operations shall be disposed of outside the project right-of-way. Contractor-Property owner agreements for disposal shall conform to the provisions in Section 5-1.20B(4), “Contractor-Property Owner Agreement” of the Caltrans Standard Specifications.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Sawcut shall be measured by lineal foot of sawcut to a length and depth prescribed on the construction plans.

B. Remove Existing Asphalt shall be measured by the square foot of asphalt removed to a depth of 20 inches below existing grade and horizontally to the limits shown in the construction plans.

4.2 PAYMENT

A. Sawcut shall be paid by the lineal foot of sawcut to a length and depth prescribed on the construction plans. This shall include full compensation for all all the work, labor, equipment and incidentals required to remove, stockpile and legally dispose of as required.

B. Remove Existing Asphalt shall be paid by the square foot of asphalt removed to the bottom of existing pavement section, including base (assume 20 inches). This shall include full compensation for all the work, labor, equipment and incidentals required to remove asphalt pavement and base, stockpile, and legally dispose of as required.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Conveying and placing concrete.

B. Consolidation.

C. Construction joints.

D. Expansion and contraction joints.

E. Curing and protection.

1.2 RELATED SECTIONS - Not Used

1.3 REFERENCE STANDARDS

A. American Concrete Institute (ACI):

1. ACI 117 Specification for Tolerances for Concrete Construction and Materials and Commentary
2. ACI 301 Specifications for Structural Concrete
3. ACI 302.1R Guide for Concrete Floor and Slab Construction
4. ACI 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete
5. ACI 305R Guide to Hot Weather Concreting
6. ACI 306.1 Standard Specification for Cold Weather Concreting
7. ACI 308R Guide to Curing Concrete
8. ACI 309R Guide for Consolidation of Concrete
9. ACI 318 Building Code Requirements for Structural Concrete and Commentary
10. ACI 503.2 Standard Specification for Bonding Plastic Concrete to Hardened Concrete with a Multi-Component Epoxy Adhesive

B. Standard Specifications for Public Works Construction (Greenbook), Current Edition:

1. ASTM C31Standard Practice of Making and Curing Concrete Test Specimens in the Field
2. ASTM C94Standard Specification for Ready-Mixed Concrete
3. ASTM C881 Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

1.4 SUBMITTALS

A. Shop Drawings:

1. Submit drawings that indicate the locations of all joints in concrete, including construction joints, expansion joints, isolation joints, and contraction joints.

Indicate concrete placement schedule, method, sequence, location, and boundaries. Include each type and class of concrete, and quantity in cubic yards.

B. Product Data: Submit manufacturer's product data for epoxy adhesive.

C. Records and Reports: Report the location in the finished work of each mix design, and the start and completion times of placement of each batch of concrete placed for each date concrete is placed.

1.5 QUALITY CONTROL

A. Tolerances:

1. Concrete Tolerances: Comply with the requirements of ACI 117 as applicable.

B. Cold Joints: Cold joints in concrete will not be permitted unless planned and treated properly as construction joints.

A. Monitoring of Formwork: Provide monitoring of forms and embedded items to detect movement, or forms and embedded items out-of-alignment, from pressure of concrete placement.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Delivering and placing of concrete in hot weather and cold weather shall comply with applicable requirements of ACI 305R and ACI 301.1.

B. Do not place concrete when the rate of evaporation of surface moisture from concrete exceeds 0.2 pound per square foot per hour as indicated in Figure 2.1.5 of ACI 305R.

C. Do not place concrete in, or adjacent to, any structure where piles are required until all piles in the structure have been driven or installed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland Cement Concrete: Minor concrete per Caltrans Standard Specifications Section 90-2, “Minor Concrete.”

B. Reinforcing Steel: Refer to Section 52, “Reinforcement,” of the Caltrans Standard Specifications.

C. Concrete Curing Compounds: Curing compound shall be water-based, V.O.C. compliant, clear, non-staining and shall not inhibit the bond or performance of bonding agents, grouts, sealers or other coatings & toppings that will later be applied to the concrete surface.

1. Acceptable materials include:
   a. Atlas Quantum-Cure, as manufactured by Atlas Tech Products, San Diego, CA
   b. Conspec 21, as manufactured by Conspec, Kansas City, KS

D. Epoxy Adhesive: ASTM C881, Type II for non-load-bearing concrete and Type V for load-bearing concrete, Grade and Class as determined by project conditions and requirements.

E. Bonding Agent: Bonding agent shall be a 100% solids, two-component, highmodulus, moisture tolerant epoxy bonding agent conforming to ASTM C-881, Type I, II & V, Grade 2, Class B & C.

1. Acceptable materials include:
   a. Sikadur 32 Hi Mod, as manufactured by Sika Corporation, Lyndhurst, NJ
   b. Atlas LPL Epoxy Bonder, as manufactured by Atlas Tech Products, San Diego, CA

F. Joint Filler: Shall be premolded, nonextruding and resilient filler and comply with Section 201-3, “Expansion Joint filler and Joint Sealants,” of the SSPWC. Joint filler shall be sized for application including height leaving space for backer rod and sealant as shown on the Plans. Joint filler with removable tops (caps) are allowed provided proper space is provided after removal for the backer rod and joint sealant.

G. Joint Sealant: Low modulus silicone or polyurethane joint sealant shall be furnished in a one-part formulation. Acid cure sealants shall not be used. The compound shall be compatible with the surface to which it is applied, match the color of the adjacent paving and shall be installed according to the manufacturer's requirements.

1. Acceptable materials include:
   a. Vulkem 45 Sealant, as manufactured by Tremco, Beachwood, OH, (216) 292-5000
   b. Pecora – NR-201 as manufactured by Pecora Corporation, 800-355-8817

2. The joint sealant shall be formulated to cure rapidly enough to prevent flow after application on grades of up to 15 percent.
3. Contractor shall submit a Certificate of Compliance for the joint sealant to the Engineer prior to installation. The Certificate shall also be accompanied with a certified test report of the results of the required tests performed on the sealant material within the previous 12 months prior to proposed use. The Certificate and accompanying test report shall be provided for each lot of silicone joint sealant prior to use on the project.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect forms, earth bearing surfaces, reinforcement, and embedded items, and obtain the written approval in accordance with the Contractor's Quality Management Plan before placing concrete. Complete and sign a pour card on the form acceptable to the Contracting Officer. The Contractor‘s engineer shall countersign the card prior to commencing the pour.

3.2 PREPARATION

A. Place concrete under the observation of the Contractor's engineer and with the Contractor's Quality Control Representative present to document requirements and results of the placement.

B. Do not place concrete until conditions and facilities for the storage, handling, and transportation of concrete test specimens are in compliance with the requirements of ASTM C31.

C. Prior to placement of concrete, the subgrade shall be in a firm, well-drained condition, and of adequate and uniform load-bearing nature to support construction personnel, construction materials, construction equipment, and steel reinforcing mats without tracking, rutting, heaving, or settlement. All weak, soft, saturated, or otherwise unsuitable material shall be removed and replaced with structural backfill or lean concrete.

D. Earth bottoms or bearing surfaces for footings and slabs shall be dampened but not saturated or muddied just before placing concrete.

3.3 TRANSPORTING

A. Concrete shall be central-mixed concrete from a central batch plant, transported to the jobsite in a truck mixer, in accordance with the requirements specified in ASTM C94.

A. Transport concrete to the jobsite in a manner that will assure efficient delivery of concrete to the point of placement without adversely altering specified properties with regard to water-cement ratio, slump, air entrainment, and homogeneity.

3.4 CONVEYING AND PLACING

A. Placement Standards: Conveying and placing of concrete shall comply with applicable requirements of ACI 301, ACI 302.1R, ACI 304R, and ACI 318.

B. Handling and Depositing:

1. Concrete placing equipment shall have sufficient capacity to provide a placement rate that will preclude cold joints and that shall deposit the concrete without segregation or loss of ingredients.
2. Concrete placement, once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.
3. Concrete shall be handled as rapidly as practicable from the mixer to the place of final deposit by methods that prevent the separation or loss of ingredients. Concrete shall be deposited, as nearly as practicable, in its final horizontal position to avoid redistribution or flowing.
4. Concrete shall not be dropped freely where reinforcing will cause segregation, nor shall it be dropped freely more than 5 feet. Concrete shall be deposited to maintain a plastic surface approximately horizontal.
5. Concrete that has partially hardened shall not be deposited in the work. The discharge of concrete shall be started not later than 60 minutes after the introduction of mixing water. Placing of concrete shall be completed within 90 minutes after the first introduction of water into the mix.

3.5 CONSOLIDATION

A. Concrete shall be thoroughly consolidated and compacted by mechanical vibration during placement in accordance with the requirements of ACI 309R.

B. Concrete placement shall be inspected in accordance with Contractor's Quality Management Plan to confirm that proper placing methods are being employed, and that special techniques are being used in congested areas and around obstructions such as pipes and other embedded items. Check installation of embedded items for correct location and orientation during concrete placement.

C. Conduct vibration in a systematic manner by competent, skilled, and experienced workers, with regularly maintained vibrators, and with sufficient back-up units at the jobsite. Use the largest and most powerful vibrator that can be effectively operated in the given work, with a minimum frequency of 8,000 vibrations or impulses per minute, and of sufficient amplitude to effectively consolidate the concrete.

D. Insert and withdraw the vibrator vertically at uniform spacing over the entire area of the placement. Space the distance between insertions such that "spheres of influence" of each insertion overlap.

E. Conduct vibration so as to produce concrete that is of uniform texture and appearance, free of honeycombing, air and rock pockets, streaking, cold joints, and visible lift lines.

F. On vertical surfaces and on all architectural concrete where an as-cast finish is required, use additional vibration and spading as required to bring a full surface of mortar against the forms, so as to eliminate objectionable air voids, bug holes, and other surface defects. Additional procedures for vibrating concrete shall consist of the following:

1. Reduce the distance between internal vibration insertions and increase the time for each insertion.
2. Insert the vibrator as close to the face of the form as possible, without contacting the form.
3. Use spading as a supplement to vibration at forms to provide fully filled out form surfaces without air holes and rock pockets.
4. Provide vibration of forms only if approved by the Contractor's engineer for the location.

3.6 CONSTRUCTION JOINTS

A. Construction joints will be permitted only where indicated or approved by the Contractor's engineer.

B. Provide and prepare construction joints in accordance with the applicable requirements of ACI 301 and ACI 304R.

C. Make construction joints straight and as inconspicuous as possible, and in exact vertical and horizontal alignment with the structure, as the case may be.

D. Use approved key, at least 1-1/2 inches in depth, at joints unless otherwise indicated or approved by the Contractor's engineer.

E. Thoroughly clean the surface of the concrete at construction joints and remove laitance, loose or defective concrete, coatings, sand, sealing compound and other foreign material. Prepare surfaces of joints by sandblasting or other approved methods to remove laitance and expose aggregate uniformly.

F. Immediately before new concrete is placed, wet the joint surfaces and remove standing water. To allow for shrinkage, do not place new concrete against the hardened concrete side of a construction joint for a minimum of 72 hours.

G. Locate joints that are not indicated so that the strength of the structure is not impaired. Joint types and their locations shall be reviewed and approved by the Contractor's engineer prior to concrete placement.

H. Ensure that reinforcement is continuous across construction joints.

I. Where bonding of the joint is required, provide epoxy adhesive hereinbefore specified and apply in accordance with ACI 503.2.

J. Retighten forms and dampen concrete surfaces before concrete placing is continued.

K. Allow at least 72 hours to elapse before continuing concrete placement at a construction joint. Approval for accelerating the minimum time elapsing between adjacent placements will be based on tests and methods that confirm that a minimum moisture loss at a relatively constant temperature will be maintained for the period as necessary to control the heat of hydration and hardening of concrete, and to prevent shrinkage and thermal cracking.

3.7 EXPANSION AND CONTRACTION JOINTS

A. The joint sealant detail for transverse and longitudinal joints, as shown on the plans, shall apply to all weakened plane joints. All weakened plane joints shall be constructed by the sawing method unless otherwise shown on plans. Should grinding or grooving be required over or adjacent to any joint after sealant has been placed, the joint materials shall be completely removed and replaced at the Contractor's expense. All joints shall have a sealant recessed below the final finished surface as shown on the plans.

B. Seven days after the concrete pavement placement and not more than 4 hours before placing joint filler, backer rods and joint sealant materials, the joint walls shall be cleaned by means as necessary to completely remove from the joint all objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, all traces of sand, dust and loose material shall be removed from and near the joint for a distance along the pavement surfaces of at least 2 inches on each side of the joint by the use of a vacuum device. Surface moisture shall be removed at the joints by means of compressed air or moderate hot compressed air or other means approved by the Engineer. Drying procedures that leave a residue or film on the joint wall shall not be used. Sandblasting equipment shall have a maximum nozzle diameter size of 0.24 in ±0.04 in and a minimum pressure of 90 psi.

C. Joint filler and backer rod shall be installed as shown on the plans. Joint filler and backer rod shall be installed when the temperature of the Portland Concrete Pavement is above the dew point of the air and when the air temperature is 400F (4°C) or above. Joint filler and backer rod shall be installed when the joints to be sealed have been properly

patched, cleaned and dried, as determined by the Engineer. Methods of placing joint filler and backer rod that leave a residue or film on the joint walls, shall not be used.

D. Immediately after placement of joint filler and backer rod, joint sealant shall be placed in the clean, dry, prepared joints as shown on the plans. The joint sealant shall be applied by a mechanical device with a nozzle shaped to fit inside the joint to introduce the sealant from inside the joint. Adequate pressure shall be applied to the sealant to ensure that the sealant material is extruded evenly and that full continuous contact is made with the joint walls. After application of the sealant the surface of the sealant shall be recessed as shown on the plans.

E. Any failure of the joint material in either adhesion or cohesion of the material will be cause for rejection of the joint. The finished surface of joint sealant shall conform to the dimensions and allowable tolerances shown on the plans. Rejected joint materials or joint material whose finished surface does not conform to the dimensions shown on the plans, as determined by the Engineer, shall be repaired or replaced, at the Contractor's expense, with joint material that conforms to the requirements.

F. After each joint is sealed, all surplus joint sealer on the pavement surface shall be removed. Traffic shall not be permitted over the sealed joints until the sealant is tack free and set sufficiently to prevent embedment of debris into the sealant.

3.8 CURING AND PROTECTION

A. Curing of concrete shall comply with applicable requirements of ACI 308R.

B. Immediately upon removal of forms, an approved curing compound shall be applied to exposed concrete surfaces.

C. Protect concrete from injurious action of the elements and defacement of any kind. Protect exposed concrete corners from traffic or use that will damage them in any way.

D. Protect concrete during the curing period from mechanical and physical stresses that may be caused by heavy equipment movement, subjecting the concrete to load stress, load shock, or excessive vibration.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Cast-in-Place Concrete (Minor Concrete) shall be measured by the cubic yard.

4.2 PAYMENT

A. The contract price paid per cubic yard for Cast-in-Place Concrete (Minor Concrete) for the Concrete Pad shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing cast-in-place concrete, complete in place, including subgrade preparation, reinforcement, dowels, PVC pipe extension, finish and formwork, and curing as specified in these Technical Specifications, the Plans, and as directed by the Engineer.

END OF SECTION

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 DESCRIPTION

A. The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

B. The requirements of this Section apply to all sections of Division 23.

C. Definitions:

1. Exposed: Piping, ductwork, and equipment exposed to view in finished rooms.

2. Exterior: Piping, ductwork, and equipment exposed to weather be it temperature, humidity, precipitation, wind, or solar radiation.

D. Abbreviations/Acronyms:

1. ac: Alternating Current

2. AC: Air Conditioning

3. ACU: Air Conditioning Unit

4. ACR: Air Conditioning and Refrigeration

5. AI: Analog Input

6. AISI: American Iron and Steel Institute

7. AO: Analog Output

8. ASJ: All Service Jacket

9. AWG: American Wire Gauge

10. BACnet: Building Automation and Control Networking Protocol

11. BAg: Silver-Copper-Zinc Brazing Alloy

12. BAS: Building Automation System

13. BCuP: Silver-Copper-Phosphorus Brazing Alloy

14. bhp: Brake Horsepower

15. Btu: British Thermal Unit
16. Btu/h: British Thermal Unit Per Hour
17. CDA: Copper Development Association
18. C: Celsius
19. CD: Compact Disk
20. CFM: Cubic Foot Per Minute
21. CH: Chilled Water Supply
22. CHR: Chilled Water Return
23. CLR: Color
24. CO: Carbon Monoxide
25. COR: Contracting Officer's Representative
26. CPD: Condensate Pump Discharge
27. CPM: Cycles Per Minute
28. CPVC: Chlorinated Polyvinyl Chloride
29. CRS: Corrosion Resistant Steel
30. CTPD: Condensate Transfer Pump Discharge
31. CTPS: Condensate Transfer Pump Suction
32. CW: Cold Water
33. CWP: Cold Working Pressure
34. CxA: Commissioning Agent
35. dB: Decibels
36. dB(A): Decibels (A weighted)
37. DDC: Direct Digital Control
38. DI: Digital Input
39. DO: Digital Output
40. DVD: Digital Video Disc
41. DN: Diameter Nominal

42. DWV: Drainage, Waste and Vent
43. EPDM: Ethylene Propylene Diene Monomer
44. EPT: Ethylene Propylene Terpolymer
45. ETO: Ethylene Oxide
46. F: Fahrenheit
47. FAR: Federal Acquisition Regulations
48. FD: Floor Drain
49. FED: Federal
50. FG: Fiberglass
51. FGR: Flue Gas Recirculation
52. FOS: Fuel Oil Supply
53. FOR: Fuel Oil Return
54. FSK: Foil-Scrim-Kraft facing
55. FWPD: Feedwater Pump Discharge
56. FWPS: Feedwater Pump Suction
57. GC: Chilled Glycol Water Supply
58. GCR: Chilled Glycol Water Return
59. GH: Hot Glycol Water Heating Supply
60. GHR: Hot Glycol Water Heating Return
61. gpm: Gallons Per Minute
62. HDPE: High Density Polyethylene
63. Hg: Mercury
64. HOA: Hands-Off-Automatic
65. hp: Horsepower
66. HPS: High Pressure Steam (414 kPa (60 psig) and above)
67. HPR: High Pressure Steam Condensate Return
68. HW: Hot Water

69. HWH: Hot Water Heating Supply
70. HWHR: Hot Water Heating Return
71. Hz: Hertz
72. ID: Inside Diameter
73. IPS: Iron Pipe Size
74. kg: Kilogram
75. klb: 1000 lb
76. kPa: Kilopascal
77. lb: Pound
78. lb/hr: Pounds Per Hour
79. L/s: Liters Per Second
80. L/min: Liters Per Minute
81. LPS: Low Pressure Steam (103 kPa (15 psig) and below)
82. LPR: Low Pressure Steam Condensate Gravity Return
83. MAWP: Maximum Allowable Working Pressure
84. MAX: Maximum
85. MBtu/h: 1000 Btu/h
86. MBtu: 1000 Btu
87. MED: Medical
88. m: Meter
89. MFG: Manufacturer
90. mg: Milligram
91. mg/L: Milligrams Per Liter
92. MIN: Minimum
93. MJ: Megajoules
94. ml: Milliliter
95. mm: Millimeter

96. MPS: Medium Pressure Steam (110 kPa (16 psig) through 414 kPa (60 psig))
97. MPR: Medium Pressure Steam Condensate Return
98. MW: Megawatt
99. NC: Normally Closed
100. NF: Oil Free Dry (Nitrogen)
101. Nm: Newton Meter
102. NO: Normally Open
103. NOx: Nitrous Oxide
104. NPT: National Pipe Thread
105. NPS: Nominal Pipe Size
106. OD: Outside Diameter
107. OSD: Open Sight Drain
108. OS&Y: Outside Stem and Yoke
109. PC: Pumped Condensate
110. PID: Proportional-Integral-Differential
111. PLC: Programmable Logic Controllers
112. PP: Polypropylene
113. PPE: Personal Protection Equipment
114. ppb: Parts Per Billion
115. ppm: Parts Per Million
116. PRV: Pressure Reducing Valve \
117. PSIA: Pounds Per Square Inch Absolute
118. psig: Pounds Per Square Inch Gauge
119. PTFE: Polytetrafluoroethylene
120. PVC: Polyvinyl Chloride
121. PVDC: Polyvinylidene Chloride Vapor Retarder Jacketing, White

122. PVDF: Polyvinylidene Fluoride
123. rad: Radians
124. RH: Relative Humidity
125. RO: Reverse Osmosis
126. rms: Root Mean Square
127. RPM: Revolutions Per Minute
128. RS: Refrigerant Suction
129. RTD: Resistance Temperature Detectors
130. RTRF: Reinforced Thermosetting Resin Fittings
131. RTRP: Reinforced Thermosetting Resin Pipe
132. SCFM: Standard Cubic Feet Per Minute
133. SPEC: Specification
134. SPS: Sterile Processing Services
135. STD: Standard
136. SDR: Standard Dimension Ratio
137. SUS: Saybolt Universal Second
138. SW: Soft water
139. SWP: Steam Working Pressure
140. TAB: Testing, Adjusting, and Balancing
141. TDH: Total Dynamic Head
142. TEFC: Totally Enclosed Fan-Cooled
143. TFE: Tetrafluoroethylene
144. THERM: 100,000 Btu
145. THHN: Thermoplastic High-Heat Resistant Nylon Coated Wire
146. THWN: Thermoplastic Heat & Water-Resistant Nylon Coated Wire
147. T/P: Temperature and Pressure
148. USDA: U.S. Department of Agriculture

149. V: Volt

150. VAC: Vacuum

151. VA: Veterans Administration

152. VAC: Voltage in Alternating Current

153. VA CFM: VA Construction & Facilities Management

154. VA CFM CSS: VA Construction & Facilities Management, Consulting Support Service

155. VAMC: Veterans Administration Medical Center

156. VHA OCAMES: Veterans Health Administration - Office of Capital Asset Management Engineering and Support

157. VR: Vacuum condensate return

158. WCB: Wrought Carbon Steel, Grade B

159. WG: Water Gauge or Water Column

160. WOG: Water, Oil, Gas

1.2 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."

2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. HVAC Mechanical Systems Welding: Before any welding is performed, Contractor shall submit a certificate certifying that welders comply with the following requirements:

1. Qualify welding processes and operators for piping according to ASME BPVC Section IX. Provide proof of current certification.

2. Comply with provisions of ASME B31 series "Code for Pressure Piping".

3. Certify that each welder and welding operator has passed American Welding Society (AWS) qualification tests for the welding processes involved, and that certification is current.

4. All welds shall be stamped according to the provisions of the AWS or ASME as required herein and by the associated code.

D. Electrical Characteristics for Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

E. Meet all Owner, OSHA, state, and local safety requirements.

F. To meet the Owner goals of safety, reliability, serviceability, and efficient operation.

G. All work to meet local plumbing code. In the case of discrepancies between the project contract documents and the local code, the most stringent shall govern.

H. Comply with most current edition of Owner Design Standards.

I. All materials and installations shall meet applicable FM Global requirements.

J. Complete Project Closeout list, Pre-Occupancy checklist, and Project Turnover checklist prior to project turnover to Owner.

K. Mechanical, electrical and associated systems shall be safe, reliable, efficient, durable, easily and safely operable and maintainable, easily and safely accessible, and in compliance with applicable codes as specified. The systems shall be comprised of high quality institutional-class and industrial-class products of manufacturers that are experienced specialists in the required product lines. All construction firms and personnel shall be experienced and qualified specialists in industrial and institutional HVAC.

L. Equipment Vibration Tolerance:

1. Refer to Section 23 05 41, NOISE AND VIBRATION CONTROL FOR HVAC PIPING and EQUIPMENT. Equipment shall be factory-balanced to this tolerance and re-balanced on site, as necessary.

2. After HVAC air balance work is completed and permanent drive sheaves are in place, perform field mechanical balancing and adjustments required to meet the specified vibration tolerance.

M. Products Criteria:

1. Standard Products: Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products for at least 3 years (or longer as specified elsewhere). The design, model and size of each item shall have been in satisfactory and efficient operation on at least three installations for approximately three years. However, digital electronics devices, software and systems such as controls, instruments, computer workstation, shall be the current generation of technology and basic design that has a proven satisfactory

service record of at least three years. See other specification sections for any exceptions and/or additional requirements.

2. Refer to all other sections for quality assurance requirements for systems and equipment specified therein.

3. All items furnished shall be free from defects that would adversely affect the performance, maintainability and appearance of individual components and overall assembly.

4. The products and execution of work specified in Division 23 shall conform to the referenced codes and standards as required by the specifications. Local codes and amendments shall be enforced, along with requirements of local utility companies. The most stringent requirements of these specifications, local codes, or utility company requirements shall always apply. Any conflicts shall be brought to the attention of the COR.

5. Multiple Units: When two or more units of materials or equipment of the same type or class are required, these units shall be of the same manufacturer and model number, or if different models are required, they shall be of the same manufacturer and identical to the greatest extent possible (i.e., same model series).

6. Assembled Units: Performance and warranty of all components that make up an assembled unit shall be the responsibility of the manufacturer of the completed assembly.

7. Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.

8. Use of asbestos products or equipment or materials containing asbestos is prohibited.

N. HVAC Equipment Service Providers: Service providers shall be authorized and trained by the manufacturers of the equipment supplied. These providers shall be capable of responding onsite and provide acceptable service to restore equipment operations within 8 hours of receipt of notification by phone, e-mail or fax in event of an emergency, such as the shutdown of equipment; or within 24 hours in a non- emergency. Submit names, mail and e-mail addresses and phone numbers of service personnel and companies providing service under these conditions for (as applicable to the project): fans, air handling units, chillers, cooling towers, control systems, pumps, critical instrumentation, computer workstation and programming.

O. Manufacturer's Recommendations: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the COR with submittals. Installation of the item will not be allowed to proceed until the recommendations are received.

Failure to furnish these recommendations can be cause for rejection of the material and removal by the Contractor and no additional cost or time to the Government.

P. Execution (Installation, Construction) Quality:

1. Apply and install all items in accordance with manufacturer's written instructions. Refer conflicts between the manufacturer's instructions and the contract documents to the COR for resolution. Provide written hard copies and computer files on CD or DVD of manufacturer's installation instructions to the COR with submittals prior to commencing installation of any item. Installation of the item will not be allowed to proceed until the recommendations are received and approved by the Owner. Failure to furnish these recommendations is a cause for rejection of the material.

2. All items that require access, such as for operating, cleaning, servicing, maintenance, and calibration, shall be easily and safely accessible by persons standing at floor level, or standing on permanent platforms, without the use of portable ladders. Examples of these items include, but are not limited to, all types of valves, filters and strainers, transmitters, control devices. Prior to commencing installation work, refer conflicts between this requirement and contract documents to the COR for resolution. Failure of the Contractor to resolve or point out any issues will result in the Contractor correcting at no additional cost or time to the Owner.

3. Complete coordination/shop drawings shall be required in accordance with Article, SUBMITTALS. Construction work shall not start on any system until the coordination/shop drawings have been approved by the Owner/Engineer.

4. Workmanship/craftsmanship will be of the highest quality and standards. The Owner reserves the right to reject any work based on poor quality of workmanship this work shall be removed and done again at no additional cost or time to the Government.

Q. Upon request by the Owner, provide lists of previous installations for selected items of equipment. Include contact persons who will serve as references, with current telephone numbers and e-mail addresses.

1.3 STANDARD AND REGULATORY REQUIREMENTS

A. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. Reference to any code, standard or regulation shall mean the latest published editions, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

C. In the event of conflict between codes, standards or regulations, the conflict

shall be referred to the Engineer for resolution.

D. The organizations having jurisdiction include, but are not limited to, the following:

1. ANSI American National Standards Institute
2. ASME American Society of Mechanical Engineers
3. EPA Federal, State and Local Environmental Protection Agencies
4. IBC International Building Code, New Jersey Edition
5. ISA Instrument Society of America.
6. NEC National Electrical Code.
7. NEMA National Electric Manufacturer's Association.
8. NFPA National Fire Protection Association.
9. OSHA Regulations of the Occupations Safety and Health Administration.
10. UL Underwriter's Laboratories Inc.
11. The state, county or municipal laws and regulations governing the location where the equipment is to be installed.

E. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

A. 'Buy America' Requirements: All manufactured products listed within this specification section are part of a federally assisted procurement involving funds granted by the Federal Transit Administration (FTA) and shall comply with Buy America requirements as delineated by Title 49 Code of Federal Regulations (CFR) Subsection 661.

1.4 SUBMITTALS

A. Refer to Drawing Q9.06 Shop Equipment Schedule for submittal requirements listed in the "Submittals" column of the equipment list. In the event of conflict between Drawing Q9.06 Shop Equipment Schedule and the following expanded submittal descriptions, Drawing Q9.06 Shop Equipment Schedule is to govern.

B. Product Data:

1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.
2. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other

markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

3. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

C. Operation and Maintenance Manual:

1. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

a. Description of system and components.

b. Schematic diagrams of electrical, plumbing and compressed air systems.

c. Manufacturer's printed operating instructions.

d. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

e. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

D. Shop Drawings: Submit in accordance with Division 1 -General Requirements of these specifications. Refer to Drawing Q9.06 Shop Equipment Schedule for the equipment mark numbers requiring shop drawings.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.

E. 'Buy America' Certificates: ‘Buy America' certificates required during bidding shall also be required as part of each product submittal. Certificates shall be

complete and accurate. Certificates shall indicate either compliance or non-compliance with the ‘Buy America' regulations. Certificates of non-compliance shall also include copies of any granted waivers. Waivers still being applied for or being processed at the time of submittal shall be indicated as such.

1.5 PRODUCT SUBSTITUTIONS

A. Follow requirements specified in Division 1 - General Requirements.

B. Additional costs resulting from substitution of products other than those specified, including drawing changes and construction, will be at the expense of the Contractor.

C. Substitution Approval: Manufacturers listed for each equipment item may bid without submittal for that item. Manufacturers not listed shall submit for approval in accordance with "Instructions to Bidders". Prior to installation, submittals for each equipment item by Mark Number shall be provided in accordance with Division 1 - General Requirements.

1.6 WARRANTY

A. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials.

B. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to the Owner.

C. The warranty period shall be the Manufacturer's standard warranty period, but not less than a minimum of twelve (12) months after startup, or 18 months after delivery of the equipment at the site (whichever comes first)..

D. Warranty shall include materials and labor necessary to correct defects.

E. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

F. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

G. All parts shall be readily available locally in the United States.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Piping, duct, equipment, and associated accessories kept on-site should be stored off the ground on skids, ends should be capped or sealed, and these items should be covered with plastic to prevent fouling or contact with excessive moisture. Piping, duct, and equipment should be cleaned of debris inside and out before installation and should be kept clean and protected throughout construction.

B. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Mark Number of this specification.

C. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.8 LABELING

A. Manufacturer shall securely attach in a prominent location on each major item of equipment a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (U.L.), or other National Recognized Testing Laboratory (NRTL), in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. Miratech

2. Steuler

3. Johnson Matthey

4. Peerless Mfg.

2.2 Selective Catalytic Reduction System

A. SCR Reactor Vessel

1. The SCR catalyst reactor housing shall be fabricated from non-scaling heat resistant stainless steel, of rigid reinforced construction. The SCR catalyst reactor housing shall be equipped with ANSI flanges at both ends. The SCR housing and all components in contact with engine exhaust shall be suitable for continuous operation at the maximum engine exhaust temperature without scaling, deformation or any other physical damage for the life of the system.

2. The SCR reactor housing shall be equipped with insulation supports. Insulation shall be supplied and installed by others.

3. The SCR reactor housing shall be designed to be mounted horizontally in the engine exhaust gas duct and be supported from overhead. The SCR supporting steel shall be provided by Supplier.

4. The reactor housing shall be equipped with sample gas ports,

maintenance and inspection doors for easy access and catalyst bed loading and unloading, instrumentation connections and other connections as deemed necessary by the Supplier.

5. The SCR vessel catalyst core shall consist of an adequate number of layers of catalyst material, with room for one (1) additional layer of material in the reactor housing. Each layer of catalyst material shall be of a modular design. Catalyst modules shall be of size and weight to facilitate manual loading.

6. The catalyst shall be type as recommended by the SCR manufacturer and shall be designed for operation at the maximum and minimum exhaust temperatures achievable by the engine.

B. Catalytic System Accessories

1. The SCR system shall include a static exhaust gas mixer to be mounted upstream of the SCR catalyst reactor housing. The mixer shall insure full and complete mixing of the atomized injected reducing agent with the engine exhaust gas under all engine load conditions. The static mixer shall be fabricated from non-scaling heat resistant stainless steel. The static mixer shall be equipped with a stainless steel injection lance, through which the atomized reducing agent is introduced into the exhaust stream. The static mixer shall be equipped with ANSI flanges at both ends.

2. The static mixer shall be equipped with insulation supports. Insulation shall be supplied and installed by others.

3. The SCR system shall be supplied with a reducing agent storage, injection and control system which shall included but not necessarily limited to the follow: Urea storage tank, metering/injection pump, dosing box, atomizing air compressor, and all appurtenances required to form a complete and operable system. The capacity shall by as recommended by the SCR supplier.

4. The reducing agent metering and control system shall be capable of insuring, that the maximum ammonia slip to atmosphere from the SCR system does not exceed the limits specified in Attachment No. 2 under all engine operation conditions. Use of an oxidation catalyst mounted downstream of the SCR catalyst to eliminate excess ammonia slip to atmosphere is prohibited.

5. Compressed air system, for urea atomization shall be provided by the Supplier.

6. The Urea/water solution shall be directed into the exhaust gas stream by means of a metered injection nozzle system.

7. The Supplier shall provide one (1) 6500 gallon, polyethylene storage tank for urea/water solution. The tank shall be installed outdoors and be of vertical design. The Urea tank should be manufactured from High Density Cross linked Polyethylene. It should be one piece seamless

molded designed with wall thicknesses conforming to ASTMD-1998 standards for liquid storage. Must have low temperature impact resistance and U.V. stabilized. Insulation should be at least 2" thick and the heat tracing should be monitored by a separate control panel. The control panel shall operate through the use of dual 115V thermostats. The urea mixture must be maintained above 40 degrees F at all times to avoid the potential for crystallization. Accessories included with the tank:

a. Ultrasonic Level Indication

b. High/Low Level Alarms

c. Integrated Heat Tracing and Insulation for outdoor installation

d. Fill system with vacuum break

C. Piping/Tubing

1. All Urea solution and compressed air pipe/tube materials and components shall be stainless steel. Minimum tube size shall be 1/2 inch nominal. Minimum tubing thickness is 0.063 of an inch.

2. Stainless steel tubing sizes shall be limited to 1" and below. Carbon steel, cast, ductile, or malleable iron piping material shall not be used

3. All stainless steel Urea piping shall be welded. Threaded connections shall be minimized. Pipe threads shall conform to ANSI B2.1, Taper Pipe Threads. Taper threaded connections are unacceptable in stainless steel.

2.3 INSTRUMENTATION AND CONTROLS

A. PLC based, closed loop analysis and reactant injection system to maximize reactant injection efficiency by continuously sampling and analyzing the treated exhaust gas.

B. The SCR control system shall be equipped with an interface display and with a serial interface to permit communication and monitoring of the SCR system from the CUP master control system (MCS). The Supplier shall provide and configure the Modbus communications interface, provide programming of all parameters required to effectively monitor the SCR system from the MCS.

C. Completely pre-wired Control panel, built in accordance to manufacturer standards, with UL listed components, shall be provided.

D. The SCR control system shall be equipped to provide the following functions:

1. Continuous monitoring of the temperature downstream of the SCR (SCR discharge connection)

2. Continuous monitoring of the urea flow rate (gal/hr)

E. The Temperature and Urea flow information shall be continuously stored in

an electronic data storage for the EPA compliance record.

2.4 FINISHES

A. All carbon steel surface and equipment shall be primed and finished painted in accordance with manufacturer's standards. In the absences of specific manufacturer's standards, prime paint with a Zinc rich primer (dry film thickness - 2.0 mils min, 2.5 mils max), finish coat shall be of Aliphatic Polyurethane (dry film thickness - 2.0 mils min, 2.5 mils max) or standard manufacturer epoxy paint.

B. Stainless steel components shall not be painted.

PART 3 - EXECUTION

3.1 INSPECTION

A. Coordinate location of rough-in work and utility stub-outs to assure match with equipment to be installed.

B. Inspect delivered equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all items.

3.2 INSTALLATION

A. Perform work under direct supervision of Foreman or Construction Superintendent with authority to coordinate installation of scheduled equipment with Engineer.

B. Install equipment in accordance with plans, shop drawings and manufacturer's instructions:

1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level, plumb and at right angles to adjacent work.

2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.

3. Anchorage: Attach equipment securely to floor, per manufacturer's instructions and as directed, specified, or detailed by the Structural Engineer for general anchorage and seismic bracing conditions, to prevent damage resulting from inadequate fastening. Installation fasteners shall be installed to avoid scratching or damaging adjacent surfaces.

4. Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.

3.3 TESTING

A. After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with all specified features in the presence of the Engineer using acceptance procedures provided by the manufacturer.

3.4 CLEANUP

A. Touch-up damage to painted finishes.

B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

C. Clean area around equipment installation and remove packing or installation debris from job site.

D. Notify Engineer for acceptance inspection.

3.5 TRAINING

A. Direct the technical representative to provide specified hours of training to designated Owner's maintenance personnel in operation and maintenance of the following equipment. Coordinate, with Owner, training schedule and list of personnel to be trained.

1. VAULT/RECEIVER, FAREBOX, MOBILE BIN
   Equipment Mark Number: 7800
   Hours Required: 1

2. DATA COLLECTION AND REPORTING SYSTEM, FAREBOX
   Equipment Mark Number: 7820
   Hours Required: 1

B. Obtain, from technical representative, a list of Owner's personnel trained in equipment operations and maintenance.

END OF SECTION

SECTION 23 05 19

METERS AND GAGES FOR HVAC PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

B. Equipment and all necessary accessories as designated in this section shall include the following.

1. Bimetallic-actuated thermometers

2. Thermowells.

3. Dial-type pressure gages.

4. Gage attachments.

5. Test plugs.

6. Test plug kit.

1.2 QUALITY ASSURANCE

A. Instruments shall be factory calibrated for the temperature and pressure of the systems in which they are installed.

B. B. Pressure gauges shall be manufactured in accordance with ANSI Specification B-40-1 Grade 2A.

1.3 STANDARD AND REGULATORY REQUIREMENTS

A. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. Reference to any code, standard or regulation shall mean the latest published editions, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

C. In the event of conflict between codes, standards or regulations, the conflict shall be referred to the Engineer for resolution.

D. The organizations having jurisdiction include, but are not limited to, the following:

1. AGA American Gas Association

2. ANSI American National Standards Institute

3. ASME American Society of Mechanical Engineers

4. ASTM American Society for Testing and Materials

5. AWS American Welding Society

6. AWWA American Water Works Association

7. NFPA National Fire Protection Association.

8. OSHA Regulations of the Occupations Safety and Health Administration.

9. UL Underwriter's Laboratories Inc.

10. The state, county or municipal laws and regulations governing the location where the equipment is to be installed.

E. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

A. 'Buy America' Requirements: All manufactured products listed within this specification section are part of a federally assisted procurement involving funds granted by the Federal Transit Administration (FTA) and shall comply with Buy America requirements as delineated by Title 49 Code of Federal Regulations (CFR) Subsection 661.

1.4 SUBMITTALS

A. Manufacturers Installation Instructions: Submit installation instructions for material and equipment.

B. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

D. Shop Drawings - Submit in accordance with Division 1 -General Requirements of these specifications.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include operational clearances, mounting requirements, and structural supports required for the submitted equipment.

a. Wiring Diagrams: For power, signal, and control wiring.

2. Product Data: For each type of product indicated.

3. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

4. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

5. Project Record Documents: Record actual locations of components and instrumentation.

E. Operation and Maintenance Manual:

1. Provide operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

a. Manufacturer's printed operating instructions.

b. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

c. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

F. 'Buy America' Certificates: ‘Buy America' certificates required during bidding shall also be required as part of each product submittal. Certificates shall be complete and accurate. Certificates shall indicate either compliance or non-compliance with the ‘Buy America' regulations. Certificates of non-compliance shall also include copies of any granted waivers. Waivers still being applied for or being processed at the time of submittal shall be indicated as such.

1.5 WARRANTY

A. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials.

B. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to

the Owner.

C. The warranty period shall be the Manufacturer's standard warranty period, but not less than a minimum of twelve (12) months after startup, or 18 months after delivery of the equipment at the site (whichever comes first).

D. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

E. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. Bimetallic-actuated thermometers

a. Ashcroft Inc.

b. Trerice, H. O. Co., EI Series

c. Weiss Instruments, Inc.

2. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

a. AMETEK, Inc.; U.S. Gauge.

b. Ashcroft Inc.

c. Trerice, H. O. Co.

d. Weiss Instruments, Inc.

3. Test Plugs:

a. Flow Design, Inc.

b. Peterson Equipment Co., Inc.

c. Trerice, H. O. Co.

d. Weiss Instruments, Inc.

2.2 BIMETALLIC-ACTUATED THERMOMETERS

A. Standard: ASME B40.200.

B. Case: Sealed types; stainless steel with 3-inch nominal diameter.

C. External adjustment.

D. Dial: Nonreflective aluminum with permanently etched scale markings and scales in deg F.

E. Connector Type(s): Union joint, adjustable angle, with unified-inch screw threads.

F. Connector Size: 1/2 inch, with ASME B1.1 screw threads.

G. Stem: 0.25 or 0.375 inch in diameter; stainless steel.

H. Window: Plain glass or plastic.

I. Ring: Stainless steel.

J. Element: Bimetal coil.

K. Pointer: Dark-colored metal.

L. Accuracy: Plus or minus 1 percent of scale range.

2.3 THERMOWELLS

A. Thermowells:

1. Standard: ASME B40.200.

2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.

3. Material for Use with Copper Tubing: CNR or CUNI.

4. Material for Use with Steel Piping: CRES.

5. Type: Stepped shank unless straight or tapered shank is indicated.

6. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.

7. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.

8. Bore: Diameter required to match thermometer bulb or stem.

9. Insertion Length: Length required to match thermometer bulb or stem.

10. Lagging Extension: Include on thermowells for insulated piping and tubing.

11. Bushings: For converting size of thermowell's internal screw thread to

size of thermometer connection.

B. Heat-Transfer Medium: Mixture of graphite and glycerin

2.4 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Standard: ASME B40.100.

2. Case: Liquid-filled type(s); cast aluminum or drawn steel; 4-1/2-inch nominal diameter.

3. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.

4. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.

5. Movement: Mechanical, with link to pressure element and connection to pointer.

6. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi.

7. Pointer: Dark-colored metal.

8. Window: Glass or plastic.

9. Ring: Metal.

10. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

2.5 GAGE ATTACHMENTS

A. Snubbers: ASME B40.100, brass; with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and piston-type surge-dampening device. Include extension for use on insulated piping.

B. Siphons: Loop-shaped section of brass pipe with NPS 1/4 or NPS 1/2 pipe threads.

C. Valves: Brass ball, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads.

2.6 TEST PLUGS

A. Description: Test-station fitting made for insertion into piping tee fitting.

B. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.

C. Thread Size: NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe thread.

D. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.

E. Core Inserts: Chlorosulfonated polyethylene synthetic and EPDM self-sealing rubber

2.7 TEST PLUG KIT

A. Furnish one test-plug kit containing two thermometer(s), one pressure gage and adapter, and carrying case. Thermometer sensing elements, pressure gage, and adapter probes shall be of diameter to fit test plugs and of length to project into piping.

B. Low-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch-diameter dial and tapered-end sensing element. Dial range shall be at least 25 to 125 deg F.

C. High-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch-diameter dial and tapered-end sensing element. Dial range shall be at least 0 to 220 deg F.

D. Pressure Gage: Small, Bourdon-tube insertion type with 2- to 3-inch- diameter dial and probe. Dial range shall be at least 0 to 200 psig.

E. Carrying Case: Metal or plastic, with formed instrument padding.

PART 3 - EXECUTION

3.1 FIELD CONDITIONS

A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install thermowells with socket to center of pipe and in vertical position in piping tees.

C. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.

D. Install thermowells with extension on insulated piping.

E. Fill thermowells with heat-transfer medium.

F. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.

G. Pack thermometers in a thermal conductive compound. Preferred products are: Honeywell Part No. 107408; Jonson Controls F-1000-182; York 013-00898-000.

H. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.

I. Install valve and snubber in piping for each pressure gage for fluids (except steam).

J. Install valve and syphon fitting in piping for each pressure gage for steam.

K. Install test plugs in piping tees.

L. Assemble and install connections, tubing, and accessories between flow- measuring elements and flowmeters according to manufacturer's written instructions.

M. Install flowmeter elements in accessible positions in piping systems, and per manufacturer's requirements.

N. Install wafer-orifice flowmeter elements between pipe flanges.

O. Install differential-pressure-type flowmeter elements, with at least minimum straight lengths of pipe, upstream and downstream from element according to manufacturer's written instructions.

P. Install permanent indicators on walls or brackets in accessible and readable positions.

Q. Install connection fittings in accessible locations for attachment to portable indicators.

R. Install thermometers in the following locations:

1. Inlet and outlet of each hydronic zone.

2. Inlet and outlet of each hydronic boiler.

3. Two inlets and two outlets of each hydronic heat exchanger.

4. Inlet and outlet of each thermal-storage tank.

S. Install pressure gages in the following locations:

1. Discharge of each pressure-reducing valve.

2. Inlet and outlet of each heat exchanger-water connection.

3. Suction and discharge of each pump.

3.3 CONNECTIONS

A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

B. Connect flowmeter-system elements to meters.

C. Connect flowmeter transmitters to meters.

D. Connect thermal-energy meter transmitters to meters.

3.4 ADJUSTING

A. After installation, calibrate meters according to manufacturer's written instructions.

B. Adjust faces of meters and gages to proper angle for best visibility.

3.5 THERMOMETER SCALE-RANGE SCHEDULE

A. Scale Range for Heating and Glycol, Hot-Water Piping: 30 to 250 deg F or 30 to 300 deg F.

3.6 PRESSURE-GAGE SCALE-RANGE SCHEDULE

A. Scale Range for Hydronic Water Piping: As best suited for final project conditions.

3.7 FLOWMETER SCHEDULE

A. Flowmeters for Hydronic Piping: Electromagnetic type.

END OF SECTION

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SECTION 23 05 23

GENERAL DUTY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

B. Equipment and all necessary accessories as designated in this section shall include the following.

1. Bronze ball valves.

2. Iron, butterfly valves.

3. High-performance butterfly valves.

4. Bronze lift check valves.

5. Bronze swing check valves.

6. Iron swing check valves.

7. Iron, grooved-end swing-check valves.

8. Bronze gate valves.

9. Iron gate valves.

10. Bronze globe valves.

11. Iron globe valves.

1.2 QUALITY ASSURANCE

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:

1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

2. ASME B31.1 for power piping valves.

3. ASME B31.9 for building services piping valves.

1.3 STANDARD AND REGULATORY REQUIREMENTS

A. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. Reference to any code, standard or regulation shall mean the latest published editions, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

C. In the event of conflict between codes, standards or regulations, the conflict shall be referred to the Engineer for resolution.

D. The organizations having jurisdiction include, but are not limited to, the following:

1. ANSI American National Standards Institute

2. ASME American Society of Mechanical Engineers

3. ASTM American Society for Testing and Materials

4. AWS American Welding Society

5. AWWA American Water Works Association

6. MSS Manufacturers Standardization Society of the Valve and Fittings Industry

7. NFPA National Fire Protection Association.

8. OSHA Regulations of the Occupations Safety and Health Administration.

9. UL Underwriter's Laboratories Inc.

10. The state, county or municipal laws and regulations governing the location where the equipment is to be installed.

E. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

A. ‘Buy America' Requirements: All manufactured products listed within this specification section are part of a federally assisted procurement involving funds granted by the Federal Transit Administration (FTA) and shall comply with Buy America requirements as delineated by Title 49 Code of Federal Regulations (CFR) Subsection 661.

1.4 SUBMITTALS

A. Design Data: Indicate pipe size. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Submit data on all materials, fittings, accessories and equipment.

B. Manufacturers Installation Instructions: Submit installation instructions for material and equipment.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

E. Shop Drawings - Submit in accordance with Division 1 -General Requirements of these specifications.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.

2. Provide product data for each type of the following:

a. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.

3. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

4. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

F. Operation and Maintenance Manual:

1. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

a. Description of system and components.

b. Manufacturer's printed operating instructions.

c. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

d. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

G. 'Buy America' Certificates: ‘Buy America' certificates required during bidding shall also be required as part of each product submittal. Certificates shall be complete and accurate. Certificates shall indicate either compliance or non-compliance with the ‘Buy America' regulations. Certificates of non-compliance shall also include copies of any granted waivers. Waivers still being applied for or being processed at the time of submittal shall be indicated as such.

1.5 WARRANTY

A. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials.

B. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to the Owner.

C. The warranty period shall be the Manufacturer's standard warranty period, but not less than a minimum of twelve (12) months after startup, or 18 months after delivery of the equipment at the site (whichever comes first).

D. Warranty shall include materials and labor necessary to correct defects.

E. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

F. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.

2. Protect threads, flange faces, grooves, and weld ends.

3. Set ball valves open to minimize exposure of functional surfaces.

4. Set butterfly valves closed or slightly open.

5. Block check valves in either closed or open position.

B. Use the following precautions during storage:

1. Maintain valve end protection.

2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. Bronze Ball Valves, Three-Piece with Full Port Stainless-Steel Trim

a. Conbraco Industries, Inc.; Apollo Valves.

b. Neles-Jamesbury, Inc.

c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Butterfly Valves

a. Bray Controls; a division of Bray International.

b. Crane Co.; Crane Valve Group; Stockham Division.

c. DeZurik Water Controls.

d. Hammond Valve.

e. Milwaukee Valve Company

3. High-Performance Butterfly Valves

a. Bray Controls; a division of Bray International.

b. Crane Co.; Crane Valve Group; Flowseal.

c. Crane Co.; Crane Valve Group; Stockham Division.

d. DeZurik Water Controls.

e. Milwaukee Valve Company

f. Jamesbury, Inc

4. Bronze Lift Check Valves

a. Nibco

b. Crane Co.; Crane Valve Group; Crane Valves.

c. Mueller.

5. Bronze Horizontal Swing Check Valves

a. Nibco

b. Crane Co.; Crane Valve Group; Crane Valves.

c. Mueller

6. Iron Swing Check Valves

a. Nibco

b. Crane Co.; Crane Valve Group; Crane Valves.

c. Mueller

7. Iron Grooved End Swing Check Valves

a. Nibco

b. Crane Co.; Crane Valve Group; Crane Valves.

c. Mueller

8. Bronze Gate Valves

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Crane Co.; Crane Valve Group; Stockham Division.

c. Hammond Valve.

d. Milwaukee Valve Company.

e. NIBCO INC.

f. Conbraco Industries, Inc.; Apollo Valves.

9. Iron Gate Valves

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Crane Co.; Crane Valve Group; Stockham Division.

c. Hammond Valve.

d. Milwaukee Valve Company.

e. NIBCO INC.

f. Conbraco Industries, Inc.; Apollo Valves.

10. Bronze Globe Valves

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Crane Co.; Crane Valve Group; Stockham Division.

c. Hammond Valve.

d. Milwaukee Valve Company.

e. NIBCO INC.

f. Conbraco Industries, Inc.; Apollo Valves.

11. Iron Globe Valves

a. Crane Co.; Crane Valve Group; Crane Valves.

b. Crane Co.; Crane Valve Group; Stockham Division.

c. Hammond Valve.

d. Milwaukee Valve Company.

e. NIBCO INC.

f. Conbraco Industries, Inc.; Apollo Valves.

2.2 GENERAL REQUIREMENTS FOR VALVES

A. Refer to HVAC valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valve Sizes: Same as upstream piping unless otherwise indicated.

D. Valve Actuator Types:

1. Gear Actuator: For quarter-turn valves NPS 8 and larger.
2. Handwheel: For valves other than quarter-turn types.
3. Hand lever: For quarter-turn valves NPS 6 and smaller.

E. Valves in Insulated Piping: With 2-inch stem extensions and the following features:

1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without

breaking the vapor seal or disturbing insulation.

2. Butterfly Valves: With extended neck.

3. Gate Valves: With rising stem.

F. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves.

2. Grooved: With grooves according to AWWA C606.

3. Solder Joint: With sockets according to ASME B16.18.

4. Threaded: With threads according to ASME B1.20.1.

G. Valve Bypass and Drain Connections: MSS SP-45

2.3 BRONZE BALL VALVES

A. Bronze Ball Valves, Three-Piece with Full Port Stainless-Steel Trim:

1. Description:

a. Standard: MSS SP-110.

b. SWP Rating: 150 psig (1035 kPa).

c. CWP Rating: 600 psig (4140 kPa).

d. Body Design: Three piece.

e. Body Material: Bronze.

f. Ends: Threaded.

g. Seats: PTFE.

h. Stem: 316L Stainless steel.

i. Ball: 316L Stainless steel, vented.

j. Port: Full.

2.4 IRON, BUTTERFLY VALVES

A. Class 150B, Iron, Mechanical Joint or Flanged End Butterfly Valves:

1. Description:

a. Standard: ANSI Class 150B tested to 200 psi.

b. Body Material: Coated, cast iron.

c. Mechanical Joint or Flanged end.

d. Stem: Two-piece stainless steel.

e. Disc: Coated, ductile iron.

f. Seal: EPDM.

g. Shaft: 304 stainless steel.

2.5 HIGH-PERFORMANCE BUTTERFLY VALVES

A. Class 150, Single-Flange, High-Performance Butterfly Valves:

1. Description:

a. Standard: ANSI Class 150 lugged design.

b. CWP Rating: 275 psig at 100 deg F.

c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange, double offset design.

d. Body Material: Carbon steel, or stainless steel.

e. Seat: Reinforced PTFE or metal.

f. Stem: Stainless steel; offset from seat plane, one piece stem.

g. Disc: Carbon steel.

h. Service: Bidirectional.

i. Packing: PTFE V-ring.

2.6 BRONZE LIFT CHECK VALVES

A. Class 150, Lift Check Valves with Bronze Disc:

1. Description:

a. Standard: MSS SP-80, Type 1.

b. CWP Rating: 250 psig (1380 kPa) wog.

c. Body Design: Vertical flow.

d. Body Material: ASTM B 61 or ASTM B 584, bronze.

e. Ends: Threaded.

f. Disc: Bronze.

2.7 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Horizontal Swing Check Valves with Bronze Disc:

1. Description:

a. Standard: MSS SP-80, Type 3.

b. CWP Rating: 200 psig.

c. Body Design: Horizontal flow.

d. Body Material: ASTM B 62, bronze.

e. Ends: Threaded.

f. Disc: Bronze.

B. Class 150, Bronze Swing Check Valves with Bronze Disc:

1. Description:

a. Standard: MSS SP-80, Type 3.

b. CWP Rating: 300 psig.

c. Body Design: Horizontal flow.

d. Body Material: ASTM B 62, bronze.

e. Ends: Threaded.

f. Disc: Bronze.

2.8 IRON SWING CHECK VALVES

A. Class 125, Iron Swing Check Valves with Metal Seats:

1. Description:

a. Standard: MSS SP-71, Type I.

b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.

c. NPS 14 to NPS 24, CWP Rating: 150 psig.

d. Body Design: Clear or full waterway.

e. Body Material: ASTM A 126, gray iron with bolted bonnet.

f. Ends: Flanged.

g. Trim: Bronze.

h. Gasket: Asbestos free.

B. Class 250, Iron Swing Check Valves with Metal Seats:

1. Description:

a. Standard: MSS SP-71, Type I.

b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.

c. NPS 14 to NPS 24, CWP Rating: 300 psig.

d. Body Design: Clear or full waterway.

e. Body Material: ASTM A 126, gray iron with bolted bonnet.

f. Ends: Flanged.

g. Trim: Bronze.

h. Gasket: Asbestos free.

2.9 IRON, GROOVED-END SWING CHECK VALVES

A. 300 CWP, Iron, Grooved-End Swing Check Valves:

1. Description:

a. CWP Rating: 300 psig.

b. Body Material: ASTM A 536, ductile iron.

c. Seal: EPDM.

d. Disc: Spring operated, ductile iron or stainless steel.

2.10 BRONZE GATE VALVES

A. Class 125, RS Bronze Gate Valves:

1. Description:

a. Standard: MSS SP-80, Type 2.

b. CWP Rating: 200 psig (1380 kPa).

c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.

d. Ends: Threaded or solder joint.

e. Stem: Bronze.

f. Disc: Solid wedge; bronze.

g. Packing: Asbestos free.

h. Handwheel: Malleable iron.

B. Class 150, RS Bronze Gate Valves:

1. Description:

a. Standard: MSS SP-80, Type 2.

b. CWP Rating: 300 psig (2070 kPa).

c. Body Material: ASTM B 62, bronze with integral seat and union-ring bonnet.

d. Ends: Threaded.

e. Stem: Bronze.

f. Disc: Solid wedge; bronze.

g. Packing: Asbestos free.

h. Handwheel: Malleable iron

2.11 IRON GATE VALVES

A. Class 125, OS&Y, Iron Gate Valves:

1. Description:

a. Standard: MSS SP-70, Type I.

b. NPS 2-1/2 to NPS 12, CWP Rating: 200 psig.

c. NPS 14 to NPS 24, CWP Rating: 150 psig.

d. Body Material: ASTM A 126, gray iron with bolted bonnet.

e. Ends: Flanged.

f. Trim: Bronze.

g. Disc: Solid wedge.

h. Packing and Gasket: Asbestos free.

B. Class 250, OS&Y, Iron Gate Valves:

1. Description

a. Standard: MSS SP-70, Type I.

b. NPS 2-1/2 to NPS 12, CWP Rating: 500 psig.

c. NPS 14 to NPS 24, CWP Rating: 300 psig.

d. Body Material: ASTM A 126, gray iron with bolted bonnet.

e. Ends: Flanged.

f. Trim: Bronze.

g. Disc: Solid wedge.

h. Packing and Gasket: Asbestos free.

2.12 BRONZE GLOBE VALVES

A. Class 125, Bronze Globe Valves with Bronze Disc:

1. Description

a. Standard: MSS SP-80, Type 1.

b. CWP Rating: 200 psig.

c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.

d. Ends: Threaded or solder joint.

e. Stem and Disc: Bronze.

f. Packing: Asbestos free.

g. Handwheel: Malleable iron.

2.13 IRON GLOBE VALVES

A. Class 125, Iron Globe Valves:

1. Description:

a. Standard: MSS SP-85, Type I.

b. CWP Rating: 200 psig.

c. Body Material: ASTM A 126, gray iron with bolted bonnet.

d. Ends: Flanged.

e. Trim: Bronze.

f. Packing and Gasket: Asbestos free.

B. Class 250, Iron Globe Valves:

1. Description:

a. Standard: MSS SP-85, Type I.

b. CWP Rating: 500 psig.

c. Body Material: ASTM A 126, gray iron with bolted bonnet.

d. Ends: Flanged.

e. Trim: Bronze.

f. Packing and Gasket: Asbestos

free PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

3.2 INSTALLATION

A. General: Comply with the ICC IMC, ICC IPC.

1. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

2. Locate valves for easy access and provide separate support where necessary.

3. Install valves in horizontal piping with stem at or above center of pipe.

4. Install valves in position to allow full stem movement.

5. Install chainwheels on operators for butterfly valves NPS 4 and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor.

6. Install check valves for proper direction of flow and as follows:

   a. Swing Check Valves: In horizontal position with hinge pin level.

   b. Lift Check Valves: With stem upright and plumb.

B. If valve applications are not indicated, use the following:

1. Shutoff Service:

   a. NPS 2 and Smaller: Ball

   b. NPS 2-1/2 and Larger: Butterfly

2. Dead-End Service: Single-flange (lug) type butterfly valves.

3. Throttling Service except Steam: Ball whenever allowable by size, and globe or butterfly if larger required.

4. Pump-Discharge Check Valves:

   a. NPS 2 and Smaller: Bronze swing check valves with bronze disc.

   b. NPS 2-1/2 and Larger: Iron swing check valves with lever and weight or with spring or iron, center-guided, metal or resilient-seat check valves.

C. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

D. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solderjoint valve-end option is indicated in valve schedules below.

2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.

3. For Copper Tubing, NPS 5 and Larger: Flanged ends.

4. For Steel Piping, NPS 2 and Smaller: Threaded ends.

5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.

6. For Steel Piping, NPS 5 and Larger: Flanged ends.

7. For Grooved-End Copper Tubing and Steel Piping except Steam and Steam Condensate Piping: Valve ends may be grooved.

3.3 LOW TEMPERATURE COLD WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.

2. Ball Valves: Two piece, full port, bronze with stainless-steel trim.

3. Bronze Swing Check Valves: Class 150, bronze disc.

B. Pipe NPS 2-1/2 and Larger:

1. Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: 175 CWP.

2. High-Performance Butterfly Valves: Class 300, single flange.

3. Iron Swing Check Valves: Class 250, metal seats.

4. Iron, Grooved-End Check Valves, NPS 3 to NPS 12: 300 CWP.

3.4 LOW TEMPERATURE HOT WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.

2. Ball Valves: Two piece, full port, bronze with stainless-steel trim.

3. Bronze Swing Check Valves: Class 150, bronze disc.

B. Pipe NPS 2-1/2 and Larger:

1. Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: 175 CWP.

2. High-Performance Butterfly Valves: Class 300, single flange.

3. Iron Swing Check Valves: Class 250, metal seats.

4. Iron, Grooved-End Check Valves, NPS 3 to NPS 12: 300 CWP.

3.5 VALVE INSTALLATION

A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, aluminum, or copper connector.

B. Install underground valves with valve boxes.

C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.

D. Install earthquake valves aboveground outside buildings according to listing.

E. Install anode for metallic valves in underground PE piping.

3.6 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

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SECTION 23 05 29

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

B. Equipment and all necessary accessories as designated in this section shall include the following.

1. Metal pipe hangers and supports.

2. Trapeze pipe hangers.

3. Metal framing systems.

4. Thermal-hanger shield inserts.

5. Fastener systems.

6. Pipe stands.

7. Equipment supports.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.3 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

C. Hangers and Supports for mechanical and plumbing piping shall be in accordance with MSS Standards.

1. MSS SP-58 – Pipe Hangers and Supports – Materials, Design and Manufacturer

2. MSS SP-69 – Pipe Hangers and Supports – Selection and Application

3. MSS SP-89 – Pipe Hangers and Supports – Fabrication and Installation Practices

D. Hangers and Supports for fire protection piping shall be in accordance with NFPA Standards.

E. Provide products which are UL listed and FM approved.

1. NFPA 13 – Standard for the Installation of Sprinkler Systems.

1.4 STANDARD AND REGULATORY REQUIREMENTS

A. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. Reference to any code, standard or regulation shall mean the latest published editions, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

C. In the event of conflict between codes, standards or regulations, the conflict shall be referred to the Engineer for resolution.

D. The organizations having jurisdiction include, but are not limited to, the following:

1. ANSI American National Standards Institute

2. ASME American Society of Mechanical Engineers

3. ASTM American Society for Testing and Materials

4. AWS American Welding Society

5. AWWA American Water Works Association

6. MSS Manufacturers Standardization Society of the Valve and Fittings Industry

7. NFPA National Fire Protection Association.

8. OSHA Regulations of the Occupations Safety and Health Administration.

9. UL Underwriter's Laboratories Inc.

10. The state, county or municipal laws and regulations governing the location where the equipment is to be installed.

E. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

A. 'Buy America' Requirements: All manufactured products listed within this specification section are part of a federally assisted procurement involving funds granted by the Federal Transit Administration (FTA) and shall comply with Buy America requirements as delineated by Title 49 Code of Federal Regulations (CFR) Subsection 661.

1.5 SUBMITTALS

A. Design Data: Indicate pipe size. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Submit data on all materials, accessories and equipment.

B. Manufacturers Installation Instructions: Submit installation instructions for material and equipment.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

E. Shop Drawings - Submit in accordance with Division 1 -General Requirements of these specifications.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, mounting requirements, and structural supports required for the submitted equipment.

2. Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:

a. Trapeze pipe hangers.

b. Metal framing systems.

c. Pipe stands.

d. Equipment supports.

3. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

4. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

F. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of trapeze hangers.

2. Design Calculations: Calculate requirements for designing trapeze hangers.

G. Operation and Maintenance Manual:

1. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

a. Description of system and components.

b. Manufacturer's printed operating instructions.

c. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

d. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

H. 'Buy America' Certificates: ‘Buy America' certificates required during bidding shall also be required as part of each product submittal. Certificates shall be

complete and accurate. Certificates shall indicate either compliance or non-compliance with the 'Buy America' regulations. Certificates of non-compliance shall also include
copies of any granted waivers. Waivers still being applied for or being processed at the time of submittal shall be indicated as such.

1.6 WARRANTY

A. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials.

B. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to the Owner.

C. The warranty period shall be the Manufacturer's standard warranty period, but not less than a minimum of twelve (12) months after startup, or 18 months after delivery of the equipment at the site (whichever comes first).

D. Warranty shall include materials and labor necessary to correct defects.

E. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

F. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. Supports, General

a. Anvil

b. Cooper B-Line, Inc.

c. Atkore Power-Strut.

d. Superstrut

e. Atkore Unistrut Corporation.

2. Metal Framing Systems

a. Allied Tube & Conduit.

b. Cooper B-Line, Inc.

c. Atkore Power-Strut.

d. Atkore Unistrut Corporation.

3. Thermal Hanger Shields Inserts

a. Carpenter & Paterson, Inc.

b. Clement Support Services.

c. National Pipe Hanger Corporation.

d. PHS Industries, Inc.

e. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.

f. Piping Technology & Products, Inc.

g. Rilco Manufacturing Co., Inc.

2.2 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components, coated.

2. Galvanized Metallic Coating: Hot dip galvanized.

3. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel with either electro-plated zinc or hot dipped galvanized finish.

B. Copper Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper, factory-fabricated components.

2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper- coated steel.

C. Stainless Steel Pipe Hangers:

1. Description: MSS SP-58, Types 1 through 58, stainless steel, factory- fabricated components.

2. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop or field-fabricated pipe-support assembly made from structural hot-dip galvanized, carbon-steel shapes with MSS SP-58 hot- dip galvanized or electro-coated zinc, carbon-steel hanger rods, nuts, saddles, and U-bolts. If used, they cannot impede serviceability of equipment.

B. See delegated design requirements in 1.4 above.

2.4 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.

2. Standard: MFMA-4.

3. Channels: Continuous slotted steel channel with in-turned lips.

4. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.

5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

6. Metallic Coating: Hot dip galvanized or electroplated zinc.

2.5 THERMAL-HANGER SHIELD INSERTS

A. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength and vapor barrier.

B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig ASTM C 552, Type II cellular glass with 100- psig minimum compressive strength.

C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.6 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for

use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.7 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.

B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.

C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.

D. High-Type, Single-Pipe Stand:

1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.

2. Base: Stainless steel.

3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous thread rods.

4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless steel, roller-type pipe support.

E. High-Type, Multiple-Pipe Stand:

1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.

2. Bases: One or more; plastic.

3. Vertical Members: Two or more protective-coated-steel channels.

4. Horizontal Member: Protective-coated-steel channel.

5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.

F. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.8 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon steel shapes, with hot dip galvanized coating.

2.9 MISCELLANEOUS MATERIALS AND REQUIREMENTS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and hot dip galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non- shrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Non-staining, noncorrosive, and nongaseous.

2. Design Mix: 5000-psi, 28-day compressive strength.

a. Hangers are required to be specific to pipe and ductwork independently and not shared.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers. Multiple, stacked trapezes are not allowed.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

E. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

F. Pipe Stand Installation:

1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.

2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb.

G. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

H. Supports and hangers shall not interfere with equipment access.

I. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

J. Install hangers and supports to allow controlled thermal movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

K. Install lateral bracing with pipe hangers and supports to prevent swaying.

L. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, strainers, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

M. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

N. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

O. Insulated Piping:

1. Attach clamps and spacers to piping.

a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.

b. Piping Operating below Ambient Air Temperature: Use thermal- hanger shield insert with clamp sized to match OD of insert.

c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.

2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches

adjoining insulation.

a. Option: Thermal-hanger shield inserts may be used. Include steel weight- distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.

a. Option: Thermal-hanger shield inserts may be used. Include steel weight- distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.

4. Shield Dimensions for Pipe: Not less than the following:

a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.

b. NPS 4: 12 inches long and 0.06 inch thick.

c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.

d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.

5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate- insulation inserts of length at least as long as protective shield.

6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

7. Un-insulated Piping:

a. Where insulation is not required, use similar metal hangers such as copper hangers for copper piping, stainless steel for stainless steel piping, etc.

3.2 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

5. Re-galvanize if galvanizing affected.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 099100 "Painting"."

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use coated carbon-steel pipe hangers and supports, metal trapeze pipe hangers and metal framing systems and attachments for general service

applications.

E. Use copper pipe hangers and copper attachments for copper piping and tubing. Likewise for stainless steel piping and tubing, use stainless steel hangers.

F. Use padded hangers for piping that is subject to scratching.

G. Use thermal-hanger shield inserts for insulated piping and tubing.

H. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non- insulated or insulated, stationary pipes NPS 1/2 to NPS 30.

2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.

3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.

4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.

5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.

6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of non-insulated, stationary pipes NPS 3/4 to NPS.

7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of non- insulated, stationary pipes NPS 1/2 to NPS 8.

8. Adjustable Band Hangers (MSS Type 9): For suspension of non-insulated, stationary pipes NPS 1/2 to NPS 8.

9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of non-insulated, stationary pipes NPS 1/2 to NPS 8.

10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of non-insulated, stationary pipes NPS 3/8 to NPS 8.

11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of non-insulated, stationary pipes NPS 3/8 to NPS 3.

12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.

13. Clips (MSS Type 26): For support of insulated pipes not subject

to expansion or contraction.

14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.

15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.

16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.

17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.

18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2- 1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.

19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.

21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

I. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.

2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.

J. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.

2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.

3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.

4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.

5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

K. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.

2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.

3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.

4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.

5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.

6. C-Clamps (MSS Type 23): For structural shapes.

7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.

8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.

9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.

10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.

11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.

12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb.

    b. Medium (MSS Type 32): 1500 lb.

    c. Heavy (MSS Type 33): 3000 lb.

13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.

14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

L. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.

2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.

3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

M. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.

2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.

3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.

4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.

5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.

6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.

7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.

8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:

a. Horizontal (MSS Type 54): Mounted horizontally.

b. Vertical (MSS Type 55): Mounted vertically.

c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.

N. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

O. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

P. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

3.7 HANGER SUPPORT INSTALLATION

A. Hanger Spacing: Provide hangers at minimum spacing in accordance with Chapter 41, ASHRAE Guide and as follows:

1. Steel Pipe, Copper Tubing: For straight runs of horizontal piping with no concentrated loads such as valves, flanges, expansion joints, or other components. Sections of piping with concentrated loads will have to be considered carefully and a determination made as to appropriate spacing and rod size for the given situation.

Pipe Size	Max. Span Steel	Max. Span Copper	Rod Size
1" and smaller	7 feet	5 feet	3/8"
1-1/4" to 2"	8 feet	8 feet	3/8"
2-1/2" to 3"	11 feet	9 feet	1/2"
4" to 5"	14 feet	10 feet	1/2"
6"	17 feet	12 feet	5/8"
8"	19 feet	14 feet	7/8"
10"	20 feet	N/A	7/8"
12"	20 feet	N/A	7/8"
14"	20 feet	N/A	1"
16"	20 feet	N/A	1"
18"	20 feet	N/A	1 1/4"

20"	20 feet	N/A	1 1/4"
24"	20 feet	N/A	1 1/2"

B. Install seismic restraints on piping as required.

END OF SECTION

SECTION 23 11 23

FACILITY NATURAL GAS PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

B. Fuel gas systems, including piping, equipment and all necessary accessories as designated in this section shall include the following.

1. Natural gas piping buried.

2. Natural gas piping above grade.

3. Unions and flanges.

4. Strainers.

5. Natural gas pressure regulators.

6. Natural gas pressure relief valves.

7. Underground pipe markers.

8. Bedding and cover materials.

1.2 QUALITY ASSURANCE

A. Manufacturer's Representative:

1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out and start up.

B. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

D. Pipe Fusion Qualifications: Qualify procedures according to ASTM

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.3 STANDARD AND REGULATORY REQUIREMENTS

A. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. Reference to any code, standard or regulation shall mean the latest published editions, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

C. In the event of conflict between codes, standards or regulations, the conflict shall be referred to the Engineer for resolution.

D. The organizations having jurisdiction include, but are not limited to, the following:

1. AGA American Gas Association

2. ANSI American National Standards Institute

3. ASME American Society of Mechanical Engineers

4. ASTM American Society for Testing and Materials

5. AWS American Welding Society

6. AWWA American Water Works Association

7. MSS Manufacturers Standardization Society of the Valve and Fittings Industry

8. NFPA National Fire Protection Association.

9. OSHA Regulations of the Occupations Safety and Health Administration.

10. UL Underwriter's Laboratories Inc.

11. The state, county or municipal laws and regulations governing the location where the equipment is to be installed.

E. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

A. ‘Buy America' Requirements: All manufactured products listed within this specification section are part of a federally assisted procurement involving funds granted by the Federal Transit Administration (FTA) and shall comply with Buy America requirements as delineated by Title 49 Code of Federal Regulations (CFR) Subsection 661.

1.4 SYSTEM DESCRIPTION

A. Where more than one piping system material is specified, provide

compatible system components and joints.

B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded connections to valves, equipment.

C. Provide pipe hangers and supports in accordance with other sections.

D. Use plug, ball, or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.

1.5 SUBMITTALS

A. Design Data: Indicate pipe size. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Submit data on all materials, fittings, accessories and equipment.

B. Manufacturers Installation Instructions: Submit installation instructions for material and equipment.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

E. Shop Drawings - Submit in accordance with Division 1 -General Requirements of these specifications.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.

2. Provide product data for each type of the following:

a. Piping.

b. Fittings.

c. Joints.

d. Piping specialties.

e. Corrugated, stainless-steel tubing with associated components.

f. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.

g. Pressure regulators. Indicate pressure ratings and capacities.

h. Service meters including supports.

i. Mechanical sleeve seals.

j. Escutcheons.

k. Supports.

l. Remote meter reading accessories.

m. Seismic gas shut off valves.

3. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

4. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

F. Seismic-Design Submittal: Provide for natural-gas piping and equipment indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of seismic restraints.

2. Design Calculations: Calculate requirements for selecting seismic restraints.

G. Operation and Maintenance Manual:

1. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

a. Description of system and components.

b. Manufacturer's printed operating instructions.

c. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

d. List of original manufacturer's parts, including suppliers' part

numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

H. 'Buy America' Certificates: ‘Buy America' certificates required during bidding shall also be required as part of each product submittal. Certificates shall be complete and accurate. Certificates shall indicate either compliance or non-compliance with the ‘Buy America' regulations. Certificates of non-compliance shall also include copies of any granted waivers. Waivers still being applied for or being processed at the time of submittal shall be indicated as such.

1.6 WARRANTY

A. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials.

B. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to the Owner.

C. The warranty period shall be the Manufacturer's standard warranty period, but not less than a minimum of twelve (12) months after startup, or 18 months after delivery of the equipment at the site (whichever comes first).

D. Warranty shall include materials and labor necessary to correct defects.

E. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

F. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Handling Flammable Liquids: Remove and dispose of liquids from existing natural- gas piping according to requirements of authorities having jurisdiction.

B. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

C. Store and handle pipes and tubes having factory-applied protective coatings to avoid damaging coating and protect from direct sunlight.

D. Protect stored PE pipes and valves from direct sunlight.

1.8 LABELING

A. Manufacturer shall securely attach in a prominent location on each major item of equipment a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (U.L.), or other National Recognized Testing Laboratory (NRTL), in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. Strainers

a. Mueller Steam Specialty.

b. O.C. Keckley Company.

c. Spirax Sarco, Inc.

2. Natural Gas Pressure Regulators

a. Emerson Fisher.

b. Sensus Equimeter.

c. American Meter.

d. Maxitrol.

3. Natural Gas Relief Valves

a. Emerson Fisher.

b. American Meter.

c. Or Approved Equal

4. Dielectric Unions

a. Capitol Manufacturing Company.

b. Central Plastics Company.

c. Hart Industries International, Inc.

d. McDonald, A. Y. Mfg. Co.

e. Watts Regulator Co.; Division of Watts Water Technologies, Inc.

f. Wilkins; Zurn Plumbing Products Group.

5. Dielectric Flange Kits

a. Advance Products & Systems, Inc.

b. Calpico Inc.

c. Central Plastics Company.

d. Pipeline Seal and Insulator, Inc.

e. Or approved equal.

6. Main Shut-off Valves

a. Nordstrom.

b. Fisher

c. Dresser Industries Inc.

d. Walworth Company

e. Grinnel

7. Ball Valves

a. Apollo.

b. Contromatics.

c. Conbraco

d. NIBCO

8. Bronze Plug Valves

a. Hammond.

b. Lee Brass Company.

c. McDonald.

d. NIBCO.

9. Cast Iron Non-Lubricated Plug Valves

a. McDonald.

b. Mueller Co.

c. Xomox Corporation.

10. Cast Iron Lubricated Plug Valves

a. Nordstrom.

b. Fisher

c. Dresser Industries Inc.

d. Walworth Company

11. Earthquake Valves

a. Pacific Seismic Products, Inc.

b. Quake Defense, Inc.

c. Strand Earthquake.

12. Gas Safety Shut-off Valves

a. Maxon Corporation.

b. Or Approved Equal.

2.2 NATURAL GAS PIPING, BURIED

A. Pipe: Black steel, ASTM A53/A53M, Schedule 40. Shop-applied pipe coating shall be one of the following types:

1. Coal Tar Enamel Coating: Exterior of pipe and fittings shall be cleaned, primed with Type B primer and coated with hot-applied coal tar enamel with bonded layer of felt wrap in accordance with AWWA C203. Asbestos felt shall not be used; felt material shall be fibrous glass mat in accordance with AWWA C203.

B. Holiday Inspections: Procedure for holiday inspection: Holiday Inspection shall be conducted on all coatings to determine the presence and number of discontinuities in those coatings using an applicable NACE standard such as SP0274 or SP0490 in the case thermosetting epoxy coating. Holiday Detectors shall be calibrated and supplied with a certificate of calibration from the factory. A calibration of the Holiday Detector shall be performed once every 6 months to verify output voltages are true and correct.

C. Steel Fittings:

1. Butt weld fittings, wrought steel, ASME B16.9.

2. Socket weld and threaded fittings forged steel, ASME B16.11.

3. Grooved End: Ductile iron (ASTM A536, Grade 65-45-12), malleable iron (ASTM A47/A47M, Grade 32510), or steel (ASTM A53/A53M, Type

F or Type E or S, Grade B).

D. Steel Joints: Welded, ASME B31.8.

E. Thermoplastic (Polyethylene PE): PE pipe and heat fusion fittings shall conform to ASTM D2513, SDR 11 and manufactured for 125 psig working pressure. Pipe and fittings shall have heat fusion joints PE pipe and fitting materials for heat fusion shall be compatible to ensure uniform melting and a proper bond.

F. Fittings:

1. Socket Fusion Fittings: ASTM D2683.

2. Butt Fusion Fittings: ASTM D3261, molded and matching pipe dimensions.

G. Risers: Manufacturer's standard anodeless type riser, transition from plastic to steel pipe with fusion bonded epoxy coating. Inlet connection socket or butt weld or swaged gas tight construction with O ring seals, metal insert, and protective sleeve. Outlet or above ground connection end shall be threaded or flanged. Riser shall comply with ASTM A53/A53M, Type F and E, Grade A, Schedule 40.

H. Polyethylene ball valves, ASME B16.40 shall be manufactured and rated for underground gas service. Operating pressure to 125 psig. Valve shall be maintenance and corrosion free. Polyethylene valves shall be full port opening type. Valves shall be wrench operated. Wrench operated valves shall have a 2 inch square adaptor securely fastened to the valve stem. Polyethylene valves shall be installed by butt fusion method.

2.3 NATURAL GAS PIPING, ABOVE GRADE

A. Pipe: Black steel, ASTM A53/A53M, Schedule 40.

B. Nipples: Steel, ASTM A733, Schedule 40.

C. Fittings:

1. 2 inch under ASME B16.3 threaded malleable iron.

2. 2 inch and up to 4 inch ASME B16.11 socket welded.

3. 4 inch ASME B16.9 butt welded.

D. Joints: Provide welded or threaded joints.

E. Threaded Metallic Joints: Threaded joints in metallic pipe shall have tapered threads evenly cut. Metal screwed pipe joints shall be made leak-tight by applying pipe thread sealant to all threaded joints. Care must be taken to prevent the pipe dope compound from getting inside the internal pipeline. Teflon tape type sealant is prohibited.

2.4 PIPING

A. Inside steel piping:

1. For low pressure 0.5 psig or less use standard weight black steel pipe with 150 psig threaded malleable iron fittings for piping 4 in. and smaller.

2. For pressure above 5 psig, all piping shall be welded.

B. Underground piping:

1. Steel pipe with Dresser type and steel welding fittings. Pre-wrap with Mill- wrapped corrosion protection extruded polyolefin coating in accordance with Gas Company requirements, equal to Energy Coating Co. or PlexCo.

2. High density polyethylene pipe and fittings in accordance with ASTM D- 2513, Grades 2306, 3306, and 3408 with fusion joints only, equal to Driscopipe 8100-DRII Series.

C. Underground drips shall be AGA and local gas company approved and shall be cast iron or tar coated welded steel pots with adjustable tar coated cast iron extension shaft and flush box with lock type extra heavy cast iron cover marked GAS DRIP.

D. In no case shall any gas pipe be less than ¾ inch.

2.5 REGULATOR VENT PIPING, ABOVE GRADE

A. Indoors: Same as natural gas piping, above grade.

B. Outdoors: PVC pipe, tubing, and fittings, UL 651.

2.6 UNIONS AND FLANGES

A. Unions for Pipe 2 inches and Smaller:

1. Ferrous Piping: Class 150, malleable iron, threaded.

2. Copper Piping: Class 150, bronze unions with soldered brazed joints.

B. Flanges for Pipe 2-1/2 inches and Larger:

1. Ferrous Piping: Class 150, forged steel, slip-on flanges.

2. Copper Piping: Class 150, slip-on bronze flanges.

3. Gaskets: 1/16 inch thick preformed neoprene gaskets.

2.7 STRAINERS

A. 2 inch and Smaller: Screwed brass or iron body for 175 psig working pressure, Y pattern with 1/32 inch stainless steel perforated screen.

B. 2-1/2 inch to 4 inch: Flanged iron body for 175 psig working pressure, Y pattern with 3/64 inch stainless steel perforated screen.

C. 5 inch and Larger: Flanged iron body for 175 psig working pressure, basket pattern with 1/8 inch stainless steel perforated screen.

2.8 NATURAL GAS PRESSURE REGULATORS

A. Product Description: Spring loaded, general purpose, self-operating service regulator including internal relief type diaphragm assembly and vent valve. Diaphragm case can be rotated 360 degrees in relation to body.

1. Comply with ANSI Z21.80.

2. Temperatures: minus 20 degrees F to 150 degrees F.

3. Body: Cast iron with neoprene gasket.

4. Spring case, lower diaphragm casing, union ring, seat ring and disk holder: Aluminum.

5. Disk, diaphragm, and O-ring: Nitrile.

6. Minimum Inlet Pressure: 5 psi.

7. Furnish sizes 2 inches and smaller with threaded ends. Furnish sizes 2-1/2 inches and larger with flanged ends.

B. Service Pressure Regulators: Comply with ANSI Z21.80.

1. Body and Diaphragm Case: Cast iron or die-cast aluminum.

2. Springs: Zinc-plated steel; interchangeable.

3. Diaphragm Plate: Zinc-plated steel.

4. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.

5. Orifice: Aluminum; interchangeable.

6. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.

7. Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator.

8. Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 150 percent of design discharge pressure at shutoff.

9. Overpressure Protection Device: Factory mounted on pressure regulator.

10. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.

11. Maximum Inlet Pressure: 60 psig.

2.9 NATURAL GAS PRESSURE RELIEF VALVES

A. Product Description: Spring loaded type relief valve.

1. Body: Aluminum.

2. Diaphragm: Nitrile.

3. Orifice: Stainless steel.

4. Maximum operating temperature: 150 degrees F.

5. Inlet Connections: Threaded.

6. Outlet or Vent Connection: Same size as inlet connection.

2.10 UNDERGROUND LABELING

A. Detectable Warning Tape: Acid and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored yellow.

2.11 DIELECTRIC FITTINGS

A. Provide dielectric couplings or unions between ferrous and non-ferrous pipe.

B. Dielectric Unions:

1. Minimum Operating-Pressure Rating: 150 psig.

2. Combination fitting of copper alloy and ferrous materials.

3. Insulating materials suitable for natural gas.

4. Combination fitting of copper alloy and ferrous materials with threaded, brazed joint, plain, or welded end connections that match piping system materials.

C. Dielectric-Flange Kits:

1. Minimum Operating-Pressure Rating: 150 psig.

2. Companion-flange assembly for field assembly.

3. Include flanges, full-face or ring-type neoprene or phenolic gasket, phenolic or PE bolt sleeves, phenolic washers, and steel backing washers.

4. Insulating materials suitable for natural gas.

5. Combination fitting of copper alloy and ferrous materials with threaded, brazed-joint, plain, or welded end connections that match piping system materials.

2.12 GAS VENT TERMINALS

A. ¾ in. and one (1) in. aluminum threaded vent terminal with 16 x 16 mesh 0.018 gauge stainless steel screen.

B. 1¼ in. to 4 in. standard pipe threaded elbow with 12 x 12 mesh stainless steel screen.

1. Equal to Upsco Inc.

C. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.

1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.

2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.

3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.

4. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

a. Material Group: 1.1.

b. End Connections: Threaded or butt welding to match pipe.

c. Lapped Face: Not permitted underground.

d. Gasket Materials: ASME B16.20, metallic, flat, asbestos free, aluminum o-rings, and spiral-wound metal gaskets.

e. Bolts and Nuts: ASME B18.2.1, carbon steel aboveground and stainless steel underground.

5. Protective Coating for Underground Piping: Factory-applied, three-layer coating of epoxy, adhesive, and PE.

a. Joint Cover Kits: Epoxy paint, adhesive, and heat-shrink PE sleeves.

2.13 VALVES

A. Manual Shut-off Valves Inside Building.

1. General Requirements for Metallic Valves, NPS 2 and Smaller: Comply with ASME B16.33.

a. CWP Rating: 125 psig.

b. Threaded Ends: Comply with ASME B1.20.1.

c. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.

d. Tamperproof Feature: Locking feature for valves where required by the SDG&E.

e. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.

f. Service Mark: Valves 1-1/4 inches to NPS 2 shall have initials "WOG" permanently marked on valve body.

g. Threaded cast iron body, 125 PSIG WOG.

2. General Requirements for Metallic Valves, NPS 2-1/2 and Larger: Comply with ASME B16.38.

a. CWP Rating: 125 psig.

b. Flanged Ends: Comply with ASME B16.5 for steel flanges.

c. Tamperproof Feature: Locking feature for valves where required by Con. Ed.

d. Service Mark: Initials "WOG" shall be permanently marked on valve body.

e. 2½ in. to 4-in.: Flanged cast iron body lubricated tapered plug type, 175 psig WOG.

f. 6 in. and larger: Flanged cast iron body lubricated tapered plug type, 200 psig WOG, worm gear operated.

3. Provide 2 wrenches for each size used.

a. Attach wrench to each valve.

B. Ball Valves

1. On local branches three inches and smaller, provide threaded three piece full port wafer-type ball valve with bronze body, ball stem, Teflon seats, and level handles, 300 psig WOG.

C. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.

1. 2 inch and smaller: Threaded brass ball valves with full port TFE sears and blowout proof stem, 600 psig WOG.

2. Body: Bronze, complying with ASTM B 584.

3. Ball: Chrome-plated bronze.

4. Stem: Bronze; blowout proof.

5. Seats: Reinforced TFE; blowout proof.

6. Packing: Threaded-body packnut design with adjustable-stem packing.

7. Ends: Threaded, flared, or socket.

8. CWP Rating: 600 psig.

9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.

10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

D. Bronze Plug Valves: MSS SP-78.

1. Body: Bronze, complying with ASTM B 584.

2. Plug: Bronze.

3. Ends: Threaded, socket, or flanged.

4. Operator: Square head or lug type with tamperproof feature where indicated.

5. Pressure Class: 125 psig.

6. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.

7. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

E. Cast-Iron, Non-lubricated Plug Valves: MSS SP-78.

1. Body: Cast iron, complying with ASTM A126, Class B.

2. Plug: Bronze or nickel-plated cast iron.

3. Seat: Coated with thermoplastic.

4. Stem Seal: Compatible with natural gas.

5. Ends: Threaded or flanged as indicated.

6. Operator: Square head or lug type with tamperproof feature where indicated.

7. Pressure Class: 125 psig.

8. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.

9. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

F. Cast Lubricated Plug Valves Inside Building:

1. 2-inch and smaller: Cast iron body, threaded, equal to Nordstrom Valves, Inc. Figure 114.

2. 2½ inch to 4-inch: Flanged cast iron body lubricated tapered plug type, 175 psig WOG, equal to Nordstrom Valves, Inc. Figure 115.

3. 6 inch and larger: Flanged cast iron body lubricated tapered plug type, 200 psig WOG, worm gear operated, equal to Nordstrom Valves, Inc. Figure 165.

4. Valves 2 ½ inch and larger shall be flanged.

5. Provide 2 wrenches for each size used.

6. Attach wrench to each valve.

7. Gas Cocks:

a. Gas cocks shall be for use only as manual gas shut-off valves at each piece of gas burning equipment; shall be of the plug type, bronze construction with check, nut and washer bottom and tee handle.

b. Gas cocks shall be Figure 10596 as manufactured by A.Y. McDonald Mfg. Co., or Series 52 as manufactured by Conbraco Industries, Inc.

c. Gas cocks shall only be used on piping 1 inch and smaller.

G. Valves Underground (Curb Type)

1. Provide welding end steel body tapered lubricated plug type with iron plug high head extension.

a. 2 inch to 4 inch: 200 psig WOG, equal to Nordstrom No. 1943.

b. 6 inch and larger: 275 psig WOG, equal to Nordstrom No. 4185.

2. Provide with adjustable tar coated cast iron extension shaft and flush box with lock type extra heavy cast iron cover marked GAS. Provide two operating wrenches.

H. Valve Boxes:

1. Cast-iron, two-section box. Each cast iron box shall be given a heavy

coat of bituminous paint.

2. Top section with cover with "GAS" lettering.

3. A metal tag or label shall be installed on top or inside of each valve box lid. The tag shall designate the appropriate location number, valve size, and other pertinent information.

4. Bottom section with base to fit over valve and barrel a minimum of 5 inches in diameter.

5. Adjustable cast-iron extensions of length required for depth of bury.

6. Include tee-handle, steel operating wrench with socket end fitting valve nut or flat head, and with stem of length required to operate valve.

2.14 EARTHQUAKE VALVES

A. Earthquake Valves: Comply with ASCE 25.

1. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction.

2. Maximum Operating Pressure: 60 psi.

3. Cast-aluminum body with stainless-steel internal parts.

4. Nitrile-rubber, reset-stem o-ring seal.

5. Valve position, open or closed, indicator.

6. Composition valve seat with clapper held by spring or magnet locking mechanism.

7. Level indicator.

8. End Connections: Threaded for valves NPS 2 inches and smaller; flanged for valves NPS 2-1/2 inches and larger.

2.15 GAS SAFETY SHUTOFF VALVES

A. Gas safety shut-off valves shall be FM & UL listed, electric motor operated, normally closed, manual reset type. Valves shall be rising stem design with a
straight through flow path with metal-to-metal seat and disc arrangement. The valve seat shall be stainless steel and the disc ductile iron. Valves shall be provided with a NEMA 4 enclosure modified for Class I, Division II hazardous locations, be provided with an electrical terminal block and shall operate on 120 V AC., 60 Cycles, single phase. Valves shall meet ANSI Class VI leakage standard and shall be provided with a visual indicator to note the position of the valve whether "OPEN" or "SHUT".

B. Gas safety shut-off valves 2 inches and smaller shall be threaded, 2 1/2 inches and larger shall be flanged. Flanged valves shall be provided with companion flange set by valve manufacturer.

C. Gas safety shut-off valves shall be installed in the following locations:

1. On the firm gas line downstream of its meter and before any branch take- offs.

D. Gas safety shut-off valves shall be wired to the gas leak detection system and shall function to shut off all gas supply to the building upon:

1. Action of the gas leak detection system (alarm condition), and,

2. Loss of normal electrical power.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect delivered equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all items.

3.2 INSTALLATION

A. General: Comply with the ICC IFGC, ICC IPC and the following:

1. Install branch piping for fuel gas and connect to all fixtures, valves, cocks, outlets, casework, cabinets and equipment, including those furnished by the Government or specified in other sections.

2. Pipe shall be round and straight. Cutting shall be done with proper tools. Pipe shall be reamed to full size after cutting.

3. All pipe runs shall be laid out to avoid interference with other work.

4. Install valves with stem in horizontal position whenever possible. All valves shall be easily accessible.

5. Install union and shut-off valve on pressure piping at connections to equipment.

6. Pipe Hangers, Supports and Accessories:

a. All piping shall be supported per the ICC IFGC.

b. Shop Painting and Plating: Hangers, supports, rods, inserts and accessories used for Pipe supports shall be shop coated with red lead or zinc Chromate primer paint. Electroplated copper hanger rods, hangers and accessories may be used with copper tubing.

c. Floor, Wall and Ceiling Plates, Supports, Hangers:

1) Solid or split unplated cast iron, chrome plated in finished areas.

2) All plates shall be provided with set screws.

3) Pipe Hangers: Height adjustable clevis type.

4) Adjustable Floor Rests and Base Flanges: Steel.

5) Concrete Inserts: "Universal" or continuous slotted type.

6) Hanger Rods: Mild, low carbon steel, fully threaded or Threaded at each end with two removable nuts at each end for positioning rod and hanger and locking each in place.

7) Riser Clamps: Malleable iron or steel.

8) Rollers: Cast iron.

9) Self-drilling type expansion shields shall be "Phillips" type, with case hardened steel expander plugs.

10) Miscellaneous Materials: As specified, required, directed or as noted on the drawings for proper installation of hangers, supports and accessories.

7. Install cast chrome plated escutcheon with set screw at each wall, floor and ceiling penetration in exposed finished locations and within cabinets and millwork.

8. Penetrations:

a. Fire Stopping: Where pipes pass through fire partitions, fire walls, smoke partitions, or floors, install a fire stop that provides an effective barrier against the spread of fire, smoke and gases as specified in Section 07 84 00, FIRESTOPPING. Completely fill and seal clearances between piping and openings with the fire stopping materials.

b. Waterproofing: At floor penetrations, completely seal clearances around the pipe and make watertight with sealant as specified in Section 07 92 00, JOINT SEALANTS.

B. Fuel gas piping shall conform to the following:

1. Entire fuel gas piping installation shall be in accordance with requirements of NFPA 54.

2. Provide fuel gas piping with plugged drip pockets at low points.

3. Seismic Data: Refer to Division 13 and Contract Drawings. Install automatic shutoff valve (earthquake valve) on discharge side of meter. Valve shall positively shut off supply of gas in case of pressure failure, remain shut off until manually reopened, and be provided with outside adjustment for reset.

C. If an installation is unsatisfactory to the COR, the Contractor shall correct the installation at no additional cost or time to the Government

D. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

E. Remove scale and dirt, on inside and outside, before assembly.

F. Prepare piping connections to equipment with flanges or unions.

G. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

H. Field verify that connection to existing piping systems sizes, locations, and invert are as required.

I. Establish elevations of buried piping with not less than allowed per code.

J. Establish minimum separation of from other piping services in accordance with code.

3.3 NATURAL GAS SYSTEM INSTALLATION

A. Install piping free from traps and with drain pocket consisting of nipple and cap at low points for inside building and drip pot for underground piping.

B. Install shut-off valves at connection to each piece of equipment. Provide union or right and left nipple and coupling at equipment side of individual shut-off valve.

C. Install strainers on high pressure side of pressure reducing valves, on inlet side of indicating and control instruments and equipment subject to sediment damage and where shown on drawings. Strainer element shall be removable without disconnection of piping.

D. Install gas meter in a well ventilated and accessible location. Gas meter room (3 hr. rated enclosure) with explosion-proof fixtures.

E. Threaded Joints:

1. Make-up joints with U.L. listed gas resistant Teflon tape or Teflon paste, suited for gas piping.

F. Provide a two elbow-swing on all branches taken from a riser.

G. Provide valve tags for piping systems indicating the operating system pressure.

H. Color code piping at different pressures within the gas meter room. Paint fifteen

(15) to five (5) psi system brown and reduced pressure piping yellow.

I. Welders must be qualified in accordance with either API 1104 or ASME IX Boiler and Pressure Vessel Code and as required by local code.

J. Provide sign on the exterior of the gas meter door shall be provided with bold lettering at least 1 in. high and properly spaced with lettering and background in contrasting colors reading “Gas Meter Room - No Storage Permitted.”

K. Support horizontal gas piping as follows:

1. ½ in. - 6 ft. on center.

2. ¾ in. or 1 in. - 8 ft. on center.

3. 1¼ in. or larger - 10 ft. on center.

4. Vertical piping at every floor.

L. Provide remote meter reading communication wiring to connect to building automation system. Wire gauge per manufacturer recommendation for distance required.

3.4 PIPING INSTALLATION, OUTDOOR

A. Comply with NFPA 54 Fuel Gas Code for installation and purging of natural-gas piping.

B. Install underground, natural-gas piping buried at least 22 inches below finished grade as required.

1. If natural-gas piping is installed less than 72 inches below finished grade, install it in ductile iron pipe containment conduit.

2. Coordinate with site paving contractor for finished grade location.

3. Protect exterior underground pipe from damage due to heavy equipment traffic during construction.

C. Install underground, PE, natural-gas piping according to ASTM D2774.

3.5 PIPING INSTALLATION, INDOOR

A. Comply with NFPA 54 Fuel Gas Code for installation and purging of natural-gas piping.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations.

C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.

D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

G. Locate valves for easy access.

1. Piping:

a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep- pattern type.

b. Piping at Wall and Floor Penetrations in Finished Spaces: One- piece, stamped-steel type.

c. Piping at Ceiling Penetrations in Finished Spaces: One-piece or split-casting, cast-brass type with polished chrome-plated finish.

d. Piping in Unfinished Service Spaces: One-piece, stamped-steel type with set screw.

e. Piping in Equipment Rooms: One-piece, cast-brass type.

f. Piping in Equipment Rooms: One-piece, stamped-steel type with set screw.

g. Piping at Floor Penetrations in Equipment Rooms: One-piece, floor- plate type.

H. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials as required.

I. Verify final equipment locations for roughing-in.

J. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.

K. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.

1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.

L. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.

M. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.

N. Concealed Location Installations: Except as specified below, install concealed natural-gas piping and piping installed under the building in containment conduit constructed of steel pipe with welded joints as described in Part 2. Install a vent pipe from containment conduit to outdoors and terminate with weatherproof vent cap.

1. Above Accessible Ceilings: Natural-gas piping, fittings, valves, and regulators may be installed in accessible spaces without containment conduit.

2. In Walls or Partitions: Protect tubing installed inside partitions or hollow walls from physical damage using steel striker barriers at rigid supports.

a. Exception: Tubing passing horizontally through partitions or walls does not require striker barriers.

3. Prohibited Locations:

a. Do not install natural-gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or ventilating ducts, or dumbwaiter or elevator shafts.

b. Do not install natural-gas piping embedded in concrete walls or partitions.

O. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.

P. Connect branch piping from top or side of horizontal piping.

Q. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment. Unions are not required at flanged connections.

R. Do not use natural-gas piping as grounding electrode.

S. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.

T. Install pressure gauge upstream and downstream from each line regulator as required.

3.6 UTILITY SERVICE METER INSTALLATION

A. Install service-meter assemblies aboveground, on concrete bases.

B. Install metal shutoff valves upstream from service regulators.

C. Install strainer on inlet of service-pressure regulator and meter set.

D. Install service regulators mounted outside with vent outlet horizontal or facing down. Install screen in vent outlet if not integral with service regulator.

E. Install metal shutoff valves upstream from service meters.

F. Install service meters downstream from pressure regulators.

G. Install metal bollards to protect meter assemblies as required.

H. Install meters on full size gas headers.

3.7 VALVE INSTALLATION

A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, aluminum, or copper connector.

B. Install underground valves with valve boxes.

C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.

D. Install earthquake valves aboveground outside buildings according to listing.

E. Install anode for metallic valves in underground PE piping.

3.8 HANGER & SUPPORT INSTALLATION

A. Install seismic restraints on piping as required.

B. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 1 and Smaller: Maximum span, 96 inches; minimum rod size, 3/8 inch.

2. NPS 1-1/4: Maximum span, 108 inches; minimum rod size, 3/8 inch.

3. NPS 1-1/2 and NPS 2: Maximum span, 108 inches; minimum rod size, 3/8 inch.

4. NPS 2-1/2 to NPS 3-1/2: Maximum span, 10 feet; minimum rod size, 1/2 inch.

5. NPS 4 and Larger: Maximum span, 10 feet; minimum rod size, 5/8 inch.

C. Install hangers for horizontal, corrugated stainless-steel tubing with the

following maximum spacing and minimum rod sizes:

1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.

2. NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.

3. NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod size, 3/8 inch

3.9 IDENTIFICATION

A. Identify new natural gas piping systems in accordance with requirements for CSA- B149.1.

B. Above ground natural gas piping to be primed and painted yellow along its entire length. All below ground propane piping to be covered with plastic yellow identification marker tape suitable for direct burial.

C. Supply and install "Natural Gas" pipe identification markers along length of natural gas piping installation in accordance with CSA-B149.1 and Section 23 05 53 01 - Mechanical Identification. Maximum spacing along straight length of pipe to be 20 feet.

D. Maintain minimum depth of burial of underground natural gas piping of 24 inches, unless otherwise noted.

3.10 TESTING

A. General: Test system either in its entirety or in sections after system is installed or cleaned.

B. Test shall be made in accordance with the International Fuel Gas Code. The system shall be tested at a minimum of 1.5 times maximum working pressure, but not less than 3 psig.

C. Comply with requirements of the local Authority Having Jurisdiction and the California Fuel Gas Code.

D. Minimum test pressure shall be 10 psi and test shall show no drop in pressure. Test duration shall not be less than 30 minutes in duration.

E. Record test pressure over the duration of the test with an automatic recording/printing gauge.

F. System Purging: After completing pressure tests, and before testing a gas-contaminated line, purge line with nitrogen at junction with main line to remove all air and gas. Clear completed line by attaching a test pilot fixture at capped stub-in line at building location and let gas flow until test pilot ignites. Procedures shall conform to NFPA 54 and ASME B31.8.

3.11 CLEANING

A. Clean all piping systems to remove all dirt, coatings and debris. Remove all valves, controls etc., and reinstall after piping system has been cleaned.

END OF SECTION

SECTION 26 05 05

GENERAL PROVISIONS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
1. Contractor shall provide all labor, materials, equipment, and incidentals shown, specified, and required to complete the electrical Work.
2. Contractor shall be responsible for all electrical demolition.
3. Common electrical installation requirements

B. Coordination:
1. Review installation procedures and schedules under other Specification Sections and coordinate with other trades the installation of electrical items that will be installed with or within formwork, walls, partitions, ceilings, panels, and site work.
2. Coordinate arrangement, mounting, and support of electrical equipment:
   a. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
   b. To provide for ease of disconnecting the equipment with minimum interference to other installations.
   c. To allow right of way for piping and conduit installed at required slope.
   d. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
3. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
4. Coordination and Intent of Electrical Drawings:
   a. Dimensions on Drawings related to equipment are based on equipment of certain manufacturers. Verify the dimensions of equipment furnished to space available at the Site and allocated to the equipment.
   b. Drawings show the principal elements of the electrical Work, and are not intended as detailed working drawings for the electrical Work. Drawings supplement and complement the Specifications and other Contract Documents relative to principal features of electrical systems.
   c. Equipment and devices provided under this Contract shall be properly connected and interconnected with other equipment and devices for successful operation of complete systems, whether or not all connections and interconnections are specifically mentioned or shown in the Contract Documents.
   d. Drawings are provided for Contractor's guidance in fulfilling the intent of the Contract Documents. Contractor shall comply with Laws and Regulations, including safety and electrical codes, and provide materials, equipment, appurtenances, and specialty items necessary for complete and operable systems.

5. Obtain from Owner record drawings required to execute the Work.
6. Field Coordination:
    a. Provide materials, equipment, and services to interface with existing circuits. Field-verify system and equipment requirements prior to modifying existing systems.
    b. Coordinate the interface of equipment with field condition and Engineer.
    c. Field-compare existing starter and panel control circuit terminations from record documents with existing circuits.
    d. Field-trace existing circuits as required to interface the equipment provided.
    e. Field-identify terminations for starters and panel controls for follow function for re-connection.

C. Area Classifications:
1. Materials, equipment, and incidentals shall be suitable for the area classification(s) shown, specified, and required.
2. Wet Locations: Comply with NEC and NEMA requirements for wet locations. Enclosures in wet locations shall be stainless steel and comply with NEMA 4X unless specified otherwise.
3. Corrosive Locations: Comply with NEC and NEMA requirements for corrosive locations. Enclosures in corrosive locations shall be stainless steel and conform to NEMA 4X requirements unless specified otherwise.
4. Hazardous Locations: Comply with NEC requirements for the Class and Division designated.
5. Dusty Locations: Indoor areas not designated as hazardous, corrosive, or wet are dusty locations. Comply with NEC and NEMA 12 requirements unless specified otherwise.

1.2 QUALITY ASSURANCE

A. Qualifications:
1. Electrical Subcontractor:
    a. Electrical Subcontractor shall possess a valid electricians' and contractors' license in the jurisdiction where the Site is located.
    b. If requested by Engineer, submit the following information for not less than three successful, completed projects: project name and location; year completed; name and contact information for: prime Contractor for whom electrical Subcontractor worked, project Owner, and project Engineer or architect, including addresses and telephone numbers.
2. Wiring Coordination:
    a. Contractor shall be responsible for preparing complete point-to-point interconnection wiring diagrams. Diagrams shall identify all external interconnecting wiring associated with new or modified existing equipment.
    b. Develop diagrams for performing the Work and to document terminations. Prepare diagrams in accordance with this Section and the example wiring diagram accepted by Engineer. Diagrams are in addition to loop diagrams required in Section 40 61 13, Process Control Systems General Provisions.

B. Component Supply and Compatibility:
1. Materials and equipment similar to each other shall be from the same manufacturer for uniformity.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Method of Delivery
   1. If delivery is by truck, Bidder shall specify the anticipated type of vehicle: box truck, van, flatbed, stake bed, semitrailer, etc.
   2. Bidder shall include information regarding special conditions such as over-sized dimensions or heavy axial loading.

B. Delivery Off-Loading
   1. Bidder shall describe the off-loading process at the point of delivery including equipment requirements such as, but not limited to, powered-lift gate, fork-lift, crane (lift hooks, slings, spreaders, etc.).
   2. Bidder shall include the time allowed for off-loading.

C. Installation
   1. Bidder shall provide a full description of installation and assembly services provided by Bidder, including manpower, and an inclusive list of trades to be provided by Purchaser to complete the installation and assembly process.

1.4 SUBMITTALS

A. Action Submittal. Submit the following:
   1. Product Data
      a. Electrical Systems - Product Data
         1) Manufacturer's name and product designation or catalog number.
         2) Electrical ratings.
         3) Manufacturer's technical data and specifications.
         4) Manufacturer's indication of compliance with applicable reference standards.
         5) Painting and coating systems proposed.
   2. Shop Drawings
      a. Internal Wiring Diagram and Drawings
         1) Must indicate all connections to components and numbered terminals for external connections.
      b. Dimensioned Plan, Section, Elevations, and Panel Layouts
         1) Show means for mounting, conduit connection, and grounding.
      c. Components List
         1) Include manufacturer's name and catalog number (or part number) for each.
      d. Point-to point Interconnection Wiring Diagrams.

B. Informational Submittals. Submit the following:
   1. Certificates
      a. Manufacturer's Certificate of Compliance with Applicable Reference Standards.
   2. Test and Evaluation Reports
      a. Electrical Systems - Test Procedures
         1) Proposed testing procedures and testing limitations for source quality control testing and field quality control testing.
   3. Manufacturers' Instructions
      a. Electrical Systems - Manufacturer's Instructions
         1) Installation data and instructions.
         2) Instructions for handling, starting-up, and troubleshooting.

4. Source Quality Control Submittals
    a. Electrical Systems - Source Quality Control Test Results
        1) Results for required shop testing.
5. Field Quality Control Submittals
    a. Electrical Systems Field Quality Control Test Results
        1) Results for required field testing
6. Qualifications Statements
    a. Electrical Subcontractor Qualification Statement

C. Closeout Submittals. Submit the following:
1. Record Documentation
    a. Electrical System Record Drawings
        1) One-line wiring diagram of the electrical distribution system.
        2) Actual, in-place conduit and cable layouts with schedule of conduit sizes and number, and size of conductors.
        3) Layouts of the power and lighting arrangements and the grounding system.
        4) Control schematic diagrams, with terminal numbers and control devices identified, for all equipment.
        5) Panel Schedules with circuit numbers and loads.
        6) Record documents shall indicate final equipment and field installation information.
        7) Instrumentation and Control Wiring Diagrams shall include the following:
            a) electrical schematics of, but not be limited to; electrical enclosures, instrumentation, and interconnects to field devices.
        8) Point-to-Point Interconnection Wiring Diagram Drawings: Include the following:
            a) External control wiring for each piece of equipment, panel, instrument, and other devices and wiring to control stations and motor controllers.
            b) Numbered terminal block identification for each wire termination.
            c) Identification of the assigned wire numbers for all interconnections.
            d) Identification of wiring by the conduit tag in which the wire is installed.
            e) Terminal, junction, and pull boxes through which wiring is routed.
            f) Identification of equipment and the submittal transmittal number for equipment from which wiring requirements and termination information was obtained.
        9) Submittals shall be Editable AutoCAD file (.dwg format) of installed Wiring Diagram. AutoCAD file shall be in the current version of AutoCAD used by the Owner.

PART 2 PRODUCTS

2.1 Performance Criteria:

A. Electrical equipment shall be capable of operating successfully at full-rated load, without failure, with ambient outside air temperature of (--1--) degrees F to (--2--) degrees F and an elevation of (--3--) feet above mean sea level.

B. Unless specified otherwise, electrical equipment shall have ratings based on 75 degrees C terminations.

2.2 Testing Laboratory Labels: Electrical material and equipment shall bear the label of Underwriters' Laboratories, Inc. or other nationally recognized, independent testing laboratory, where standards have been established and label service applies.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine conditions under which Work will be performed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:
   1. Install materials and equipment in accordance with the Contract Documents, Laws and Regulations, approved (and accepted, as applicable) Shop Drawings and other Contractor submittals, and manufacturer's recommendations.
   2. Define and identify all wiring, circuit terminations, and equipment to be modified to ensure proper interface of components. The Contract Price includes all costs associated with field services specified for a complete and functional system.
   3. Perform work in a neat and workmanlike manner.

B. Common Requirements for Electrical Installation
   1. Comply with NECA 1.
   2. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
   3. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
   4. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
   5. Right of Way: Give to piping systems installed at a required slope.

C. Staging, Sequencing, and Coordination with Existing Facilities:
   1. Schedule, sequence, and install materials and equipment in accordance with Section 01 11 00, Summary of Work.
   2. Perform the Work in a manner that will not interfere with the existing equipment and facilities or cause interruption of the functions of the Site, unless specified otherwise or otherwise allowed by Engineer.
   3. When operation of existing facilities and Site is to be disrupted due to Contractor's operations, coordinate with Engineer.
   4. Where the Work ties in with existing installations, take precautions and provide safeguards in connecting the Work to existing operating circuits to prevent interruption to existing circuits. Connection of Work to existing circuits shall be performed in the presence of Engineer.

5. Interruptions of existing circuits shall be coordinated with the Engineer who will determine the length of time a circuit may be de-energized to maintain processes in dependable and safe operation.

3.3 FIELD QUALITY CONTROL

A. Field Quality Control – General:
   1. Perform field quality control for electrical Work in accordance with the Contract Documents.

B. Site Tests:
   1. Prior to requesting certificate of Substantial Completion, demonstrate to Engineer that electrical systems and electrically-operated equipment installed or modified under the Contract operates in accordance with the Contract Documents and operates as required.
   2. Perform the following operational tests on electrical systems:
      a. Operate power circuits to verify proper operation and connection to electrical systems materials and equipment.
      b. Operate control circuits, including pushbuttons, indicating lights, and similar devices, to verify proper connection and function. Operate all devices, such as pressure switches, flow switches, and similar devices, to verify that shutdowns and control sequences operate as required.
   3. Prepare and submit report on the equipment demonstration and operating field quality control tests. Report shall include complete information on the tests performed and results.

C. Manufacturer's Services:
   1. Furnish at the Site qualified, factory-trained representative(s) of equipment manufacturers for the services indicated in the Contract Documents.

END OF SECTION

SECTION 26 05 13

MEDIUM VOLTAGE CABLES

PART 1 GENERAL

1.1 SCOPE

A. The work under this section includes furnishing and installing medium voltage cable including pulling, racking, splicing, and terminating. Included are the following topics:

1.2 Definition

A. Manufacturer: The company which owns controlling interest in the factory actually producing the cable being furnished for this project.

1.3 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.4 Submittals

A. Submit product data indicating cable and accessory construction, materials, ratings, and all other parameters identified in Part 2 - Products below.

B. Submit manufacturer's installation instructions.

C. Submit manufacturer's certificate stating approval for field acceptance testing per National Electrical Testing Association standards (at least 35 kV DC for 5 kV rated cable and 64 kV DC for 15 kV rated cable).

D. Submit manufacturer's certificate stating that medium voltage cable meets or exceeds all requirements specified below.

1.5 Project Record Documents

A. Accurately record exact sizes, lengths, types, locations, and quantities of cables. Also show where all splices are located for each cable.

1.6 Quality Assurance

A. The manufacturer shall be a company specializing in the manufacture of medium voltage cable and/or accessories with minimum five years documented experience in producing cable and/or accessories similar to those specified below.

B. The cable materials and manufacture shall meet or exceed all applicable requirements of the Current Editions of ICEA Standard S-93-639, UL 1072 and NEMA standards.

C. The cable shall be manufactured using a triple extrusion process in which the conductor shield, insulation, and insulation shield are installed at essentially the same time without an intervening storage period on reels or other storage devices.

D. The Contractor shall be a company with experience in the installation of medium voltage cable, medium voltage equipment and components. The company shall have documented history with a minimum of two similar medium voltage projects.

E. The Contractor shall have a minimum of two qualified electricians trained and experienced (Minimum of two similar medium voltage projects) in the installation of medium voltage cable, medium voltage equipment and components.

F. At the discretion of the Engineer, documentation of experience, and relevant projects shall be furnished by the contractor.

G. Workmen involved in splicing and termination of cables shall have been specifically trained in the procedures required for the splices and terminations used in this project.

H. At the discretion of the Engineer, documentation of experience and/or training in medium voltage cable splicing and termination shall be furnished by the Contractor.

1.7 Delivery, Storage and Handling

A. Cable shall be stored according to manufacturer's recommendations as a minimum. In addition, cable must be stored in a location protected from vandalism and weather. If cable is stored outside, it must be covered with opaque plastic or canvas with provision for ventilation to prevent condensation and for protection from weather. If air temperature at cable storage location will be below 32 degrees F., the cable shall be moved to a heated (50 degrees F minimum) location. If necessary, cable will be stored off site at the Contractor's expense.

PART 2 - PRODUCTS

2.1 General

A. All cable shall be new, delivered to the site, and be less than two years since manufacture. It shall be from manufacturer's stock; not suppliers' warehouse stock. Manufacturer's certification of factory test values shall be submitted for all cable furnished. All specified dimensions are nominal.

B. Provide a 600 volt insulated copper ground conductor in all conduits with medium voltage cable. This ground conductor shall be the same size as the phase conductors. See Section 26 05 26 for more grounding requirements.

2.2 MEDIUM VOLTAGE CABLE – SHIELDED

A. Usage: This cable shall be used for all above and underground applications (except for jumper cable applications, see JUMPER CABLE below) and shall be contained in conduit or other raceways.

B. Cable: Single conductor, insulated cable rated 15 KV, 133% insulation level, ungrounded, NEC-UL Type MV-105. Sizes as indicated on the Drawings.

C. Conductor shield: extruded semiconductor with resistivity requirements of section 3.3 of ICEA S-93-639 for discharge-free designs and nonconducting high permittivity compound for discharge-resistant designs. Material shall be clean stripping from the conductor and firmly bonded to the overlying insulation.

D. Insulation: Extruded EPR (ethylene propylene rubber), rated at 15 KV, 133 per cent insulation level, nominal thickness of .220 inches.

E. Insulation Shield: The insulation shield shall consist of an extruded semiconducting layer directly over the insulation and a copper tape over the semiconducting covering. The tape shall be at least 5 mils (0.127 mm) thick and be spiral wrapped with a minimum 12.5 per cent overlap. The insulation shield shall meet all requirements of section 5 of ICEA S-93-639.

F. Jacket: Polyvinyl Chloride (PVC), black color with a jacket thickness meeting all requirements of ICEA S-93-639

G. Cable Rating: Continuous duty at 105 degrees C., wet or dry locations, suitable for underground duct installations, UL type MV-105.

2.3 JUMPER CABLE

A. Cable Rating: Continuous duty at 105 degrees C., wet or dry locations, suitable for underground duct installations, UL type MV-105.

B. Cable: Single conductor, flexible, non-shielded, insulated cable rated 15 KV, ungrounded. Size as indicated on the Drawings.

C. Conductor: Stranded, soft annealed copper.

D. Conductor shield: extruded semiconductor, clean stripping from the conductor and firmly bonded to the overlying insulation.

E. Insulation: Extruded EPR (ethylene propylene rubber), rated at 15 KV, minimum thickness of .175 inches

F. Cable Rating: Continuous duty at 90 degrees C., dry locations.

2.4 CABLE TERMINATIONS

A. Modular Molded Shrink Type Termination: IEEE 48; Class 1; [5] [15] KV. Kit form, suitable for use with cable specified, including slip-on type flexible skirted polymer or silicon rubber insulator. All terminations shall be skirted type. Termination shall be hot or cold shrink type with internal stress relief tube to distribute electric field (10% to 90% equipotential lines) over entire length of skirted insulator.

B. Submittal for approval shall show electric field distribution (via equipotential lines) of termination device.

C. Lugs shall be copper, long barrel, two hole or four hole and rated for the voltage applied. The lugs shall match the pads on the equipment to which the cable will be mounted.

D. If there will be more than one cable on an equipment pad approved spiders (or spacers) must be used. Cable attachment to equipment must match the equipment manufacturers UL labeling requirements (if the equipment is UL Listed) as a minimum. Unless the equipment is designed or listed for it, cable lugs may not be placed back to back on the equipment pad. In all cases, the termination and equipment must be taped with approved anti-tracking tape.

2.5 CABLE SPLICES

A. Modular Molded Shrink Type Splice: IEEE 404-1986; Class 1; 15 KV. Kit form, suitable for use with cable specified, including slip-on type flexible polymer or silicon rubber insulator. Splice shall be hot or cold shrink type with internal stress relief tube to distribute electric field (10% to 90% equipotential lines) over entire length of insulating material.

B. Molded body shall contain a built-in internal semiconducting layer which covers and contacts the splice barrel and the cable insulation layer to prevent electrical stress buildup inside the body. This semiconducting layer shall be bonded to and covered with a cured EPDM rubber or polymer insulating layer which, in turn, shall be bonded to and covered with a semiconducting layer and metallic shield and jacket.

C. Splicing sleeves shall be long barrel type and rated for the voltage applied.

D. The completed splice shall be approved for underground direct burial and water immersion service.

E. Submittal for approval shall show electric field distribution (via equipotential lines) of termination device.

PART 3 – EXECUTION

3.1 CABLE PULLING

A. Pump all water out of the manholes prior to beginning work.

B. Prior to pulling cable, a mandrel/swab 1/4 inch smaller than the duct diameter shall be pulled through duct run to insure adequate opening of duct run. Thoroughly swab conduits to remove foreign material before pulling cables.

C. Cables shall not be pulled from an outdoor (exterior) location when the outdoor (exterior) air temperature is below 32 degrees F.

D. Contractor shall furnish all required installation tools to facilitate cable pulling without damage to the cable jacket. Such equipment is to include, but be not limited to, sheaves, winches, cable reels and/or cable reel jacks, duct entrance funnels, pulling tension gauge, and similar devices. All equipment shall be of substantial construction

to allow steady progress once pulling has begun. Makeshift devices which may move or wear in a manner to pose a hazard to the cable shall not be used.

E. Cable ends shall be sealed and firmly held in the pulling device during the pulling operation.

F. Cable pulling shall be done in accordance with cable manufacturer's recommendations, except as modified herein, and ANSI/IEEE C2 standards. Manufacturer's recommendations shall be a part of the cable submittal. Recommended pulling tensions shall not be exceeded. Pulling bending radius shall not be less than that determined by the manufacturer or the NEC. Restrictions of pulling bending radius dimensions shall be strictly observed. Training bending radius shall not be less than 12 times cable diameter. Any cable bent or kinked to radius less than recommended dimension shall not be installed.

G. Actual pulling tensions shall be continuously monitored and permanently recorded in a log and submitted to the Engineer at the end of the project.

H. During pulling operation an adequate number of persons shall be present to allow cable observation at all points of duct entry and exit as well as to feed cable and operate pulling machinery.

I. Pulling lubricant shall be used to ease pulling tensions. Lubricant shall be water or silicone based of a type which is noninjurious to the cable material used. Wax based lubricants are not allowed. Lubricant shall not harden or become adhesive with age.

J. Avoid abrasion and other damage to cables during installation.

K. Where cables are left in manhole or switchgear overnight or more than 8 hours prior to termination, the cable ends shall be sealed with paraffin or shrink wrap caps and supported in a manner which will prevent entrance of moisture into the cable. Cable shall be terminated and energized as soon as possible.

3.2 CABLE ROUTING IN MANHOLES AND SWITCHGEAR

A. Certain manholes shall have the cable looped around the walls. If not indicated on drawings, the manhole nearest building plus every third manhole if feeder contains multiple manholes shall contain cable loop. In such cases, the cable shall circle the manhole at least 360 degrees. Where manholes are not to be looped, cable shall be routed on the walls with the longest distance between points of entry and exit. Arrange cables to avoid interference with duct entrances into manhole.

B. All new and existing cable in manholes shall be secured to racks on the manhole walls. Cables shall be secured to racks with split porcelain or polymer insulators and clamps or mounted on a heavy duty nonmetallic multi-mount cable support arm as manufactured by Underground Devices, Inc. Insulators shall be of adequate size to contain all three phases and the ground of a given circuit. Fastening cables directly to support channel will not be accepted.

C. Cables within switchgear shall be routed in a manner which will allow adequate room for bending and terminating cables. Cables must be secured in a manner which will not result in cable weight being placed on the termination electrical joint. Cable

support shall be made in a manner that does not force cable against grounded metal or which compresses cable diameter. Cable training bending radius shall be at least 12 times cable diameter. Any cable bent to a radius less than recommended dimension will not be accepted.

D. Jumper cable shall be routed in a manner that maintains adequate through-air separation between adjacent conductors and between conductors and any metallic or grounded surface.

3.3 SPLICES AND TERMINATIONS INSTALLATION

A. Splices are to be held to a minimum. Splice locations shall be determined by cable lengths available, pulling conditions and termination points. Splice locations are to be listed by the Contractor prior to cable purchase and a listing of such locations submitted to the Engineer for approval before final cable lengths are determined.

B. Only experienced electricians shall be employed in this phase of the work. Refer to QUALITY ASSURANCE above.

C. Follow cable manufacturer's and splice or termination manufacturer's installation instructions and ANSI/IEEE C2 standards.

D. Clean, white lint-free gloves shall be used to handle end of cable during tape wrapping procedures.

E. Termination or splicing of the copper conductors (both power and ground conductors) shall be made only with tool applied compression (swaged) fittings.

F. Ground system connections:
   1. Cable to bus: compression cable fitting bolted to bus with lock washers under nut.
   2. Cable to ground rod: approved bolted fitting with backing plate between cable and rod.

G. Ground cable shield at each termination and splice.

H. Splice or termination failure upon high potential acceptance test will require complete reconstruction of the joint to manufacturer's specifications. Make sure that there is enough free cable at each termination or splice for two more terminations or splices to be performed.

I. Install Scotch #70 tape for anti-tracking on all exposed terminations.

J. All splices and terminations are to be tagged using embossed plastic tags with plastic attachment devices indicating date splice or termination was made, name of electrician involved, name of Contractor installing cable, feeder number and circuit to and from data.

K. All cable splices in manholes shall be supported on both sides of the splice within 2'0" of the splice. Splices shall not rely on cable for support.

L. Lugs shall be bolted to termination pads in equipment using corrosion resistant bolts,

nuts, and washers. Use Belleville washers for bolting aluminum to aluminum, and lock washers for bolting copper to copper or as recommended by equipment manufacturer. Torque to manufacturer's recommendations.

3.4 FIREPROOFING OF MEDIUM VOLTAGE CABLES

A. Exposed cables in manholes, vaults, and cable trays shall be fireproofed. Additionally, cables shall be fireproofed in pull boxes, troughs, switchgear pull sections and pulling pits containing two or more sets of cable. Entire installation shall conform to manufacturer's recommendations.

B. Arc proofing material shall be Scotch #77 electrical arc and fireproofing tape or approved equal.

C. Install the fireproofing on the cables as follows:

D. Install tightly applied fireproofing tape, approximately 1/16 inch thick by 1-1/2 inches wide minimum, around each cable spirally in one half-lapped wrapping.

E. Install the tape with the coated side towards the cable and extend it not less than one inch into each duct.

F. Install random wrappings of Scotch #69 glass cloth tape around the installed fire proofing tape per manufacturer's instructions to prevent it from unraveling.

3.5 CABLE ACCEPTANCE TESTS

A. Acceptance tests will be performed by an independent Testing Consultant under separate contract with DFD. The Contractor shall coordinate the scheduling of the tests and provide labor and services necessary to allow the Testing Consultant to test each completed cable circuit. This includes opening and closing equipment, providing temporary light and power as needed, etc.

B. Acceptance tests will be performed on all cable after installation and prior to energization. All splices and terminations are to be completed and tested as part of the acceptance test.

C. In the event that test results are not satisfactory, the Contractor shall make repairs and replace components as necessary to correct faults. Following corrections, tests will be repeated to the extent required to prove the deficiencies are corrected.

3.6 CABLE IDENTIFICATION AND LABELING

A. Provide the following information on cable identification label:
   1. Main feeder circuit number
   2. To and From Data

B. Install cable labels on each conductor at each cable termination, each cable splice, in each manhole and in each pullbox. Additionally, at these locations, provide one inch (1") colored vinyl plastic electrical tape wrap identification, (Scotch 35 or approved equal) around each conductor and cable as follows:
   1. 15 KV individual conductor system

a. A - phase - one (1) red wrap
b. B - phase - two (2) red wraps with 1/2" space between wraps
c. C - phase - three (3) red wraps with 1/2" space between wraps

C. See paragraph above under SPLICES AND TERMINATIONS INSTALLATION for splice label requirements. This is in addition to identification labels.

D. During entire cable installation, phasing of conductors shall be maintained and identified. Where final connections to equipment are made, phasing shall be verified and proper phase rotation determined prior to connection.

3.7 CONSTRUCTION VERIFICATION

A. Contractor is responsible for utilizing the construction verification checklists supplied under specification Section 26 08 00 in accordance with the procedures defined for construction verification in Section 01 91 01 or 01 91 02.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide all labor, materials, equipment, and incidentals shown, specified, and required to furnish and install low-voltage conductors and cabling.
   2. Types of cabling required include:
      a. Insulated cable for installation in raceways.
      b. Cable for installation in cable trays.

B. Related Sections:
   1. Section 26 05 53, Identification for Electrical Systems.
   2. Section 31 00 05 Trenching and Earthwork

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. Standards referenced in this Section are:
   1. ANSI/NETA ATS, Acceptance Testing Specifications for Electrical Power Equipment and Systems.
   2. ASTM B3, Specification for Soft or Annealed Copper Wire.
   3. ASTM B8, Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft.
   4. ASTM D3485, Specification for Smooth-Wall Coilable Polyethylene (PE) Conduit (Duct) for Preassembled Wire and Cable.
   5. ASTM F2160, Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD).
   6. NEMA TC 7, Smooth Wall Coilable Electrical Polyethylene Conduit.
   7. UL 44, Thermoset-Insulated Wires and Cables.
   8. UL 1277, Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver wire and cable according to NEMA WC 26.

1.5 SUBMITTALS

A. Action Submittals. Submit the following:

1. Product Data:
   a. Low-Voltage Electrical Power Conductors and Cables – Product Data
      1) Manufacturer's literature, specifications, and engineering data for low voltage insulated cable proposed for use.
2. Shop Drawings (NOT USED)
3. Samples (NOT USED)
4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:
1. Certificates
   a. Low-Voltage Electrical Power Conductors and Cables –Certifications
      1) Certification by the manufacturer that the conductors and cables conform to the requirements of the drawings and specifications.
      2) Certification by the Contractor that the conductors and cables have been properly installed, adjusted, and tested.
2. Test and Evaluation Reports (NOT USED)
3. Manufacturers' Instructions (NOT USED)
4. Source Quality Control Submittals (NOT USED)
5. Field Quality Control Submittals
   a. Low-Voltage Electrical Power Conductors and Cables – Field Quality Control
      1) Written results of field insulation resistance tests.
6. Qualifications Statements (NOT USED)
7. Manufacturer Reports (NOT USED)
8. Sustainable Design Submittals (NOT USED)
9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. (NOT USED)
1. Operation and Maintenance Data (NOT USED)
2. Record Documentation (NOT USED)
3. Training Material (NOT USED)
4. Warranty Documentation (NOT USED)
5. Software (NOT USED)
6. Bonds (NOT USED)
7. Maintenance Contracts (NOT USED)
8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. (NOT USED)
1. Spare Parts (NOT USED)
2. Extra Stock Materials (NOT USED)
3. Tools (NOT USED)

1.6 QUALITY ASSURANCE

A. Items provided under this Section shall be listed or labeled by UL or other Nationally Recognized Testing Laboratory (NRTL).
1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code, Article 100.

B. Regulatory Requirements: Comply with the following:
   1. NEC Article 300, Wiring Methods.
   2. NEC Article 310, Conductors for General Wiring.
   3. National Electrical Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.

PART 2 PRODUCTS

2.1 MATERIALS

A. BUILDING WIRES AND CABLES
   1. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as required to meet application and NEC requirements.
   2. Wire and cable for 600 volts and below: Soft drawn, copper wire with 600 volt insulation.
      a. Conductors:
         1) Annealed, copper in accordance with ASTM B33.
         2) Stranding: Class B in accordance with ASTM B8.
      b. Insulations and Coverings:
         1) Rubber: Conform to NEMA WC 3.
         2) Thermoplastic: Conform to NEMA WC 5.
         3) Cross-Linked Polyethylene: Conform to NEMA WC 7.
         4) Ethylene Propylene Rubber: Conform to NEMA WC 8.
   3. Feeders and service conductors: Single conductor Type XHHW-2.
   4. Branch Circuits:
      a. Single Conductor Type THHN/THWN: Above ground and underfloor conduits.
      b. Single Conductor Type XHHW-2: Duct bank conduit.
      c. No. 12 AWG minimum size (unless otherwise noted) for branch circuit wiring, including motor circuits.
      d. Size 120 v branch circuits for length of run on following basis.
         1) 0 to 50 ft Run From Panelboard to first outlet: No. 12 AWG minimum.
         2) 51 to 100 ft Run: Increase one wire size, i.e., No. 12 AWG becomes No. 10 AWG.
         3) 101 to 150 ft Run: Increase two wire sizes, i.e., No. 12 AWG becomes No. 8 AWG.
         4) 151 ft and above: Wiring sized for 3% maximum voltage drop.
      e. For other branch circuits, voltage drop for branch circuits and feeder circuit combined shall not exceed requirements of the NEC 215.
   5. Control Circuits:
      a. Single conductor Type THHN/THWN: Above ground and underfloor conduits.
      b. No. 14 AWG stranded copper minimum size (unless otherwise noted).
      c. Multi-wire cable assembly: Duct bank conduits.
      d. UL listed for installation in cable trays in accordance with NEC Art. 318, Class I, Division 2 hazardous areas.
   6. Non-shielded Instrumentation, Graphic Indication, and Other Control Wiring Operating at Less Than 120 v: No. 14 AWG stranded copper except as otherwise indicated with same insulation as control circuits.

a. Single conductor Type THHW/THWN, above ground and underfloor conduits.
b. Multi-wire cable assembly: Duct bank conduits.

7. Shielded instrumentation wiring, above ground and underfloor conduits:
   a. PVC insulation, tinned copper (19 by 27) stranded, No. 16 AWG, twisted pair or triplet cabled with aluminum mylar shielding, stranded, tinned, No. 18 AWG copper drain wire, and overall black FR-PVC, 90^{o}C, 600 volt jacket.
   b. Multi-wire cable assembly: duct bank conduits.
8. Telephone Wire: (NOT USED)
9. Fire Pump Feeder: (NOT USED)
10. Multi-Wire Control and Instrumentation Cable Assemblies:
    a. Multi-conductor, color-coded cable with number and size of conductors indicated.
    b. Where spare conductors are not indicated provide 10% spare conductors. One pair minimum.
    c. Control and non-shielded instrumentation.
       1) Bare soft stranded No. 14 or 12 AWG copper in accordance with ASTM B3.
       2) Class B stranded in accordance with ASTM B8.
       3) Type THWN insulation also meeting requirements of NEMA WC-5 with armor-nylon in accordance with UL 83-THHN/THWN.
       4) Color coded or numbered in accordance with NEMA WC-5 Method I Table K-2.
       5) Cabled with suitable fillers.
       6) Overall black FR-PVC, 90°C, 600 volt sunlight resistant jacket.
       7) UL listed for installation in cable trays in accordance with NEC Art. 318, Class I, Division 2 hazardous areas and in accordance with NEC 340 and for direct burial.
    d. Shielded Instrumentation:
       1) Bare soft stranded No. 16 AWG copper in accordance with ASTM B3.
       2) Class B stranded tinned copper in accordance with ASTM B8.
       3) PVC with nylon armor insulation.
       4) Twisted pairs color coded in accordance with NEMA WC-5 Method I Table K-2, and numbered.
       5) Individual and overall aluminum mylar shields and seven strand tinned copper drain wires.
       6) Overall black FR-PVC 90°C 600 volt sunlight resistant jacket.
       7) UL listed for installation in cable trays in accordance with NEC 318, Class I, Division 2 hazardous areas in accordance with NEC 340 and for direct burial.
11. Fiber-optic cables:
    a. OM1 multimode fiber, riser rated, UV resistant, crush resistant patch cables, with compatible connectors

B. Cable Connectors, Solderless Type:
   1. For wire sizes No. 4 AWG and above, use either compression type or bolted type with silver-plated contact faces.
   2. For wire sizes up to and including No. 6 AWG, use compression type. Alarm and control wire shall be terminated using forked type connectors at terminal boards.
   3. For wire sizes No. 1/0 AWG and larger, use connectors with at least two cable

clamping elements or compression indents and provision for at least two carbon steel bolts with Belleville Washer Nut or approved equal bolts for joining to apparatus terminal.
4. Properly size connectors to fit fastening device and wire size. Connectors shall be rated for 75 degree C, 600 volts.

C. Cable Splices:
1. For wire sizes No. 8 AWG and larger, splices shall be made up with compression type copper splice fittings. Splices shall be taped and covered with materials recommended by cable manufacturer to provide insulation equal to that on conductors.
2. For wire sizes No. 10 AWG and smaller, splices may be made up with pre-insulated spring connectors.
3. For wet locations, splices shall be waterproof. Compression type splices shall be waterproofed by sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring thermosetting resin into mold that surrounds the joined conductor. Spring connector splices shall be waterproofed with sealant filler.
4. Splices shall be suitably sized for cable, rated 75 degrees C, and 600 volts.
5. Splices shall be in accordance with NEC and UL.

D. Wire and Cable Markers:
1. Provide wire and cable markers in accordance with Section 26 05 53, Identification for Electrical Systems.

2.2 SOURCE QUALITY CONTROL

A. Factory Tests:
1. Factory-test wire and cable in accordance with UL and/or NEMA standards.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install wires and cables as indicated, according to manufacturer's written instructions and NECA "Standard of Installation".

B. Identification:
1. Identify conductors in accordance with Section 26 05 53, Identification for Electrical Systems.
2. Identify power conductors by circuit number and phase at each terminal or splice location.
3. Identify control and status wiring using numeral tagging system.

C. Color-code cables as follows:
1. Colors for power:

System	Conductor	Color
All Systems	Equipment Grounding	Green
240/120 Volts Single-Phase, Three-Wire	Grounded Neutral One Hot Leg Other Hot Leg	White Black Red
208Y/120 Volts Three-Phase, Four-Wire	Grounded Neutral Phase A Phase B Phase C	White Black Red Blue
240/120 Volts Three-Phase, Four-Wire Delta, Center Tap Ground on Single-Phase	Grounded Neutral Phase A High (wild) Leg Phase C	White Black Orange Blue
480Y/277 Volts Three-Phase, Four-Wire	Grounded Neutral Phase A Phase B Phase C	Gray Brown Orange Yellow

2. Colors for control wire
   a. AC hot conductor: Black.
   b. AC neutral conductor: White.
   c. Grounding conductor: Green.
   d. AC control conductor, powered from within panel: Red.
   e. AC control conductor, powered from remote source: Yellow.
   f. DC (+) power conductor, discrete signal: Blue.
   g. DC (-) power conductor, discrete signal: White with Blue Tracer.
   h. DC control conductor, discrete signal: Blue.
   i. Twisted pair cable (+) signal conductor, analog signal: White or Clear.
   j. Twisted pair cable (-) signal conductor, analog signal: Black.
   k. Twisted pair power, analog signal: Red

D. Remove existing wire from raceway before pulling in new wire and cable.

E. Bending Radius: Limit to minimum of six times cable overall diameter.
Slack: Provide maximum slack at all terminal points.

F. Run wire and cable in conduit unless otherwise indicated on Drawings. Pull conductors into raceway simultaneously where more than 1 is being installed in same raceway.
   1. Use pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation.
   2. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
   3. Do not draw conductor into conduits until building is enclosed, watertight, and work causing cable damage has been completed.

G. Install cable supports for vertical feeders in accordance with NEC. Provide split wedge type which firmly clamps each individual cable and tightens due to cable weight.

H. For panelboards, cabinets, wireways, switches, and equipment assemblies, neatly form, train, and tie cables in individual circuits.

I. Seal cable and wire entering building from underground or exterior between wire and conduit, where cable exits conduit, with non-hardening approved compound.

J. Install wire and cables in separate raceway systems as follows:
   1. ac Control.
   2. dc control.
   3. Shielded instrumentation.
   4. Telephone cables.
   5. Network Cables.
   6. Fiber Optic Cables.
   7. Emergency system.
   8. Fire alarm system.
   9. As required by NEC.

K. Where control or instrumentation cables are run in underground conduit and ducts provide multi-wire cable assemblies.

L. Where power cables and instrument/signal cables enter and pass through same manhole, handhole, or distribution box, or steel barrier, separate raceways shall continue through box manhole or handhole to avoid magnetic interaction between power cables and instrumentation conductors. In manholes and handholes, provide Type C raceway outlet body with 3/16 in. holes drilled in bottom for drainage.

M. Do not run instrumentation cables into control cabinets or MCC unless cables are terminated in cabinet or MCC.

N. Wiring at Outlets: Install with at least 12 in. (300 mm) of slack conductor at each outlet.

O. Do not use device as pass through for conductors. Pigtail conductors to device.

P. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL 486A.

Q. Drawings do not designate number of conductors in conduit nor does location of branch circuits and switch legs indicated on Drawings designate location or routing. Route branch circuits and switch legs as dictated by construction and these Specifications.

R. Neutral conductors SHALL NOT be shared.

3.2 TERMINATIONS AND SPLICES

A. Terminate control, instrumentation, and communication cables on terminal strips in

separate terminal cabinets located near conduit entrances of buildings or as shown on Drawings.

B. Power Cable Splices (no splices in cables unless approved by Engineer):
   1. Provide continuous lengths of cable without splices in motor circuits and feeders unless otherwise noted. Splices may be installed in motor circuits and feeders with prior approval by ENGINEER.
   2. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.
   3. Use splice and tap connectors that are compatible with conductor material.
   4. Where pre-insulated spring connectors are used for equipment connections, tape connector to wire to prevent loosening under vibration.
   5. Each tap, joint or splice in conductors No. 8 AWG and larger shall be taped with two half-lap layers of vinyl plastic electrical tape and finish wrap of color coding tape where required by code.
   6. Cable splices shall be made only in manholes, handholes, wireways, distribution boxes, and junction boxes. Splices below grade, in manholes, handholes, and wet locations shall be waterproof.

C. Power Cable Terminations:
   1. Termination of wires with full compression type lugs installed with appropriate hand or hydraulic tool. Use proper dies to achieve the desired compression.
   2. For screw type terminal blocks, terminations for stranded conductors shall be made with T & B lock-on fork connector with insulated sleeves.
   3. Motor lead conductor terminations shall be made with a T & B or approved equal, full compression lug, full ring type, bolted, and taped as required. For connecting motor lead to service wiring fasten full ring lugs together with cadmium plated steel cap screws, and cover with a minimum of 2 layers 1/2 lap, 3M Scotch No. 33 tape; option: T & B "Motor Stub Splice Insulator".

3.3 CONTROL CIRCUITS

A. Control circuit home runs from same area for the same system returning to same panel, (e.g., LCP, DPC, etc.,) may be combined provided signal and voltage types are not mixed.

B. Following types of home runs shall not be combined with other types:
   1. 4-20 ma dc analog; Type 2 shielded cable.
   2. 24 vdc discrete (e.g., field or LCP powered dry contacts).

3.4 BRANCH CIRCUITS

A. Motor branch circuits and branch circuits for 3 phase circuits shall not be combined.

B. Branch circuits for single phase equipment devices from same panel may be combined. Derating of conductors within conduit is not allowed.

3.5 FEEDERS:

A. Extend feeders at full capacity from origin to termination.

B. Each conduit raceway shall contain only those conductors constituting single feeder circuit.

C. Where multiple raceways are used for single feeder, each raceway shall contain conductor of each phase and neutral if used.

D. Where feeder conductors run in parallel, conductors shall be of same length, material, circular-mil area, insulation type, and terminated in same manner.

E. Where parallel feeder conductors run in separate raceways, raceways shall have same physical characteristics.

F. On network systems, neutral shall be run with phase wires. Unbalanced neutral current shall not exceed normal or derated conductor capacity.

3.6 MOTORS AND EQUIPMENT WIRING

A. Provide motor circuits in accordance with diagrams and schedules on Drawings and code requirements, from source of supply to associated motor starter and starter to motor terminal box, including necessary and required intermediate connections.

B. Do not include associated control conductors in same conduit with power conductors.

C. Provide branch circuits to conform with NEC requirements and nameplate ratings. CONTRACTOR responsible for verification of ratings of motors and installing proper branch circuits.

3.7 FIELD QUALITY CONTROL

A. Site Tests:
   1. Test each electrical circuit after permanent cables are in place, to demonstrate that circuit and equipment are connected properly and will perform satisfactorily, free from improper grounds and short circuits.
   2. Individually test 600-volt cable mechanical connections after installation and before they are put in service, with calibrated torque wrench. Values shall be in accordance with manufacturer's recommendations.
   3. Individually test 600-volt cables for insulation resistance between phases and from each phase to ground. Test after cables are installed and before they are put in service, with Megger for one minute at voltage rating recommended by cable manufacturer or in accordance with ANSI/NETA ATS recommendations.
   4. Insulation resistance for each conductor shall not be less than value recommended by cable manufacturer. Cables not meeting recommended value or that fail when tested under full load conditions shall be replaced with a new cable for full length.
   5. Perform phase rotation test on all three-phase circuits.

3.8 CABLES (LOW VOLTAGE)

A. Inspect cables for physical damage and proper connection in accordance with single-line diagram.

B. Test cable mechanical connections to manufacturer's recommended values using calibrated torque wrench.

C. Check cable color coding with specifications and NEC standards.

D. Electrical Tests:
   1. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 1000 volts dc for 1 min.
   2. Perform continuity test to insure proper cable connection.

E. Test Values:
   1. Evaluation results by comparison with cables of same length and type. Investigate any value less than 50 mega-ohms.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install complete grounding for electrical systems, structures, and equipment.
   2. Plus the following special applications:
      a. Overhead cable trays grounding.
      b. Underground distribution grounding.
      c. Common ground bonding with lightning protection system
      d. Grounding of steel structural columns
      e. Grounding of unit substations, switchgear, and switchboards
      f. Grounding of standby generators, solar PV inverter and battery storage inverters.

B. Related Sections:
   1. 31 00 05 Trenching and Earthwork

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. Standards referenced in this Section are:
   1. ANSI/NETA ATS, Acceptance Testing Specifications for Electrical Power Equipment and Systems.
   2. ASTM B8, Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft.
   3. ASTM B 33, Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes.
   4. UL 467, Grounding and Bonding Equipment.
   5. National Fire Protection Association 70 (NFPA)
   6. National Fire Protection Association 780 (NFPA)

B. Regulatory Requirements
   1. National Fire Protection Association 70 (NFPA)
   2. National Fire Protection Association 780 (NFPA)

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association (NETA) or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
    a. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association (NETA) to supervise on-site testing specified in Part 3.
    b. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
    c. Comply with UL 467 for grounding and bonding materials and equipment.

1.5 SUBMITTALS

A. Action Submittals. Submit the following:
1. Product Data
    a. Grounding and Bonding for Electrical Systems - Product Data
        1) Manufacturer's technical information for grounding materials proposed for use
2. Shop Drawings
    a. Grounding and Bonding for Electrical Systems - Shop Drawings
        1) Include listing of grounding connector types identifying where each will be used.
        2) Include layouts of each structure's ground grid.
        3) Include test point construction details.
3. Samples (NOT USED)
4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:
1. Certificates
    a. Grounding and Bonding for Electrical Systems - Certificates
        1) Certificates for field testing agency, signed by Contractor, certifying that agency complies with requirements specified in Quality Assurance Section Above.
2. Test and Evaluation Reports (NOT USED)
3. Manufacturers' Instructions (NOT USED)
4. Source Quality Control Submittals (NOT USED)
5. Field Quality Control Submittals
    a. Grounding and Bonding for Electrical Systems – Testing Plans
        1) Ground resistance test procedures
    b. Grounding and Bonding for Electrical Systems - Field Quality Control
        1) Results of ground resistance tests at each test point.
6. Qualifications Statements (NOT USED)
7. Manufacturer Reports (NOT USED)
8. Sustainable Design Submittals (NOT USED)
9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. Submit the following:
1. Operation and Maintenance Data (NOT USED)

2. Record Documentation
   a. Grounding and Bonding for Electrical Systems - Record Documentation
3. Training Material (NOT USED)
4. Warranty Documentation (NOT USED)
5. Software (NOT USED)
6. Bonds (NOT USED)
7. Maintenance Contracts (NOT USED)
8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. (NOT USED)
1. Spare Parts (NOT USED)
2. Extra Stock Materials (NOT USED)
3. Tools (NOT USED)

PART 2 PRODUCTS

2.1 MATERIALS

A. Bare Ground Cable:
1. Material: Soft-drawn, bare copper stranded cable complying with ASTM B8. No. 4/0 AWG minimum size unless otherwise shown or indicated on the Drawings.

B. Conductors
1. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
2. Bare Copper Conductors:
   a. Solid Conductors: ASTM B 3.
   b. Stranded Conductors: ASTM B 8.
   c. Tinned Conductors: ASTM B 33.
   d. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
   e. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
   f. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
   g. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
3. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) in cross section, unless otherwise indicated; with insulators

C. Ground Rods:
1. Material: Copper-clad rigid steel rods, 3/4-inch diameter, ten feet long.

D. Grounding Connectors:
1. Products and Manufacturers: Provide one of the following:
   a. Pressure Connectors:
      1) O.Z./Gedney, Division of Emerson.
      2) Burndy Corporation.
      3) Erico Products, Incorporated.
   b. Welded Connections:
      1) Cadweld by Erico Products, Incorporated.

2) Therm-O-Weld by Burndy Corporation.

2. Material:
   a. Pressure connectors shall be copper or copper alloy castings, bolted pressure type, designed and fabricated specifically for items to be connected and assembled with Durium or silicone bronze bolts, nuts, and washers.
   b. Welded connections shall be by exothermic process utilizing molds, cartridges, and hardware designed specifically for connection to be made or Burndy irreversible crimp types recommended by kit manufacturer for materials being joined and installation conditions
   c. Pipe Connectors shall be clamp type, sized for pipe.

E. Ground Test Well
   1. Provide heavy-duty test well suitable for heavy-duty traffic.
   2. Diameter and Material: 12.75-inch outside diameter, Schedule 80 PVC.
   3. Depth: Two feet.
   4. Cover: Provide test well with cast iron cover marked, “Ground” with cast iron ring to support lid.

F. Ground system components shall comply with UL 467.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine conditions for the Work and notify Engineer in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 APPLICATIONS

A. Equipment Grounding Conductors: Comply with NEC Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.
   1. Install equipment grounding conductor with circuit conductors for items below in addition to those required by Code:
      a. Feeders and branch circuits.
      b. Lighting circuits.
      c. Receptacle circuits.
      d. Single-phase motor or appliance branch circuits.
      e. Three-phase motor or appliance branch circuits.
      f. Flexible raceway runs.
      g. Armored and metal-clad cable runs.
   2. Busway Supply Circuits: Install separate equipment grounding conductor from grounding bus in switchgear, switchboard, or distribution panel to equipment grounding-bar terminal on busway.
   3. Isolated Grounding-Receptacle Circuits: Install separate insulated equipment grounding conductor connected to receptacle grounding terminal. Isolate grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding-conductor terminal of applicable derived system or service, except as otherwise indicated.
   4. Isolated Equipment Enclosure Circuits: For designated equipment supplied by

branch circuit or feeder, isolate equipment enclosure from supply raceway with nonmetallic raceway fitting listed for purpose. Install fitting where raceway enters enclosure and install separate equipment grounding conductor. Isolate equipment grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding-conductor terminal of applicable derived system or service, except as otherwise indicated.

5. Nonmetallic Raceways: Install equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.
6. Air-Duct Equipment Circuits: Install equipment grounding conductor to duct-mounted electrical devices operating at 120 V and above, including air cleaners and heaters. Bond conductor to each unit and to air duct.
7. Water Heater, Heat-Tracing, and Antifrost Heater Circuits: Install separate equipment grounding conductor to each electric water heater, heat-tracing assembly, and antifrost heating cable. Bond conductor to heater units, piping, connected equipment, and components.

B. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding-electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
   1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on 1/4 by 2 by 12 in. (6 by 50 by 300 mm) grounding bus.
   2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

C. Separately Derived Systems: Where NEC requires grounding, ground according to NEC 250.20 (D) and NEC 250.30.

D. Metal Poles Supporting Outdoor Lighting Fixtures: Ground pole to grounding electrode in addition to separate equipment grounding conductor run with supply branch circuit.

E. Common Ground Bonding with Lightning Protection System: Bond electric power system ground directly to lightning protection system grounding conductor at closest point to electric service grounding electrode. Use bonding conductor sized same as system grounding conductor and install in conduit.

F. Piping Systems and Other Equipment: Comply with NEC Article 250 for bonding requirements.

G. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 4/0 AWG minimum.
   1. Bury at least 24 inches (600 mm) below grade.
   2. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank when indicated as part of duct-bank installation.
   3. Install metal warning tape 12” above conductor.

H. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

I. Grounding Bus: Install in electrical and communication equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Install bus on insulated spacers 1 inch (25 mm), minimum, from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.
   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to horizontal bus.

J. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Welded connectors or irreversible crimp, except at test wells and as otherwise indicated.
   3. Connections to Ground Rods at Test Wells: Bolted connectors.
   4. Connections to Structural Steel: Welded connectors.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Common Ground Bonding with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
   2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Division 26 Section 26 05 43, "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches (300 mm) deep, with cover.
   1. Test Wells: Install at least one test well for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through lengths of conduit less than 12 inches.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
   3. Use exothermic-welded connectors or irreversible crimp connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

F. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.

H. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

I. When performing exothermic weld to building steel, prepare surface to accept weld.

J. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each exterior wall steel column and rebar mat, extending around the perimeter of building.
   1. Install tinned-copper conductor not less than No. 4/0 AWG for ground ring and for taps to building steel.
   2. Bury ground ring not less than 24 inches (600 mm) from building foundation.

K. Weld all buried connections except for test points.

L. GROUNDING OVERHEAD LINES
   1. Comply with IEEE C2 grounding requirements.
   2. Install two (2) parallel ground rods if resistance to ground by a single, ground-rod electrode exceeds 25 ohms.
   3. Drive ground rods until tops are 12 inches (300 mm) below finished grade in undisturbed earth.
   4. Ground-Rod Connections: Install bolted connectors for underground connections and connections to rods.
   5. Lightning Arrester Grounding Conductors: Separate from other grounding conductors.
   6. Secondary Neutral and Transformer Enclosure: Interconnect and connect to grounding conductor.
   7. Protect grounding conductors running on surface of wood poles with molding extended from grade level up to and through communication service and transformer spaces.

M. GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS
   1. Comply with IEEE C2 grounding requirements.
   2. Grounding Manholes and Handholes: Install a driven ground rod through

manhole or handhole floor, close to wall, and set rod depth so 4 inches (100 mm) will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches (50 mm) above to 6 inches (150 mm) below concrete. Seal floor opening with waterproof, nonshrink grout.

3. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.
4. Pad-Mounted Transformers and Switches: Install four ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 4 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches (150 mm) from the foundation.

N. EQUIPMENT GROUNDING
1. Ground electrical equipment in compliance with Laws and Regulations and the Contract Documents.
2. Equipment grounding conductors shall be bare stranded copper cable of adequate size installed in metal conduit where required for mechanical protection. Ground conductors, pulled into conduits with non-grounded conductors, shall be insulated. Insulation shall be green.
3. Control panels grounding conductors shall be bare stranded copper cable of adequate size to ground grid from AC ground bus, and an insulated stranded copper cable of adequate size to ground grid from DC ground bus.
4. Connect ground conductors to conduit with copper clamps, straps, or with grounding bushings.
5. Connect to equipment by means of lug compressed on cable end. Bolt lug to equipment frame using holes or terminals provided on equipment specifically for grounding. Do not use hold-down bolts. Where grounding provisions are not included, drill suitable holes in locations recommended by equipment manufacturer or designated by Engineer.
6. Connect to motors by bolting directly to motor frames, not to soleplates or supporting structures.
7. Connect to service water piping by means of copper clamps. Use copper bonding jumpers on gasketed joints.
8. Scrape bolted surfaces clean and coat with conductive oxide-resistant compound.
9. Install insulated equipment grounding conductors with all feeders and branch circuits.
10. Air-Duct Equipment Circuits: NOT USED
11. Water Heater, Heat-Tracing, and Antifrost Heating Cables: NOT USED
12. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate

conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

13. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
14. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
    a. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.
    b. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
15. Metal and Wood Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

O. CORROSION INHIBITORS
1. When making grounding and bonding connections, apply a corrosion inhibitor to all contact surfaces. Use corrosion inhibitor appropriate for protecting a connection between the metals used after scraping bolted surfaces clean and coat with conductive oxide resistant compound.

3.4 GROUND FAULT SYSTEMS

A. Visual and Mechanical Inspection:
1. Inspect for physical damage and compliance with Drawings and Specifications.
2. Inspect neutral main bonding connection to ensure following.
    a. Zero sequence system grounded upstream of sensor.
    b. Ground strap systems grounded through sensing device.
    c. Ground connection made ahead of neutral disconnect link.
3. Inspect control power transformer to ensure adequate capacity for system.
4. Manual operate monitor panels (if present) for following:
    a. Trip test.
    b. No trip test.
    c. Non-automatic reset.
5. Record proper operation and test sequence.
6. Inspect zero sequence systems for symmetrical alignment of core balance transformers about current carrying conductors.
7. Verify ground fault device circuit nameplate identification by actuation observation.
8. Pickup and time delay settings shall be set in accordance with settings developed through coordination study and as approved by ENGINEER.

B. Electrical Tests:

1. Test in accordance with manufacturer's instructions.
2. Measure system neutral insulation resistance to ensure no shunt ground paths exist, neutral-ground disconnect link removed, neutral insulation resistance measured, and link replaced.
3. Relay pickup current shall be determined by primary injection at sensor and circuit interrupting device operated.
4. Relay timing shall be tested by injecting 150% and 300% of pickup current into sensor. Total trip time shall be electrically monitored.
5. System operation shall be tested at 55% rated voltage.
6. Zone interlock system shall be tested by simultaneous sensor current injective and monitoring blocking function.

C. Test Parameters:
1. System neutral insulation shall be minimum of 100 ohms, preferably 1 megohm or larger.
2. Relay pickup current shall be within 10% of device dial or fixed setting, and in no case greater than 1,200 amp.
3. Relay timing shall be in accordance with manufacturer's published time-current characteristic curves, but in no case longer than 1 sec.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal[, at ground test wells][, and at individual ground rods]. Make tests at ground rods before any conductors are connected.
   a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
   b. Perform tests by fall-of-potential method according to IEEE 81.

B. Report measured ground resistances that exceed the following values: ****NOTE: Check IEEE Standards.
1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm.
5. Substations and Pad-Mounted Equipment: 5 ohms.
6. Manhole Grounds: 10 ohms.

C. Testing Agency: Provide services of qualified independent testing agency to perform specified acceptance testing.

D. Testing: Upon completion of installation of ground-fault protection system and after electrical circuits have been energized, demonstrate capability and compliance with

requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.

E. Excessive Ground Resistance: Where resistance to ground exceeds specified values, notify ENGINEER promptly and include recommendations to reduce ground resistance and to accomplish recommended work.

F. Correct malfunctioning units at site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

G. Report: Prepare certified test reports, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

3.6 RESTORATION

1. Restore surface features, including vegetation, at areas disturbed by work of this Section.
2. Re-establish original grades, except as otherwise indicated.
3. Where sod has been removed, replace it as soon as possible after backfilling is completed.
4. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition.
5. Restored soil shall be compacted as required in 31 00 05 Trenching and Earthwork.
6. Include topsoil, fertilizer, lime, seeding, sodding, sprigging, and mulching as required in 32 92 00 Lawns and Grasses.
7. Maintain restored surfaces as required in Division 32 Paving Specifications.
8. Restore disturbed paving as required in Division 32 Paving Specifications.

END OF SECTION

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SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 Description

A. Scope:
1. Supports from building structure for electrical items by means of hangers, supports, anchors, sleeves, inserts, seals, and associated fastenings.
2. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install hangers and supports for electrical systems.
3. Area Classifications: Materials shall by suitable for the area classification(s) shown or indicated on the Drawings, and specified in Section 26 05 05, General Provisions for Electrical Systems.
4. Provide complete support system to comply with seismic requirements. The support system shall be reviewed by a structural engineer.

B. Related Sections:
1. Section 26 05 05, General Provisions for Electrical Systems.
2. Section 26 05 33, Raceways and Boxes for Electrical Systems.

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. Standards referenced in this section are:
1. ASTM A123/A123M, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM E84, Test Method for Surface Burning Characteristics of Building Materials

B. Regulatory Requirements:
1. National Electrical Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.

1.4 QUALITY ASSURANCE

A. Items provided under this section shall be listed and labeled by UL or other Nationally Recognized Testing laboratory (NRTL).
1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code, Article 100.

1.5 SUBMITTALS

A. Action Submittals. Submit the following:
   1. Product Data
      a. Hangers and Supports for Electrical Systems - Product Data
         1) Manufacturer's name, product designation, and catalog number of each material item proposed for use.
         2) Manufacturer's specifications including material, dimensional and weight data, and load capacity for each supporting system component proposed for use.
         3) Manufacturer's Instructions: manufacturer's installation instructions, including recommended tightening torque values for all nuts and bolts.
         4) Pictorial views and corresponding identifying text of each component proposed for installation.
   2. Shop Drawings
      a. Hangers and Supports for Electrical Systems - Shop Drawings
         1) Detailed installation drawings showing dimensions and compatibility with proposed layout.
   3. Samples (NOT USED)
   4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:
   1. Certificates
      a. Hangers and Supports for Electrical Systems - Certificates
         1) Submit certifications required under this Section.
   2. Test and Evaluation Reports (NOT USED)
   3. Manufacturers' Instructions (NOT USED)
   4. Source Quality Control Submittals (NOT USED)
   5. Field Quality Control Submittals (NOT USED)
   6. Qualifications Statements (NOT USED)
   7. Manufacturer Reports (NOT USED)
   8. Sustainable Design Submittals (NOT USED)
   9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. (NOT USED)
   1. Operation and Maintenance Data (NOT USED)
   2. Record Documentation (NOT USED)
   3. Training Material (NOT USED)
   4. Warranty Documentation (NOT USED)
   5. Software (NOT USED)
   6. Bonds (NOT USED)
   7. Maintenance Contracts (NOT USED)
   8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. (NOT USED)

   1. Spare Parts (NOT USED)
   2. Extra Stock Materials (NOT USED)
   3. Tools (NOT USED)

PART 2 PRODUCTS

2.1 MATERIALS

A. Strut, Fittings, and Accessories:
   1. General
      a. Unless otherwise shown or indicated, strut shall be 1-5/8 inches by 1-5/8 inches unless load permits use of 7/8 inches by 1-5/8 inches. Double struts shall be two pieces of the same strut, welded back-to-back at the factory.
      b. Attachment holes, when required, shall be factory-punched on hole centers approximately equal to the cross-sectional width and shall be 9/16-inch diameter.
      c. Fittings, braces, brackets, hardware, and accessories shall be Type 316 stainless steel.
      d. Strut nuts shall be spring captured Type 316 stainless steel.
      e. Square and round washers shall be Type 316 stainless steel.
   2. Strut materials shall be suitable for area classifications indicated in Section 26 05 05, General Provisions for Electrical Systems, and shown or indicated on the Drawings.
      a. Dusty Locations:
         1) Strut shall be 12-gauge carbon steel, hot-dip galvanized after fabrication, complying with ASTM A123/A123M.
      b. Wet Locations:
         1) Strut shall be 12-gauge aluminum (Alloy 6063-T6).
      c. Corrosive Locations:
         1) Strut shall be 12-gauge Type 316 stainless steel.

B. Hanger Rods:
   1. Material:
      a. Dry Locations: All-thread, zinc-coated
      b. Wet, Corrosive, or Hazardous Areas: Stainless steel.
   2. Size: Not less than 3/8-inch diameter, unless otherwise shown on the Drawings or specified.

C. Beam Clamps for Attaching Threaded Rods or Bolts to Beam Flanges for Hanging Struts or Conduit Hangers:
   1. Beam clamps shall be stainless steel equipped with stainless steel square-head set screw, and shall include threaded hole sized for attaching the all-thread rod or threaded bolt.

D. Recycled rubber conduit supports for electrical systems
   1. Dimensions: 6-inches wide by 4 inches tall by 30.8 inches long
   2. Steel frame: steel, strut galvanized per ASTM A653
   3. Attaching hardware: zinc-plated threaded rod, nuts, and attaching hardware per ASTM B633.
   4.

E. Miscellaneous Hardware:
   1. Bolts, screws, and washers shall be stainless steel.
   2. Hex Nuts: Shall be stainless steel
   3. Expansion Anchors: Stainless steel wedge or sleeve type.
   4. Toggle Bolts: All stainless steel springhead type.

F. Brackets: Fabricated of angles, channels, and other standard structural shapes.

Connect with welds and machine bolts to form rigid supports. Comply with Section 05 50 00.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine conditions under which the Work will be installed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. The equipment shall be seismically qualified per the requirements of the California Building Code.

B. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.

C. Provide hangers and supports for electrical systems with necessary channels, fittings, brackets, and related hardware for mounting and supporting materials and equipment. Provide anchor systems, concrete inserts, and associated hardware for proper support of electrical systems.

D. Install equipment and devices on hangers and supports as shown on the Drawings, as specified, and as required.

E. Install hangers and supports level, true, free of rack, and parallel and perpendicular to building walls and floors, so that the hangers and supports are installed in a neat, professional, workmanlike manner.

F. Holes in suspended ceilings for rods for hangers and supports and other equipment shall be provided adjacent to bars, where possible, to facilitate removal of ceiling panels.

G. Coordinate installation of hangers and supports with equipment, cabinets, consoles, panels, enclosures, boxes, conduit, cable tray, wireway, busway, cablebus, piping, ductwork, lighting fixtures, and other systems and equipment. Locate hangers and supports clear of interferences and access ways.

H. Mounting of Conduit:
   1. Provide space of not less than 1/4-inch between conduit surfaces and abutting or near surfaces except struts, cable trays, steel beams, and columns.
   2. Fasten conduit to struts, cable trays, steel beams, and columns using specified clamps and straps as shown, specified, and required.
   3. Devices shall be compatible with size of conduit and type of support. Following installation, size identification shall be visible and legible.
   4. Install conduit supports and fasteners in accordance with Section, 26 05 33.13, Rigid Conduits.
   5. If supporting conduit to precast hollow core ceilings, install anchors in

accordance with ceiling manufacturer.

I. Raceway Supports:
   1. Conform to manufacturer's recommendations for selection and installation of supports.
   2. Strength of each support shall be adequate to carry present and future load multiplied by safety factor of at least four. Where this determination results in safety allowance of less than 200 lbs, provide additional strength until there is minimum of 200 lbs safety allowance in strength of each support.
   3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
   4. Support parallel runs of horizontal raceways together on trapeze-type hangers.
   5. Support individual horizontal raceways by separate pipe hangers. Spring steel fasteners may be used in lieu of hangers only for 1 in. and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings only. For hanger rods with spring steel fasteners, use 1/4 in. dia or larger threaded steel. Use spring steel fasteners that are specifically designed for supporting single conduits or tubing.
   6. In vertical runs, arrange support so load produced by weight of raceway and enclosed conductors is carried entirely by conduit supports with no weight load on raceway terminals.

J. Supports for Cabinets, Consoles, Panels, Enclosures, and Boxes:
   1. Freestanding: Unless otherwise specified or shown on the Drawings, provide supports for floor-mounted equipment, cabinets, consoles, panels, enclosures, and boxes. Such supports shall be 3.5-inch high concrete equipment base with a 45 degree chamfered edge. Base shall extend two inches beyond outside dimensions of equipment on all sides.
   2. Wall-Mounted: Stainless steel
      a. Provide space not less than 1/4-inch between cabinets, consoles, panels, enclosures, and boxes and the surface on which each is mounted. Provide non-metallic or stainless steel spacers as required.
      b. Do not mount equipment, enclosures, panels, and boxes directly to beams or columns. Mount struts to beams or columns using beam clamps, and mount equipment, enclosures, panels, and boxes to the struts.
   3. Floor Stand Rack: Stainless steel
      a. Where equipment, cabinets, consoles, panels, enclosures, and boxes cannot be wall-mounted, provide an independent floor stand rack.
      b. Floor stand rack shall consist of struts, plates, brackets, connection fittings, braces, accessories, and hardware assembled in a rigid framework suitable for mounting of intended materials and equipment.
      c. Equip floor stand racks with brackets and bases for rigidly-mounting the framework to the ceiling or floor, as applicable; or equip floor stand racks with beam clamps, angle plates, washers, and bolts for fastening to beam flanges, as applicable.
      d. When equipment, cabinets, consoles, panels, enclosures, and boxes weigh more than 100 pounds:
         1) Main vertical supports of floor stand rack assemblies shall be back-to-back struts.

2) Bracing, clamping and anchoring of each floor stand rack shall be sufficient to ensure rigidity of the floor stand rack with the intended equipment, enclosures, conduit, cable tray, busway, cable bus, and wireway installed. Floor stand racks shall not be deflected more than 1/8-inch by a 100-pound force applied at any point on the floor stand rack in any direction.

K. Drilling into beams or columns is not allowed unless authorized by Engineer.

L. Tighten nuts and bolts to the manufacturer's recommended torque values.

M. Field Cutting:
1. Cut edges of strut and hanger rod shall have rounded corners, edges beveled, and burrs removed. If field cutting the strut is required, use clean, sharp, dedicated tools. Remove oil, shavings, burrs, and other residue of cuttings prior to installation.
2. Coatings: To prevent corrosion:
   a. Coat cut edges with zinc-rich paint. Provide protective end cap.
   b. Bitumatic paint shall be used for aluminum in concrete.

N. Miscellaneous Supports: Support miscellaneous electrical components as required to produce same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.

O. Fastening: Unless otherwise indicated, fasten electrical items and their supporting hardware securely to building structure, including but not limited to conduits,
raceways, cables, cable trays, busways, cabinets, panelboards, transformers, boxes, disconnect switches, and control components in accordance with following:
1. Fasten by means of wood screws or screw-type nails on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Threaded studs driven by powder charge and provided with lock washers and nuts may be used instead of expansion bolts and machine or wood screws. Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws.
2. Holes cut in concrete shall not cut main reinforcing bars. Fill holes that are not used.
3. Load applied to any fastener shall not exceed 25% of proof test load. Use vibration- and shock- resistant fasteners for attachments to concrete slabs.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
1. Contractor shall provide all labor, materials, equipment, and incidentals shown, specified, and required to furnish and install conduit and fittings to form complete, coordinated and grounded raceway systems.
2. When specific, detailed conduit routings for various systems within buildings and other areas are not be shown on the Drawings, Contractor shall establish routings based on single-line, riser, and interconnection diagrams and other information on the Drawings. Contractor shall provide for the proper installation of conduits in each system.
3. Conduit types and the installation methods shall comply with the following, unless otherwise shown or indicated in the Contract Documents:
   a. Use rigid aluminum conduit for exposed indoor conduit runs in non-corrosive areas.
   b. Use PVC-coated rigid steel for exposed exterior conduit runs in hazardous, wet, and corrosive locations.
   c. Use PVC-coated rigid steel or rigid aluminum conduit for exposed interior conduit runs in hazardous, wet, and corrosive locations.
   d. Use PVC-coated rigid steel conduit for individual conduits direct-buried in the ground.
   e. Use Schedule 40 PVC conduit for concrete-encased duct bank runs.
   f. Use PVC coated rigid steel conduit for transition from duct bank.
   g. Use Schedule 40 PVC conduit for conduit runs embedded in structural concrete slabs. Use PVC coated rigid steel conduit for transition from duct bank.

B. Coordination:
1. Conduit runs shown are diagrammatic. Coordinate conduit installation with piping, ductwork, light fixtures, and other systems and equipment and locate to avoid interferences.
2. For conduits to be embedded in concrete slabs, confirm adequate slab thickness and coordinate location of conduits with placement of reinforcing steel, waterstops, expansion joints, and other features of the concrete slab.

C. Related Sections:
1. Section 26 05 05, General Provisions for Electrical Systems.
2. Section 26 05 29, Hangers and Supports for Electrical Systems.
3. Section 26 05 53, Identification for Electrical Systems.
4. Section 31 00 05 Trenching and Earthwork
5. Section 32 12 16, Asphalt Paving.

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. Standards referenced in this Section are:
   1. AASHTO, Standard Specifications for Highway Bridges.
   2. ANSI C80.1, Standard for Rigid Electrical Steel Conduit (ERSC).
   3. ANSI/NEMA FB1, Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable.
   4. NEMA TC3, Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.
   5. UL 514B, Conduit, Tubing, and Cable Fittings.
   6. UL 886, Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations.

B. Regulatory Requirements: Comply with the following:
   1. National Electrical Code: Components and installation shall comply with NFPA 70.
   2. NEC Article 344, Rigid Metal Conduit.
   3. NEC Article 350, Liquid-Tight Flexible Metal Conduit.
   4. NEC Article 352, Rigid Nonmetallic Conduit.
   5. NEC Article 358, Electrical Metallic Tubing.

C. Items provided under this section shall be listed or labeled by UL or other Nationally Recognized Testing Laboratory (NRTL).
   1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
   2. Terms "listed" and "labeled" shall be as defined in National Electrical Code, Article 100.

D. Comply with NECA "Standard of Installation."

1.4 SUBMITTALS

A. Action Submittals. Submit the following:
   1. Product Data
      a. Raceways and Boxes – Product Data
         1) Manufacturer's catalog cuts and product data for conduit, fittings, and appurtenances.
   2. Shop Drawings
      a. Raceways and Boxes – Assembly Details
         1) Assembly details of conduit racks and other conduit support systems.
      b. Raceways and Boxes – Layout Drawings
         1) Showing proposed routing of exposed conduits, conduits embedded in structural concrete, and conduits directly buried in the ground.
         2) Show locations of pull and junction boxes and penetrations in walls and floors.
         3) Shop Drawings of embedded conduits shall include cross-sections showing thickness of concrete slabs and locations of conduits relative to reinforcing steel, waterstops, and other features of the slab.

3. Samples (NOT USED)

4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:
   1. Certificates (NOT USED)
   2. Test and Evaluation Reports (NOT USED)
   3. Manufacturers' Instructions
      a. Raceways and Boxes – Manufacturers' Instructions
         1) When requested by Engineer, provide copies of manufacturer's recommendations for handling and installing products.
   4. Source Quality Control Submittals (NOT USED)
   5. Field Quality Control Submittals
      a. Raceways and Boxes – Field Quality Control
         1) When requested by Engineer, provide copies of results of specified field quality control testing.
   6. Qualifications Statements (NOT USED)
   7. Manufacturer Reports (NOT USED)
   8. Sustainable Design Submittals (NOT USED)
   9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. Submit the following:
   1. Operation and Maintenance Data (NOT USED)
   2. Record Documentation
      a. Raceways and Boxes – Record Drawings
         1) Show actual routing of exposed and concealed conduit runs in record documents in accordance with Section 01 78 39, Project Record Documents.
   3. Training Material (NOT USED)
   4. Warranty Documentation (NOT USED)
   5. Software (NOT USED)
   6. Bonds (NOT USED)
   7. Maintenance Contracts (NOT USED)
   8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. (NOT USED)
   1. Spare Parts (NOT USED)
   2. Extra Stock Materials (NOT USED)
   3. Tools (NOT USED)

PART 2 PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit, Elbows, and Couplings:
   1. Material: Rigid, heavy-wall, mild steel, hot-dip galvanized, smooth interior, tapered threads and carefully reamed ends; 3/4-inch NPS minimum size.
   2. Galvanized Rigid Steel Conduit: ANSI C80.1.

B. PVC-coated Rigid Steel Conduit, Elbows, and Couplings:

1. Manufacturers: Provide products of one of the following:
   a. Robroy Industries.
   b. No “Or Equal”
2. Material: Rigid, heavy-wall, mild steel, hot-dip galvanized, smooth urethane interior coating, tapered threads, carefully reamed ends, 3/4-inch NPS minimum size with factory exterior coating of 40-mil thick PVC.
3. Color: Color of coating shall be the same on all conduit and fittings.
4. Plastic-Coated Steel Conduit and Fittings: NEMA RN 1.

C. Aluminum Conduit, Elbows, and Couplings:
1. Material: Rigid, heavy-wall aluminum, smooth interior, tapered threads and carefully reamed ends; 3/4-inch NPS minimum size.
2. Rigid Aluminum Conduit: ANSI C80.5.

D. IMC – intermediate conduit shall not be used.

2.2 METALLIC FITTINGS

A. Metallic Conduit Fittings, and Outlet Bodies:
1. Material and Construction: Cast gray iron alloy, cast malleable iron or aluminum bodies and covers consistent with conduit material. Units shall be threaded type with five full threads. Materials shall comply with ANSI/NEMA FB1 and be listed by UL. Do not use “LB” fittings. Use type “LBD” fittings where use of fittings is unavoidable.
2. Use: Conduits shall be gasketed and watertight in hazardous, wet, and corrosive locations.
3. The use of threadless couplings and connectors is prohibited.

B. PVC-coated Conduit Fittings, and Outlet Bodies:
1. Material and Construction: Cast gray iron alloy, cast malleable iron bodies and covers with factory coating of 40-mil thick PVC and smooth urethane interior coating. Units shall be threaded type with five full threads. Material shall comply with ANSI/NEMA FB1 and be listed by UL. Do not use “LB” fittings. Use type “LBD” fittings where use of fittings is unavoidable.
2. Use: Provide PVC-coated or aluminum conduit fittings and outlet bodies in hazardous, wet, and corrosive locations. Fitting material shall be consistent with conduit material.

C. Conduit Hubs:
1. Material: Threaded conduit hub, vibration-proof, weatherproof, with captive O-ring seal, zinc metal with insulated throat and bonding screw.
2. Use: Provide for all conduit terminations to boxes, cabinets, and other enclosures in areas designated as wet locations.

D. PVC-coated Conduit Hubs:
1. Manufacturers: Provide products one of the following:
   a. Robroy Industries.
   b. No “Or Equal”
2. Material: Threaded conduit hub, vibration-proof, weatherproof, with captive O-ring seal, zinc metal with insulated throat and bonding screw, and factory coating of 40-mil thick PVC and smooth urethane interior coating.
3. Use: Provide for PVC-coated steel or aluminum conduit terminations to boxes,

cabinets, and other enclosures in areas designated as corrosive location.

E. Conduit Bushings and Locknuts:
1. Insulated Bushings: Malleable iron body with plastic liner. Threaded type with steel clamping screw. Provide with bronze grounding lug, as required.
2. Locknuts: Steel for sizes 3/4-inch through two-inch diameter and malleable iron for sizes 2.5-inch through four-inch diameter.
3. Use: Provide for all conduit terminations to boxes, cabinets and other enclosures except threaded type in areas designated as dusty locations.

F. Thru-wall Seals
1. For new construction through exterior subsurface walls and exterior concrete walls.
2. For new construction passing through concrete floors and floor slabs.
3. For conduits passing through new exterior masonry block walls or through core-drilled holes in existing exterior subsurface walls, exterior concrete walls, floor slabs ,and roof slabs, and for conduits passing through existing interior concrete walls or floors and interior masonry block walls.
a. Manufacturer: Provide one of the following:
1) Type CSMI sealing bushing at the inside of the structure and Type CSMC sealing bushing at the outside of the structure by O-Z/Gedney.
2) Or equal.

2.3 NONMETALLIC CONDUIT AND FITTINGS

A. Non-metallic Conduit and Fittings: Nonmetallic Conduit
1. Rigid Nonmetallic Polyvinyl Chloride (PVC) Conduit:
a. NEMA TC 2, Schedule 40 or 80 PVC. Rated for 90 degrees C, complying with UL 514B and 651.
b. Elbows and Fittings shall comply with NEMA TC3
c. Match conduit to type of material
d. Fittings: Form elbows, bodies, terminations, expansions, and fasteners of same material and manufacturer as base conduit. Provide cement by same manufacturer as base conduit.

2.4 FLEXIBLE CONDUIT

A. Flexible Conduit (Non-hazardous Areas and Class 1, Division 2, Hazardous Areas):
1. Material: Flexible galvanized steel core with smooth, abrasion-resistant, liquid-tight, polyvinyl chloride cover. Continuous copper ground built in for sizes 3/4-inch through 1.25-inch. Material shall be UL-listed.

B. Flexible Conduit (Class 1, Group D, Division 1, Hazardous Areas):
1. Material: Flexible brass inner core with bronze outer braid and protective neoprene plastic coating. Steel, brass, or bronze end fittings. Minimum of 12 inches long.

C. Flexible Metal Conduit: Zinc-coated steel.

D. Liquid-tight Flexible Metal Conduit: Flexible steel conduit with PVC jacket.

2.5 FLEXIBLE CONDUIT FITTINGS:

A. Metallic Flexible conduit fittings
   1. Material and Construction:
      a. Malleable iron with cadmium finish. Fittings shall adapt the conduit to standard threaded connections, shall have an inside diameter not less than that of the corresponding standard conduit size and shall be UL listed.
      b. Conduit fittings shall be insulated throat type. Conduit shall be liquid-tight with one piece sealing "O" rings with connectors when entering boxes or enclosures
   2. Use: Provide on flexible conduit in non-hazardous and Class 1, Division 2 hazardous areas.

B. PVC-Coated Flexible Conduit Fittings:
   1. Material and Construction:
      a. Malleable iron with standard finish and 40-mil PVC exterior coating. Fittings shall adapt the conduit to standard threaded connections and shall have an inside diameter not less than that of the corresponding standard conduit size.
      b. Conduit fittings shall be insulated throat type. Conduit shall be liquid tight with one piece sealing "O" rings with connectors when entering boxes or enclosures

2.6 WIREWAYS

A. Material: Sheet metal sized and shaped as indicated.

B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireway as required for complete system.

C. Select features where not otherwise indicated, as required to complete wiring system and to comply with NEC.

D. Wireway Covers:
   1. Hinged type for dry locations.
   2. Bolted cover with gasket for wet locations.

E. Finish: Manufacturer's standard enamel finish unless other wise noted.

2.7 PULL JUNCTION, AND TERMINAL BOXES:

A. General – Applicable to All Boxes:
   1. Description and Performance Criteria:
      a. Boxes shall be appropriate for each location in accordance with NEMA requirements and as required for area classifications specified in Section 26 05 05, General Provisions for Electrical Systems.
      b. For flush-mounted pullboxes in slabs or pavement potentially subject to vehicular traffic, boxes and covers shall be constructed for H-20 loading in accordance with AASHTO Standard Specifications for Highway Bridges.
   2. Materials: Pull boxes embedded in concrete slabs shall be polymer concrete.
   3. Terminal strips and terminal blocks in terminal boxes shall be mounted on

terminal box sub-panels.
4. Identification: Boxes shall be identified in accordance with Section 26 05 53, Identification for Electrical Systems.

B. Materials and Construction – Dusty Locations:
1. Material: NEMA 12 or fiberglass.
2. Gasket: Oil-resistant gasket.
3. Access: Lift-off hinges and quick-release latches.

C. Materials and Construction - Wet, Corrosive, or Hazardous Locations:
1. Material:
a. Pull boxes in wet, corrosive, or outdoor areas shall be NEMA 4X stainless steel.
b. Boxes for areas classified as hazardous locations, where required by NEC, shall be NEMA 7 explosion-proof and comply with UL 886.
c. In corrosive locations, where the conduit system is PVC-coated, boxes shall be cast metal with factory-applied 40-mil PVC coating, Type 316 stainless steel, or non-metallic thermoplastic or fiberglass reinforced plastic material.
2. Gasket:
a. Provide neoprene gaskets for wet and corrosive locations.
b. Gaskets shall be an approved type designed for the purpose. Improvised gaskets are not acceptable.
3. Access: Stainless steel cover bolts.
4. Features:
a. External mounting lugs.
b. Drilled and tapped conduit holes.
c. Boxes where conduits enter building or structure below grade shall have 1/4-inch drain hole at bottom of the box.
d. Provide threaded connections for explosion proof boxes.

D. Terminal Blocks:
1. Material and Construction:
a. NEMA-rated nylon modular terminal blocks.
b. 600-volt rated.
c. Terminals shall be screwed type with permanently affixed numeric identifiers beside each connection.
d. Power terminals shall be copper and rated for the circuit ampacity.

2.8 ACCESSORIES

A. Fasteners: To the extent possible, fastener material shall be consistent with conduit material. For PVC-coated rigid steel conduit runs, fasteners shall have factory applied PVC coating or be stainless steel. Fasten raceway systems to supporting structures using the following:
1. To Wood: Stainless steel screws
2. To Hollow Masonry Units: Toggle bolts and/or hollow wall anchors shall be stainless steel.
3. To Brick Masonry: Expansion bolts by Price, or equal shall be stainless steel.
4. To Concrete: Anchors shall be expansion anchors shall be stainless steel.
5. To Steel: Beam clamps in accordance with Section 26 05 29, Hangers and Supports for Electrical Systems which shall be stainless steel.

B. Duct Sealing Compound
   1. Soft, fibrous, slightly tacky, non-hardening sealing compound.
   2. Remains workable at all temperatures.
   3. Compound shall not slump at temperature of 300°F and shall readily adhere to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

C. Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit passing through concrete floors, walls, or boxes. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.

D. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers.

E. Pipe Sleeves: Provide pipe sleeves of one of following:
   1. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from following gauge metal for sleeve diameter noted:
      a. 3 in. and smaller: 20 ga.
      b. 4 in. to 6 in.: 16 ga.
      c. Over 6 in.: 14 ga.
   2. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe.
   3. Plastic Pipe: Fabricate from Schedule 80 PVC plastic pipe.

2.9 FIRE RESISTANT JOINT SEALERS

A. Two-part, foamed-in-place, silicone sealant formulated for use in through-penetration fire-stopping around cables, conduit, pipes, and duct penetrations through fire-rated walls and floors.

B. Sealants and accessories shall have fire-resistance ratings indicated, as established by testing identical assemblies in accordance with ASTM E 814, by Underwriters' Laboratories, Inc., or other testing and inspection agency acceptable to authorities having jurisdiction.

2.10 IDENTIFICATION

A. Conduit Labels:
   1. Provide conduit labels in accordance with Section 26 05 53, Identification for Electrical Systems.

B. Warning Tape:
   1. Provide warning tape in accordance with Section 26 05 53, Identification for Electrical Systems.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine conditions under which the Work will be performed and notify Engineer in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Supports:
   1. Rigidly support conduits by clamps, hangers, or Unistrut-type channels. Conduit supports and accessories shall be in accordance with Section 26 05 29, Hangers and Supports for Electrical Systems.
   2. Support single conduits by means of one-hole pipe clamps in combination with one-screw back plates, to raise conduits from the support surface. Support multiple runs of conduits on trapeze type hangers.

B. Fastenings: Fasten raceway systems rigidly and neatly to supporting structures using specified materials. Follow NEC for support spacing.

C. Exposed Conduit:
   1. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members and follow surface contours as much as practical.
      a. Mount exposed horizontal runs as high above floor as possible, and in no case lower than 7 ft above floors, walkways, or platforms in passage areas.
      b. Run parallel or banked raceways together, on common supports where practical.
      c. Make bends in parallel or banked runs from same center line to make bends parallel. Use factory elbows only where they can be installed parallel; otherwise, provide field bends for parallel raceways.
   2. Where possible, run in groups. Provide conduit racks of suitable width, length, and height, arranged to suit field conditions. Provide support every ten feet, minimum.
   3. Install on structural members in protected locations.
   4. Locate clear of interferences.
   5. Provide six inches of clearance from hot fluid lines and 1/4-inch from walls.
   6. Install vertical runs plumb. Unsecured drop length shall not exceed 12 feet.
   7. Use temporary closures to prevent foreign matter from entering raceway.

D. Underground Conduits:
   1. Install individual, underground conduits minimum of 36 inches below grade, unless otherwise shown or indicated.
   2. Perform excavation, bedding, backfilling, and surface restoration, including pavement replacement where required, in accordance with Section 31 00 05 Trenching and Earthwork, and Section 32 16 00, Asphalt Paving.
   3. Install traceable warning tape 12 inches below finished grade over buried conduits.
   4. Installation shall be in accordance with requirements of section 26 05 43 Underground Ducts and Raceways for Electrical Systems

E. Empty Conduits:
   1. Install nylon pull wire in each empty conduit and cap conduits not terminating in boxes with permanent fittings designed for the purpose.

2. Install two spare 1 in. conduits from top of each flush mounted panelboard to area above ceiling for future use. On flush mounted panelboards located on first and higher level floors, provide two spare 1 in. conduits from bottom of panelboard to ceiling area of floor below for future use.

F. Field Bends: No indentations. Diameter of conduit shall not vary more than 15 percent at bends.

G. Joints:
1. Apply conductive compound to joints before assembly.
2. Make up joints tight and ground thoroughly.
3. Use standard tapered pipe threads for conduit and fittings.
4. Cut conduit ends square and ream to prevent damaging wire and cable.
5. Use full threaded couplings. Split couplings are not allowed.
6. Use strap wrenches and vises to install conduit. Replace conduit with wrench marks.
7. Apply zinc-rich paint to exposed threads and other areas of galvanized conduit system where base metal is exposed.

H. Terminations:
1. Install insulated bushings on conduits entering boxes or cabinets, except when threaded hubs are used.
2. Provide locknuts on both inside and outside of enclosure, except when threaded hubs are used.
3. Use of bushings in lieu of locknuts is not allowed.
4. Install conduit hubs on conduits entering boxes or cabinets in wet and corrosive areas.

I. Moisture Protection:
1. Plug or cap conduit ends at time of installation to prevent entrance of moisture and foreign materials.
2. Underground and embedded conduit connections shall be watertight.
3. Thruwall Seals and Conduit Sealing Bushings: Install for conduits passing through concrete slabs, floors, walls, or concrete block walls.
4. Drainage: Conduit runs shall be fully drainable. Where possible install conduit runs to drain to one end and away from building. Avoid pockets or depressions in conduit runs.
5. Seal conduit openings within control and instrumentation panels and distribution equipment with duct sealing compound to provide watertight seal.
6. Use threaded hubs when entering top of enclosures.
7. Use sealing type locknuts when entering sides or bottom of enclosures.

J. Corrosion Protection:
1. Dissimilar Metals:
   a. Prevent occurrence of electrolytic action between dissimilar metals.
   b. Do not use copper products in connection with aluminum, and do not use aluminum in locations subject to drainage of copper compounds on bare aluminum.
   c. Protect Aluminum conduit where in contact with concrete.

K. Core drill for individual conduits passing through existing concrete slabs and walls. Notify Engineer in writing in advance of core drilling. Prior to core drilling, drill

sufficient number of small exploratory holes to establish that the area to be core drilled is free of existing embedded conduits. Seal spaces around conduit meeting moisture protection requirements of this section.

L. Non-metallic Conduit:
   1. Install in accordance with manufacturer's recommendations.
   2. Provide manufacturer's recommended adhesives or sealants for watertight connections.
   3. Provide expansion fittings for expansion and contraction to compensate for temperature variations. Fittings shall be watertight and suitable for direct burial.
   4. Use PVC coated rigid steel elbows in concrete encasements and duct banks.
   5. Transition to PVC-coated rigid steel conduit before making turn up to enclosures.

M. PVC-coated Rigid Steel Conduit:
   1. Install in accordance with manufacturer's recommendations.
   2. Install with manufacturer's installation tools to avoid damage to PVC coating.
   3. Repair damaged PVC coating with manufacturer's recommended touch-up compound.
   4. Use only manufacturer approved threading equipment and tools

N. Telephone and Signal System Raceways 2 in. Trade Size and Smaller: In addition to above requirements, install in maximum lengths of 150 ft (45 m) and with maximum of two 90° bends or equivalent. Install pull or junction boxes where necessary to comply with these requirements.

O. Conduit bends
   1. Make bends and offsets so inside diameter is not reduced. Unless otherwise indicated, keep legs of bend in same plane and straight legs of offsets parallel.
   2. Provide NEMA standard conduit bends, except for conduits containing medium voltage cable, fiber optic cable, or conductors requiring large radius bends.
   3. Provide large radius conduit bends for conduits containing 5 kV and 15 kV cables as follows:

Conduit Trade	Bend Radius
2 in. - 2-1/2 in.	36 in.
3 in. - 4 in.	48 in.
5 in.	48 in.

   4. Where physical limitations do not permit use of above, conduit bends with radius of at 8 times diameter of largest cable passing through conduit may be used.

P. Identify conduits, including spares, in accordance with Section 26 05 53, Identification for Electrical Systems.

Q. Vertical Conductor Supports: Install simultaneously with installation of conductors.

R. Sleeves: Install in concrete slabs and walls and other fire-rated floors and walls for raceways and cable installations. For sleeves through fire rated-wall or floor

construction, apply UL listed firestopping sealant in gaps between sleeves and enclosed conduits and cables.

S. Conduit Seals: Install seals for conduit penetrations of slabs below grade and exterior walls below grade and where indicated. Tighten sleeve seal screws until sealing grommets have expanded to form watertight seal.

T. Conduit extending through roof shall be sealed and integrated into the roofing system and made water tight.

3.3 FLEXIBLE CONDUIT INSTALLATION

A. Use maximum of 6 ft (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures.

B. Install at motors, transformers, field instruments, and equipment subject to vibration or require movement for maintenance purposes. Provide necessary reducer where equipment furnished cannot accept 3/4 inch diameter flexible conduit. Limit flexible conduit length to three feet maximum.

C. Use liquid tight flexible conduit in wet or damp locations.

D. Use approved flexible connections in hazardous locations.

E. Install separate ground conductor inside flexible conduit connections.

3.4 PULL JUNCTION AND TERMINAL BOXES INSTALLATION

A. Mount boxes so that sufficient access and working space is provided and maintain clearance of not less than 1/4-inch from walls.

B. Securely fasten boxes to walls or other structural surfaces on which boxes are mounted. Provide independent supports that comply with Section 26 05 29, Hangers and Supports for Electrical Systems, where boxes will not be mounted on walls or other structural surface.

C. Install pull boxes where shown or indicated, and provide pull boxes where one or more of the following conditions exist:
   1. Conduit runs containing more than three 90-degree bends.
   2. Conduit runs exceeding 200 feet in length.

D. Provide removable, flame-retardant, insulating cable supports in boxes with any dimension exceeding three feet.

E. Field-apply PVC touch-up to scratched PVC boxes damaged during installation. Touch-up work shall be in accordance with manufacturer's recommendations and instructions.

F. Size junction, pull, and terminal boxes in accordance with NEC Article 314 and other Laws and Regulations.

G. Provide terminal blocks in boxes where shown and where cable terminations or

splices are required.

H. Do not locate boxes on handrails, unless directed by Engineer.

3.5 FITTINGS

A. Install raceway sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL-listed sealing compound. Install raceway sealing fittings at following points and elsewhere as indicated:
   1. Where conduits enter or leave hazardous locations.
   2. Where conduits pass from warm locations to cold locations, such as boundaries of refrigerated spaces and air-conditioned spaces.
   3. Where otherwise required by NEC.

B. Use raceway fittings compatible with raceway and suitable for use and location. For GRS use threaded galvanized rigid steel conduit fittings, except as otherwise indicated.

C. Install automatic breather drain fittings according to manufacturer's written instructions. Locate fittings to drain conduit system and prevent condensate from entering device enclosures. Install automatic breather drain fittings at following points and elsewhere as indicated.
   1. Where vertical seals are installed.
   2. Low points in conduit system.
   3. Below field instruments at junction of flexible and rigid conduit.
   4. Where otherwise required by NEC.

D. Install wall entrance seal as dictated by application where conduits pass through foundation walls below grade.

E. Install conduit expansion fittings complete with bonding jumper in following locations.
   1. Conduit runs crossing structural expansion joint.
   2. Conduit runs attached to 2 separate structures.
   3. Conduit runs where movement perpendicular to axis of conduit may be encountered.

F. Where conduit passes from inside of building to outdoors, it shall be firmly packed at fitting nearest wall line with Johns-Manville Duxseal to depth of at least 1 in. after wires and cables are pulled in; or, if conduit enters directly into equipment, it shall be fitted with seal and drain fitting to prevent water entering equipment.

3.6 GROUNDING

A. Ground in accordance with Section 26 05 26.

B. Provide grounding connections for raceway, boxes, and components as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals according to torques requirements specified in UL

486A.

3.7 PROTECTION

A. Provide final protection and maintain conditions, in manner acceptable to manufacturer and Installer, to ensure that coatings, finishes, and cabinets are without damage or deterioration at Substantial Completion.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC or paint finishes with matching touch-up coating recommended by manufacturer.

3.8 CLEANING

A. Upon completion of installation of system, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

3.9 FIELD QUALITY CONTROL

A. Site Tests:
   1. Test conduits by pulling through each conduit a cylindrical mandrel with length not less than two pipe inside diameters, having an outside diameter equal to 90 percent of conduit's inside diameter.
   2. Maintain a record, by number, of all conduits successfully tested.
   3. Repair or replace conduits that do not successfully pass testing, and re-test.

END OF SECTION

SECTION 26 05 36

CABLE TRAYS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
1. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, tests and services to install complete cable tray systems as shown on the drawings.
2. Cable tray systems are defined to include but are not limited to straight sections of ladder type cable trays, bends, tees, elbows, drop-outs, supports, and accessories.

B. Coordination:
1. Coordinate manhole, handhole, and underground ductbank installation with piping, sheeting other excavation supports, and other Underground Facilities, and locate clear of interferences.
2. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before manhole, handhole, and underground ductbanks for electrical systems Work.
3. Notify other contractors in advance of installing manholes, handholes, and underground ductbanks for electrical systems to provide other contractors with sufficient time for installing items included in their contracts that will be installed with or before manhole and handhole for electrical systems Work.
4. Coordinate locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Engineer.

C. Related Sections:
1. Section 03 20 00, Concrete Reinforcing.
2. Section 03 30 00, Cast in Place Concrete.
3. Section 26 05 26, Grounding and Bonding for Electrical Systems.
4. Section 26 05 53, Identification for Electrical Systems.
5. Section 26 05 33 Raceways and Boxes for Electrical Systems
6. Section 31 00 05, Trenching and Earthwork

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. Standards referenced in this Section are:
1. ANSI/NFPA 70 - National Electrical Code.
2. ASTM A123 - Specification for Zinc (Hot-Galvanized) Coatings on Products

Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip.
3. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
4. ASTM A1011 - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High Strength Low Alloy with Improved Formability *(Formerly ASTM A570 &A607)*
5. ASTM A1008 – Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability *(Formerly ASTM A611)*
6. ASTM B633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel
7. NEMA VE 1-2017 – Metallic Cable Tray Systems
8. NEMA VE 2-2018 – Cable Tray Installation Guidelines

1.4 FIELD CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
   1. Notify Engineer no fewer than fourteen (14) days in advance of proposed interruption of electrical service.
   2. Do not proceed with interruption of electrical service without Engineer's written permission.

1.5 DRAWINGS

A. The drawings, which constitute a part of these specifications, indicate the general route of the cable tray systems. Data presented on these drawings are as accurate as preliminary surveys and planning can determine until final equipment selection is made. Accuracy is not guaranteed and field verification, of all dimensions, routing, etc., is directed.

B. Specifications and drawings are for assistance and guidance, but exact routing, locations, distances and levels will be governed by actual field conditions. Contractor is directed to make field surveys as part of his work prior to submitting system layout drawings.

1.6 SUBMITTALS

A. Action Submittals. Submit the following:
   1. Product Data
      a. Underground Ducts and Raceways - Manufacturer's Technical Information
         1) Specifications, and literature for manholes, handholes, castings, and accessories proposed for use.
         2) Duct-Bank Materials - Include separators and miscellaneous components.
         3) Ducts and Conduits and Their Accessories - Include elbows, end bells, bends, fittings, and solvent cement.
         4) Warning Tape - Product information including markings and selected color.

2. Shop Drawings
   a. Layout of Manhole Electrical Systems

B. Informational Submittals. Submit the following:
   1. Certificates
      a. Underground Ducts and Raceways – Product Certificates
         1) Submit for concrete and steel used in precast concrete manholes and handholes, as required by ASTM C 858.

C. Closeout Submittals. Submit the following:
   1. Record Documentation
      a. Underground Ducts and Raceways – Record Drawings
         1) Include actual routing of underground ductbank runs on record documents in accordance with Section 01 78 39, Project Record Documents.

D. Maintenance Material Submittals. Submit the following.
   1. Extra Stock Materials
      a. Underground Ducts and Raceways – Extra Stock Materials
         1) Furnish cable-support stanchions, arms, insulators, and associated fasteners in quantities equal to ten (10) percent of quantity of each item installed.

1.7 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of cable trays and fittings of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. NEMA Compliance: Comply with NEMA Standards Publications Number VE1, “Cable Tray Systems”

C. NEC Compliance: Comply with NEC, as applicable to construction and installation of cable tray and cable channel systems (Article 318, NEC).

D. UL Compliance: Provide products that are UL-classified and labeled.

E. NFPA Compliance: Comply with NFPA 70B, "Recommended Practice for Electrical Equipment Maintenance" pertaining to installation of cable tray systems.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

B. Store precast concrete and/or other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

C. Lift and support precast concrete units only at designated lifting or supporting points.

D. Method of Delivery
   1. If deliver is by truck, Bidder shall specify the anticipated type of vehicle: box truck, van, flatbed, stake bed, semitrailer, etc.
   2. Bidder shall include information regarding special conditions such as over-sized dimensions or heavy axial loading.

E. Delivery Off-Loading
   1. Bidder shall describe the off-loading process at the point of delivery including equipment requirements such as, but not limited to, powered-lift gate, fork-lift, crane (lift hooks, slings, spreaders, etc.).
   2. Bidder shall include the time allowed for off-loading.

F. Installation
   1. Bidder shall provide a full description of installation and assembly services provided by Bidder, including manpower, and an inclusive list of trades to be provided by Purchaser to complete the installation and assembly process.

PART 2 PRODUCTS

2.1 CABLE TRAY SECTIONS AND COMPONENTS

A. General: Except as otherwise indicated, provide metal cable trays, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features.

B. Project design is based on aluminum cable ladder. Any deviations from this require approval in writing.

C. Materials and Finish: Material and finish specifications for each tray type are as follows:
   1. Aluminum: Straight section and fitting side rails and rungs shall be extruded from Aluminum Association Alloy 6063. All fabricated parts shall be made from Aluminum Association Alloy 5052.
   2. Pre-galvanized Steel: Straight sections, fitting side rails, rungs, and covers shall be made from steel meeting the minimum mechanical properties and mill galvanized in accordance with ASTM A653 SS, Grade 33, coating designation G90.
   3. Hot-dip Galvanized Steel: Straight section and fitting side rails and rungs shall be made from steel meeting the minimum mechanical properties of ASTM A1011 SS, Grade 33 for 14 gauge and heavier, ASTM A1008, Grade 33, Type 2 for 16 gauge and lighter, and shall be hot-dip galvanized after fabrication in accordance with ASTM A123. All covers and splice plates must also be hot-dip galvanized after fabrication; mill galvanized covers are not acceptable for hot-dipped galvanized cable tray. All hot-dip galvanized after fabrication steel cable trays must be returned to point of manufacture after coating for inspection and removal of all icicles and excess zinc. Failure to do so can cause damage to cables and/or injury to installers.
   4. Stainless Steel: Straight section and fitting side rails and rungs shall be made of AISI Type 304 or Type 316 stainless steel. Transverse members (rungs) or corrugated bottoms shall be welded to the side rails with Type 316 stainless steel

welding wire.

2.2 TYPE OF TRAY SYSTEM

A. Ladder type trays shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to the side rails. Rungs shall be spaced 9 inches on center. Spacing in radiused fittings shall be 9 inches and measured at the center of the tray's width. Rungs shall have a minimum cable-bearing surface of 7/8 inch with radiused edges. No portion of the rungs shall protrude below the bottom plane of the side rails. **Each rung must be capable of supporting the maximum cable load, with a safety factor of 1.5 and a 200 pound concentrated load when tested in accordance with NEMA VE-1, section 5.4.

B. Tray Sizes shall have 6 inch minimum usable load depth, or as noted on the drawing.

C. Straight tray sections shall have side rails fabricated as I-Beams. All straight sections shall be supplied in standard 24 foot lengths, except where shorter lengths are permitted to facilitate tray assembly lengths as shown on drawings.

D. Tray widths shall be as shown on drawings

E. All fittings must have a minimum radius of 24 inches

F. Splice plates shall be the bolted type made as indicated below for each tray type. The resistance of fixed splice connections between adjacent sections of tray shall not exceed .00033 ohms. Splice plate construction shall be such that a splice may be located anywhere within the support span without diminishing rated loading capacity of the cable tray. Splice plates shall be furnished with straight sections and fittings.
   1. Aluminum Tray - Splice plates shall be made of 6063-T6 aluminum, using four square neck carriage bolts and serrated flange locknuts. Hardware shall be zinc plated in accordance with ASTM B633, SC1. If aluminum cable tray is to be used outdoors then hardware shall be Type 316 stainless
   2. Steel (including Pre-galvanized and Hot-dip galvanized) - Splice plates shall be manufactured of high strength steel, meeting the minimum mechanical properties of ASTM A1011 HSLAS, Grade 50, Class 1. Each splice plate shall be attached with four ribbed neck carriage bolts with serrated flange locknuts. Hardware shall be zinc plated in accordance with ASTM B633 SC1 for pre-galvanized cable trays, or Chromium Zinc in accordance with ASTM F-1136-88 for hot-dip galvanized cable trays.

G. Cable Tray Supports: Shall be placed so that the support spans do not exceed maximum span as determined by manufacturer load study for the calculated load (refer to section 2.3 below) or otherwise indicated on drawings. Supports shall be constructed from 12 gauge steel formed shape channel members 1-5/8 inch by 1-5/8 inch with necessary hardware such as Trapeze Support Kits (9G-55XX-22SH) as manufactured by Cooper B-Line, Inc. or engineer approved equal. Cable trays installed adjacent to walls shall be supported on wall mounted brackets such as B409 as manufactured by Cooper B-Line, Inc. or engineer approved equal.

H. Center hung supports shall be manufactured of 12 gauge, 1-5/8 inch by 1-5/8 inch B-Line B22 steel strut with a pipe welded at the middle of the support to provide eccentric loading stability. Support shall withstand 700 pounds in a 60 percent vs. 40

percent eccentric loading condition with a safety factor of 3.

I. Trapeze hangers and center-hung supports shall be supported by 1/2 inch (minimum) diameter rods.

J. Barrier Strips: Shall be placed as specified on drawings and be fastened into the tray with self-drilling screws.

K. Accessories - special accessories shall be furnished as required to protect, support, and install a cable tray system. Accessories shall consist of but are not limited to; section splice plates, expansion plates, blind-end plates, specially designed ladder dropouts, barriers, etc.

2.3 LOADING CAPACITIES

A. Cable tray shall be capable of carrying a uniformly distributed load sufficient to support the equipment indicated on the drawings as determined by cable tray vendor. A safety factor of 1.5 shall be included when supported as a simple span and tested per NEMA VE1 Section 5.2.

B. Cable Tray Vendor shall submit load calculations and installation drawings approved by a professional engineer licensed in the Project state.

PART 3 EXECUTION

3.1 INSPECTION

A. Install cable trays as indicated: Installation shall be in accordance with equipment manufacturer's instructions, and with recognized industry practices to ensure that cable tray equipment comply with requirements of NEC and applicable portions of NFPA 70B. Reference NEMA-VE2 for general cable tray installation guidelines.

B. Coordinate cable tray with other electrical work as necessary to properly integrate installation of cable tray work with other work.

C. Provide sufficient space encompassing cable trays to permit access for installing and maintaining cables.

D. Cable tray fitting supports shall be located such that they meet the strength requirements of straight sections. Install fitting supports per NEMA VE-2 guidelines, or in accordance with manufacturer's instructions.

3.2 TESTING

A. Test cable trays to ensure electrical continuity of bonding and grounding connections, and to demonstrate compliance with specified maximum grounding resistance. See NFPA 70B, Chapter 18, for testing and test methods.

B. Manufacturer shall provide test reports witnessed by an independent testing laboratory of the "worst case" loading conditions outlined in this specification and

performed in accordance with the latest revision of NEMA VE-1; including test reports verifying rung load capacity in accordance with NEMA VE-1 Section 5.4.

END OF SECTION

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SECTION 26 05 43

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install manholes, handholes, and underground ductbanks for electrical systems Work.

B. Coordination:
   1. Coordinate manhole, handhole, and underground ductbank installation with piping, sheeting other excavation supports, and other Underground Facilities, and locate clear of interferences.
   2. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before manhole, handhole, and underground ductbanks for electrical systems Work.
   3. Coordinate locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Engineer.

C. Related Sections:
   1. Section 03 20 00, Concrete Reinforcing.
   2. Section 03 30 00, Cast in Place Concrete.
   3. Section 26 05 26, Grounding and Bonding for Electrical Systems.
   4. Section 26 05 53, Identification for Electrical Systems.
   5. Section 26 05 33 Raceways and Boxes for Electrical Systems
   6. Section 31 00 05, Trenching and Earthwork
   7. Section 31 20 00, Excavation

1.2 MEASUREMENT AND PAYMENT

A. This item is to be bid per linear foot according to the bid sheet, and not included in overall lump sum cost for section 26 electrical equipment & installation.

1.3 REFERENCES

A. Standards referenced in this Section are:
   1. AASHTO, Specifications for Highway Bridges.
   2. ANSI/SCTE 77, Specification for Underground Enclosure Integrity.
   3. ASTM A48/A48M, Specification for Gray Iron Castings.
   4. ASTM C478, Specification for Precast Reinforced Concrete Manhole Sections
   5. ASTM C 858, Specification for Underground Precast Concrete Utility Structures
   6. ASTM C 1037, Standard Practice for Inspection of Underground Precast Concrete Utility Structures

1.4 FIELD CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
   1. Notify Engineer no fewer than fourteen (14) days in advance of proposed interruption of electrical service.
   2. Do not proceed with interruption of electrical service without Engineer's written permission.

1.5 SUBMITTALS

A. Action Submittals. Submit the following:
   1. Product Data
      a. Underground Ducts and Raceways - Manufacturer's Technical Information
         1) Specifications, and literature for manholes, handholes, castings, and accessories proposed for use.
         2) Duct-Bank Materials - Include separators and miscellaneous components.
         3) Ducts and Conduits and Their Accessories - Include elbows, end bells, bends, fittings, and solvent cement.
         4) Warning Tape - Product information including markings and selected color.
   2. Shop Drawings
      a. Layout of Manhole Electrical Systems
         1) Where manholes have extensive electrical systems and supports for electrical systems, submit for each plans, sections, and details indicating proposed layout of such materials and equipment in each manhole.
         2) Shop Drawings for Factory-Fabricated Handholes and Boxes Other Than Precast Concrete
            a) Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
               - Duct entry provisions, including locations and duct sizes.
               - Cover design.
               - Grounding details.
               - Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
         3) Precast or Factory-Fabricated Underground Utility Structures
            a) Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:
               - Duct entry provisions, including locations and duct sizes.
               - Reinforcement details.
               - Frame and cover design and manhole frame support rings.
               - Ladder and/or Step details.
               - Grounding details.
               - Dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
               - Joint details.
      b. Duct-Bank Coordination Drawings

1) Show duct profiles and coordination with other utilities and underground structures.
2) Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
3) Drawings shall be signed and sealed by a qualified professional engineer.
4) Typical cross sections for each ductbank.

3. Samples (NOT USED)
4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:
1. Certificates
a. Underground Ducts and Raceways – Product Certificates
1) Submit for concrete and steel used in precast concrete manholes and handholes, as required by ASTM C 858.
2. Test and Evaluation Reports (NOT USED)
3. Manufacturers' Instructions (NOT USED)
4. Source Quality Control Submittals (NOT USED)
5. Field Quality Control Submittals (NOT USED)
6. Qualifications Statements (NOT USED)
7. Manufacturer Reports (NOT USED)
8. Sustainable Design Submittals (NOT USED)
9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. Submit the following:
1. Operation and Maintenance Data (NOT USED)
2. Record Documentation
a. Underground Ducts and Raceways – Record Drawings
1) Include actual routing of underground ductbank runs on record documents in accordance with Section 01 78 39, Project Record Documents.
3. Training Material (NOT USED)
4. Warranty Documentation (NOT USED)
5. Software (NOT USED)
6. Bonds (NOT USED)
7. Maintenance Contracts (NOT USED)
8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. Submit the following.
1. Spare Parts (NOT USED)
2. Extra Stock Materials
a. Underground Ducts and Raceways – Extra Stock Materials
1) Furnish cable-support stanchions, arms, insulators, and associated fasteners in quantities equal to ten (10) percent of quantity of each item installed.
3. Tools (NOT USED)

1.6 QUALITY ASSURANCE

A. Component Supply and Compatibility:
1. Obtain all manholes and handholes furnished under this Section from a single

Supplier, unless otherwise acceptable to Engineer.
2. Manhole and handhole Supplier shall review and approve the Shop Drawing submittals for the manholes and handholes furnished.
3. Comply with NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

B. Store precast concrete and/or other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

C. Lift and support precast concrete units only at designated lifting or supporting points.

PART 2 PRODUCTS

2.1 MATERIALS

A. Material and Construction:
1. Material shall be precast or cast-in-place reinforced concrete per Contract Drawings.
2. Provide minimum interior dimensions as shown or indicated.
3. Unless otherwise indicated on drawings provide a 12-inch by 12-inch by six-inch deep sump in manhole floor
4. Duct entrances shall be sized and located to suit the ductbanks.
5. Precast Manholes:
a. Except where otherwise specified, precast manhole components shall consist of reinforced concrete pipe sections specially designed and constructed for use as manholes and manufactured in accordance with ASTM C478, except as modified in this Section.
b. Precast, reinforced concrete manhole bases, riser sections, flat slabs, and other components shall be manufactured by wet-cast methods, using forms that provide smooth surfaces free of irregularities, honeycombing, and other imperfections.
c. Joints between manhole components shall be tongue-and-groove type employing a single, continuous rubber O-ring gasket. Circumferential and longitudinal steel reinforcing shall extend into bell and spigot ends of joint without breaking steel continuity. Joints between base sections, riser sections, and top slabs of manholes six feet in diameter and less shall be rubber and concrete joints. Joints for manhole components greater than six-foot diameter shall have steel bell and spigot rings.
d. Precast manhole components shall:
1) have sufficient strength to withstand loads imposed upon them; and
2) be constructed for minimum earth cover loading of 130 pounds per cubic foot, AASHTO H-20 wheel loading, and an allowance of 30 percent in roadways and 15 percent in rights-of-way for impact.
3) Manhole bases shall have two cages of reinforcing steel in the walls, each reinforcing cage shall be of area equal to that required in the riser sections.

4) Wall thickness shall be not less than five inches.
5) Concrete top slabs shall be not less than eight inches thick.

e. Lifting holes, when provided, shall be tapered. Not more than two lifting holes shall be cast into each section. Provide tapered, solid rubber plugs to seal lifting holes. Lifting holes shall be made to be sealed by plugs driven from the outside face of section only.
f. Point of intersection (P.I.) of ductbank centerlines shall be marked with 1/4-inch diameter steel pin firmly enclosed in floor of each manhole base and protruding approximately one-inch above finished floor of base.
g. Mark date of manufacture and name or trademark of manufacturer on inside of manhole barrel.
h. Barrel of manhole shall be constructed of various lengths of riser pipe manufactured in increments of one foot to provide correct height with the fewest joints. Provide not less than one foot clear between openings in barrel of manholes for ductbanks or other penetrations and the nearest joint. Provide special manhole base or riser sections as required.
i. Provide at top of manhole barrel a precast or cast-in-place slab, or precast eccentric cone, as shown or approved, to receive manhole frame and cover.
j. Comply with ASTM C 858 and with interlocking mating sections, complete with accessories, hardware, and features.
   1) Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches (300 mm) vertically and horizontally to accommodate alignment variations.
      a) Windows shall be located no less than 6 inches (150 mm) from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
      b) Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
      c) Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.
   2) Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
      a) Type and size shall match fittings to duct or conduit to be terminated.
      b) Fittings shall align with elevations of approaching ducts and be located near interior corners of manholes to facilitate racking of cable.
k. Concrete Knockout Panels: 1-1/2 to 2 inches (38 to 50 mm) thick, for future conduit entrance and sleeve for ground rod.
l. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

6. Cast-In-Place Manholes
   a. Description: Underground utility structures, constructed in place, complete with accessories, hardware, and features. Include concrete knockout panels for conduit entrance and sleeve for ground rod.
   b. Materials: Comply with ASTM C 858 and with Division 03 Section "Cast-in-Place Concrete."

c. Structural Design Loading: As specified in Part 3 "Underground Enclosure Application" Article.

B. Accessories:
1. Frames and Covers:
a. Manufacturers: Provide products of one of the following:
1) Neenah Foundry Company.
2) East Jordan Iron Works.
b. Material: Cast iron complying with ASTM A48/A48M, Class 30A.
c. Covers: Watertight, sealed type marked “ELECTRICAL” in raised two-inch letters. Identify covers as shown or indicated on the Drawings.
d. Grout the frame to the manhole or handhole.
2. Pulling Irons:
a. Material: Galvanized steel.
b. Cast in the wall opposite to centerline of each incoming ductbank and 12 inches below centerline of bottom line of ducts.
3. Cable Racks:
a. Material: Galvanized steel cast in the wall.
b. Cable racks shall adequately support cables with space allowed for future cables.
c. Each rack shall be a vertical assembly of two-foot cable racks extending from within six inches of manhole roof slab to within six inches of manhole floor.
4. Cable Hooks:
a. Material: Galvanized steel.
b. Length: 7.5-inch minimum.
5. Insulators:
a. Material: Porcelain.

C. Duct: Provide conduit and fittings in accordance with Section 26 05 33, Raceways and Boxes for Electrical Systems. Conduit types shall be as follows:
1. Schedule 40 PVC conduits for power circuits.
2. Galvanized rigid steel conduits for the following types of circuits: low voltage status, analog, and communication.

D. Backfill: Provide backfill, including select backfill, in accordance with Section 31 00 05 Trenching and Earthwork.

E. Reinforcing: Provide Ductbank reinforcing in accordance with Section 03 20 00, Concrete Reinforcing.

F. Concrete: Provide ductbank concrete slurry in accordance with Section 31 20 00, Cast-in-Place Concrete.

G. Grounding: Provide ground cable in accordance with Section 26 05 26, Grounding and Bonding for Electrical Systems.

H. Conduit Spacers: Conduit spacers shall be nonmetallic, interlocking type to maintain spacing between conduits. Provide spacers suitable for all conduit types used in multiple sizes.

I. Duct Sealing Compound:
   1. Products and Manufacturers: Provide one of the following:
      a. 0-Z/Gedney, Type DUX.
      b. Or equal.

J. Warning Tape: Underground-line warning tape specified in Division 26 Section "Identification for Electrical Systems."

2.2 PRECAST CONCRETE HANDHOLES AND BOXES

A. Comply with ASTM C 858 for design and manufacturing processes.

B. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.
   1. Frame and Cover: Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
   2. Frame and Cover: Weatherproof steel frame, with steel cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
   3. Frame and Cover: Weatherproof steel frame, with hinged steel access door assembly with tamper-resistant, captive, cover-securing bolts.
      a. Cover Hinges: Concealed, with hold-open ratchet assembly.
      b. Cover Handle: Recessed.
   4. Frame and Cover: Weatherproof aluminum frame with hinged aluminum access door assembly with tamper-resistant, captive, cover-securing bolts.
      a. Cover Hinges: Concealed, with hold-open ratchet assembly.
      b. Cover Handle: Recessed.
   5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
   6. Cover Legend: Molded lettering, "ELECTRIC." "TELEPHONE." “FIBER OPTIC”
   7. Configuration: Units shall be designed for flush burial and have [open] [closed] [integral closed] bottom, unless otherwise indicated.
   8. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
      a. Extension shall provide increased depth of minimum of 12 inches.
      b. Slab: Same dimensions as bottom of enclosure and arranged to provide closure.
   9. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
      a. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
      b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
      c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.
   10. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
      a. Type and size shall match fittings to duct or conduit to be terminated.
      b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.

11. Handholes 12 inches wide by 24 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.3 SOURCE QUALITY CONTROL

A. Test and inspect precast concrete utility structures according to ASTM C 1037.
   1. Strength tests of complete boxes and covers shall be by either an independent testing agency or the manufacturer.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine conditions under which the Work will be installed and notify Engineer in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION FOR MANHOLES AND HANDHOLES

A. Excavation and Backfill for Manholes and Handholes:
   1. Provide manholes and handholes for electrical systems where shown or indicated and verify at the Site the required locations.
   2. Perform excavation and filling required for installing manholes and handholes for electrical systems, in accordance with Section 31 00 05 Trenching and Earthwork.
   3. Provide manholes and handholes on granular subbase course as shown or indicated. If not shown, provide layer of compacted select fill not less than six inches deep on which manhole or handhole for electrical systems will be installed.
   4. Carefully set, level, and align at proper grade manhole bases and handholes.

B. Precast Manholes:
   1. Set manhole sections vertical with steps and sections in true alignment. Butter the base of each bell or groove end at joints between components with one-to-two proportion cement-sand mortar to provide uniform bearing between components. Seal joints with cement mortar inside and out and trowel smooth to contour of wall surface. Raised or rough joint finishes are unacceptable.
   2. Install sections, joints, and gaskets in accordance with manufacturer's recommendations.
   3. Tightly seal each lifting hole with solid rubber plug driven into hole from outside of barrel; fill remaining void with one-to-two proportion cement-sand mortar.

C. Manhole and handhole structures shall be watertight. Provide grout collar to seal all penetrations into manholes and handholes for electrical systems.

D. Cable Supports in Manholes:
   1. Manhole shall be fabricated with cast-in-place galvanized steel cable support racks. Provide cable hooks to support each cable on each rack along the cable run within manholes.
   2. Individually support each cable at each hook on porcelain insulators. Provide sufficient slack for each cable.

3. Securely tie each cable in place at each insulator block to prevent excessive movement of insulators, cables, or fireproof tape. Tie cables with non-metallic 3/4-inch strapping tape manufactured by 3M or approved equal, or tie down with nylon straps.

E. Grounding:
1. Provide 3/4-inch by 10-foot copper-clad ground rod for each manhole.
2. Bond all exposed metal manhole accessories and concrete reinforcing rods with No. 4 AWG minimum bare copper wire and connect to ground rod and to the ductbank ground cable.

F. Metal Pull Box:
1. Provide NEMA 4X, stainless steel, wall-mounted pull box inside each manhole and handhole for electrical systems where analog signal cables are mixed with power cables.
2. Route conduits for analog cables directly into and out of metal pull box so that analog cables are not exposed.

G. Riser Rings:
1. Provide riser rings for manholes when required to adjust cover to proper grade. Construct riser ring on manhole roof slab or cone section on which manhole frame and cover will be placed.
2. Height of riser rings shall be as required to bring frame to proper grade and shall not exceed 6 inches in height.
3. Riser rings shall be precast concrete and shall have a minimum thickness of 2 inches and a maximum thickness of 6 inches.

H. Grading at Manholes and Handholes:
1. Unpaved Areas:
a. Install manholes and handholes in unpaved areas as shown or directed by Engineer to rim elevation higher than finished grade.
b. Grade the ground surface to drain away from manholes and handholes.
c. Provide fill around manholes and handholes to level of upper rim of manhole or handhole frame, and evenly grade the surface to a one (vertical)-to-five (horizontal) slope to surrounding grade, unless otherwise shown or directed by Engineer.
2. Paved or Travelled Areas:
a. Install manholes and handholes in paved or travelled areas to meet final grade of paved or concrete surface.
b. Manholes and handholes shall not project above finished roadway pavement.
3. Contractor shall be solely responsible for proper height of manholes and handholes necessary to reach final grade. Engineer's review of Shop Drawings and other submittals for manholes and handholes is general in nature. Provide random-length precast manhole riser sections to adjust manholes to accommodate field conditions for final grading and final elevations.

3.3 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal

joint between box and extension as recommended by the manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set so cover surface will be flush with finished grade. Set covers of other handholes 1 inch above finished grade.

D. Install handholes and boxes with bottom below the frost line, 36 inches below grade.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

F. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

G. For enclosures installed in asphalt paving and concrete paving and subject to occasional, non-deliberate, heavy-vehicle loading, provide concrete ring encircling, and in contact with, enclosure and with top surface of box cover frame. Bottom of ring shall rest on manhole.

3.4 INSTALLATION OF UNDERGROUND DUCTBANKS

A. Underground Duct Application
   1. Ducts for Electrical Cables Over 600 V: RNC, NEMA Type EPC-40 - PVC, in concrete-encased duct bank, unless otherwise indicated.
   2. Ducts for Electrical Feeders and branch circuits 600 V and Less: RNC, NEMA Type EPC-40 - PVC, in concrete-encased duct bank, unless otherwise indicated.
   3. Underground Ducts for Telephone, Communications, or Data Utility Service Cables: RNC, NEMA Type EPC-40 - PVC, in concrete-encased duct bank, unless otherwise indicated.
   4. Underground Conduits for Instrumentation and Control Wiring shall be PVC Coated galvanized rigid conduit installed in direct-buried underground conduits, unless otherwise indicated.
   5. Conduits shall use plastic ty-wrap to tie to spacers. Tie wires shall not be used.

B. Excavation and Backfilling:
   1. Provide excavation and backfilling for duct bank installation in accordance with 31 20 00 Excavation. Do not backfill with material containing large rock, paving materials, cinders, large or sharply angular substances, corrosive material, or other materials that can damage or contribute to corrosion of ducts or cables, or prevent adequate compaction of backfill.

C. Ductbank Layout:
   1. Depth: Install top of duct bank at least 36 inches below finished grade in areas not subject to deliberate traffic, and at least 42 inches below finished grade in deliberate traffic paths for vehicles, unless otherwise indicated on drawings.

D. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions. Ductbank Assembly:
   1. Assemble ductbanks using non-magnetic saddles, spacers, and separators. Position separators to provide minimum three-inch concrete separation between outer surfaces of each conduit. Provide side forms for each ductbank.
   2. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than 4 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.

E. Stub-Ups:
   1. Use manufactured PVC Coated Rigid duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Extend concrete encasement throughout the length of the elbow.
   2. Stub-Ups: Use manufactured PVC Coated Rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
      a. Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with 3 inches of concrete.
      b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.

F. Curves and Bends:
   1. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at transformer enclosures.
   2. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, for all fiber optic cable runs.
   3. Use manufactured long sweep bends with a minimum radius of 36 inches, both horizontally and vertically, at other locations, unless otherwise indicated.
   4. Use PVC coated Rigid Conduit elbows for 90 degree turns in Rigid Non-metallic Conduit within concrete encasement.

G. Concrete Placing:
   1. Provide minimum four-inch concrete covering on each side, top, and bottom of concrete envelopes around conduits. Concrete covering shall be as shown or indicated on the Drawings.
   2. Firmly fix conduits in place during concrete placing. Carefully place and vibrate concrete to fill spaces between conduits.

H. Conduit Transitions:
   1. Conduit installations shall be watertight throughout entire length of ductbank.
   2. Terminate conduits with insulated grounding bushings.
   3. Continue conduits inside buildings in accordance with Section 26 05 33.13, Rigid Conduits, and as shown or indicated in the Contract Documents.
   4. If ducts are not concrete-encased, provide expansion and deflection fittings in accordance with Section 26 05 33.26, Expansion/Deflection Fittings.
   5. Plug and seal empty spare conduits entering structures. Conduits in use entering structures shall be sealed watertight with duct sealing compound.
   6. Pulling Cord: Install 100-lbf- (445-N-) test nylon cord in ducts, including spares.

I. Ductbank Reinforcing:
   1. Provide reinforcing for all ductbanks:
   2. Install ductbank reinforcement as shown or indicated on the Drawings.
   3. Provide maximum clearance of 1.5 inches from bars to edge of concrete encasement.

J. Connections to Structures:
   1. Firmly anchor ductbanks to structure walls, building walls, or slabs. Epoxy-grout ductbank rebar into structure concrete to eliminate sheer forces between ductbank and structure wall concrete.
   2. Duct banks shall be doweled to concrete manholes, concrete hand holes, and concrete foundations with a minimum of four corners of the duct bank.
   3. Ductbank penetrations through structure walls shall be watertight.

K. Grounding:
   1. Provide bare stranded copper ductbank ground cable in each ductbank envelope. Make ground electrically continuous throughout entire ductbank system.
   2. Connect ground cable to building and station ground grid or to equipment ground buses. Also, connect ground cable to steel conduit extensions of underground ductbank system.
   3. Provide ground clamp and bonding of each steel conduit extension to maintain continuity of ground system.
   4. Terminate ground cable at last manhole or handhole for outlying structures.

L. Detectable Underground Warning Tape:
   1. Provide detectable underground warning tapes complying with Section 26 05 53, Identification for Electrical Systems, over the full length of each underground ductbank.
   2. Install warning tapes approximately 12 inches below grade.
   3. Provide multiple tapes across the width of each ductbank. Locate center of a warning tape above each edge of ductbank, and at intervals across top width of ductbank so that clear space between tapes does not exceed six inches.
   4. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

M. Reused Existing Conduits or Ducts:
   1. Pull rag swab through duct to remove water and to clean conduits prior to installing new cable.
   2. Repeat swabbing until all foreign material is removed.
   3. Pull mandrel through duct, if necessary, to remove obstructions.

N. Direct-Buried Conduits:
   1. Only single run conduit shall be direct buried unless otherwise indicated.
   2. Conduit shall be PVC coated rigid.
   3. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottoms as specified in Section 31 00 05 Trenching and Earthwork
   4. After installing conduit, backfill and compact. Start at tie-in point and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly tamp backfill around conduit to provide maximum supporting strength. Use hand tamper only.

After placing controlled backfill, make final connections at end of run and complete backfilling with normal compaction as specified in Section 31 00 05 Trenching and Earthwork.

5. Depth: Install top of conduit at least 36 inches below finished grade, unless otherwise indicated.
6. Install manufactured PVC Coated Rigid elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated.

3.5 FIELD QUALITY CONTROL

A. Watertightness:
   1. Manholes and handholes for electrical systems shall be free of visible leakage. Inspect each manhole and handhole accompanied by Engineer, and repair leaks.

B. Perform the following tests and inspections and prepare test reports:
   1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
   2. Pull test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
   3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."

C. Correct deficiencies and retest as specified above to demonstrate compliance.

3.6 CLEANING

A. Pull rag swab through duct to remove water and to clean conduits prior to installing new cable.

B. Repeat swabbing until all foreign material is removed.

C. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION

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SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
1. Contractor shall provide all labor, materials, equipment, and incidentals shown, specified, and required to furnish and install identification for electrical apparatus and electrical Work.
2. Section Includes:
   a. Identification for raceways.
   b. Identification of power and control cables.
   c. Identification for conductors.
   d. Underground-line warning tape.
   e. Warning labels and signs.
   f. Instruction signs.
   g. Equipment identification labels.
   h. Miscellaneous identification products.

B. Related Sections:
1. Section 26 05 13 Medium Voltage Cables
2. Section 26 05 19, Low Voltage Electrical Power Conductors and Cables.

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with the following:
1. NEC Article 110, Requirements for Electrical Installation.
2. NEC Article 210, Branch Circuits.
3. NEC Article 215, Feeders.
4. NEC Article 504, Intrinsically Safe Systems.
5. NEC Article 700, Emergency Systems.
6. NEC Article 701, Legally Required Standby Systems.
7. NEC Article 702, Optional Standby Systems.
8. 40 CFR 1910.145 (OSHA) – Specification for Accident Prevention Signs and Tags.
9. ANSI A13.1and IEEE C2.
10. NFPA 70.
11. NFPA 79.
12. 29 CFR 1910.144 and 29 CFR 1910.145.
13. ANSI Z535.4 for safety signs and labels.
14. Adhesive-attached labeling materials, including label stocks, laminating

adhesives, and inks used by label printers, shall comply with UL 969.

1.4 FIELD CONDITIONS

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

1.5 SUBMITTALS

A. Action Submittals. Submit the following:
   1. Product Data
      a. Identification For Electrical Systems –Product Data
         1) Manufacturer's literature, cut sheets, specifications, dimensions and technical data for all products proposed under this Section.
   2. Shop Drawings
      a. Identification For Electrical Systems – Shop Drawings
         1) Complete description and listing of proposed electrical identification and electrical identification devices for associated equipment or systems.
         2) Conduit and wire identification numbering system and equipment signage.
      b. Identification For Electrical Systems – Schedule
         1) An index of nomenclature of electrical equipment and system components used in identification signs and labels.

   3. Samples
      a. Identification For Electrical Systems – Samples
         1) For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
   4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. (NOT USED)
   1. Certificates (NOT USED)
   2. Test and Evaluation Reports (NOT USED)
   3. Manufacturers' Instructions (NOT USED)
   4. Source Quality Control Submittals (NOT USED)
   5. Field Quality Control Submittals (NOT USED)
   6. Qualifications Statements (NOT USED)
   7. Manufacturer Reports (NOT USED)
   8. Sustainable Design Submittals (NOT USED)
   9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. (NOT USED)
   1. Operation and Maintenance Data (NOT USED)
   2. Record Documentation (NOT USED)
   3. Training Material (NOT USED)
   4. Warranty Documentation (NOT USED)
   5. Software (NOT USED)
   6. Bonds (NOT USED)
   7. Maintenance Contracts (NOT USED)
   8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. (NOT USED)
   1. Spare Parts (NOT USED)
   2. Extra Stock Materials (NOT USED)
   3. Tools (NOT USED)

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

A. Engraved Identification Devices (Nameplates and Legend Plates):
   1. Lettering size and line weight shall be the same for all legend plates on the same panel or enclosure.
   2. Nameplates:
      a. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).
      b. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).
      c. Nameplates one-inch or less in height shall have one mounting hole at each end. Nameplates greater than one-inch in height shall have mounting holes in the four corners.
      d. Nameplates one-inch or less in height shall have one mounting hole at each end. Nameplates greater than one-inch in height shall have mounting holes in the four corners.
   3. Legend Plates:
      a. Legend plates for pushbuttons, pilot lights, selector switches, and other panel-mounted devices shall be large size with dimensions of approximately 2-7/16 inches wide by 2-13/32 inches tall (Allen Bradley large automotive size), plastic, custom engraved with black letters on white background.
         1) Provide standard-size legend plates where devices are mounted on motor control centers and spacing of devices precludes using automotive-size legend plates.

B. Safety Signs and Voltage Markers:
   1. Provide high voltage signs for equipment operating over 600 volts.
   2. High-Voltage Safety Signs for Outdoor Applications:
      a. Unless otherwise shown or indicated, high voltage safety signs shall be not less than 10 inches high by 14 inches wide, of fiberglass reinforced plastic, and shall comply with 40 CFR 1910.145. Signs shall resist fading from exposure to temperature extremes, ultraviolet light, abrasive, and corrosive

environments, and shall read, “DANGER – HIGH VOLTAGE – KEEP OUT”
b. Mounting hardware shall be Type 316 stainless steel. Nylon cable ties shall be permitted for applications that do not allow stainless steel hardware.

3. High-Voltage Safety Signs for Indoor Applications:
   a. High voltage safety signs for installation on indoor equipment shall be either pressure-sensitive acrylic or vinyl, and shall be not less than 10 inches high by 14 inches wide, shall comply with 40 CFR 1910.145, and shall read, “DANGER – HIGH VOLTAGE – KEEP OUT”.
4. Cable Tray Safety Signs:
   a. Cable tray safety signs shall be pressure-sensitive vinyl conforming to 40 CFR 1910.145, 5 inches by 3.5 inches in size, and shall read, “DANGER – HIGH VOLTAGE”
5. Low-Voltage Safety Signs:
   a. Low voltage safety signs shall be pressure-sensitive vinyl complying with 40 CFR 1910.145, five inches by 3.5 inches in size, and shall read, “DANGER – 480 VOLTS”.
6. Low-Voltage Markers:
   a. Low voltage markers shall be either pressure-sensitive vinyl or vinyl cloth with black lettering on orange background and shall read, “120 VOLTS”, “208 VOLTS”, “120/208 VOLTS”, or “240 VOLTS” as required.

C. Arc-flash Safety Signs:
1. Warning signs shall be adhesive-backed polyester.
2. Warning signs shall read, “Warning – Arc Flash and Shock Hazard. Appropriate PPE Required.” Arc flash warning signs shall indicate the flash protection boundary, incident energy in calories per square centimeter, hazard level, description of required protective clothing, shock hazard, limited approach boundary, restricted approach boundary, prohibited approach boundary, and equipment name.

D. Detectable Underground Warning Tape:
1. Construction: Aluminum core encased with polyethylene
2. Width: Six inches.
3. Color Finish: Red
4. Detectable Underground Warning Tape: “CAUTION: BURIED ELECTRICAL LINE BELOW”
5. Detectable Underground Warning Tape: “CAUTION: BURIED FIBER OPTIC LINE BELOW”
6. Detectable Underground Warning Tape: “CAUTION: BURIED CATV LINE BELOW”
7. Detectable Underground Warning Tape: “CAUTION: BURIED TELEPHONE LINE BELOW”

E. Thermal Printing System:
1. Utilize thermal transfer printing system to provide non-smearing labels and markers.

2.2 POWER RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Raceways Carrying Circuits at 600 V or Less:
   1. Black letter on an Orange field
   2. Legend: Indicate voltage

C. Colors for Raceways Carrying Circuits at More Than 600 V:
   1. Black letters on a red field.
   2. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- (75-mm-) high letters on 20-inch (500-mm) centers.

D. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

E. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.3 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Colors for Raceways Carrying Circuits at 600 V and Less:
   1. Black letters on an orange field
   2. Legend: Indicate voltage

C. Colors for Raceways Carrying Circuits at More Than 600 V:
   1. Black letters on a red field.
   2. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- (75-mm-) high letters on 20-inch (500-mm) centers.

D. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

E. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

2.4 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

D. Colors: Text shall be black letters on a white field

2.5 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.6 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
   1. Engraved legend with black letters on white face.
   2. Punched or drilled for mechanical fasteners.
   3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm). Overlay shall provide a weatherproof and UV-resistant seal for label.

2.7 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
   1. Minimum Width: 3/16 inch (5 mm).
   2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
   3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
   4. Color: Black.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
   1. Minimum Width: 3/16 inch (5 mm).
   2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
   3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
   4. Color: Black.

C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
   1. Minimum Width: 3/16 inch (5 mm).
   2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 7000 psi (48.2 MPa).
   3. UL 94 Flame Rating: 94V-0.
   4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
   5. Color: Black.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

2.9 FABRICATION

A. Engraved Identification Devices (Nameplates and Legend Plates):
   1. Nameplate and legend plate text is preliminary and subject to change pending final review and approval of nomenclature by Engineer after start-up and testing.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide electrical identification in accordance with manufacturer recommendations and as required for proper identification of equipment and materials.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

E. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

G. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

H. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

I. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
   1. Outdoors: UV-stabilized nylon.
   2. In Spaces Handling Environmental Air: Plenum rated.
   3. Twist off excess length. Ensure ends are smooth and round.

J. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape per drawing detail. If no detail exists install directly

above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench [or concrete envelope] exceeds 16 inches (400 mm) overall.

K. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application

L. Engraved Identification Devices (Nameplates and Legend Plates):
   1. Equipment to Be Labeled:
      a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive, engraved or engraved, laminated acrylic or melamine label.
      b. Enclosures and electrical cabinets.
      c. Access doors and panels for concealed electrical items.
      d. Switchgear.
      e. Switchboards.
      f. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
      g. Substations.
      h. Emergency system boxes and enclosures.
      i. Motor-control centers.
      j. Enclosed switches.
      k. Enclosed circuit breakers.
      l. Enclosed controllers.
      m. Variable-speed controllers.
      n. Push-button stations.
      o. Power transfer equipment.
      p. Contactors.
      q. Remote-controlled switches, dimmer modules, and control devices.
      r. Battery-inverter units.
      s. Battery racks.
      t. Power-generating units.
      u. Monitoring and control equipment.
      v. UPS equipment.
   2. Unless otherwise indicated in the Contract Documents, attach permanent nameplates with permanent adhesive and with 3/16-inch diameter, round head, stainless steel machine screws into drilled and tapped holes.
   3. Provide nameplate with 1.5-inch high letters to identify each console, cabinet, control station, panel, or enclosure as shown or indicated.
   4. Provide nameplates for field-mounted motor starters, disconnect switches, manual starter switches, pushbutton stations, and similar equipment operating components, which shall describe motor or equipment function and circuit number.
   5. Provide nameplates with 1/2-inch high letters to identify each junction and terminal box shown or indicated.
   6. On control panel enclosures, provide nameplates for each main and feeder circuit including control fuses, and for each indicating light and instrument.
      a. Provide nameplate with 1.5-inch high letters giving switchgear designation, voltage rating, ampere rating, short circuit rating, manufacturer's name, general order number, and item number.

b. Identify individual door for each compartment with nameplate giving item designation and circuit number.

7. Electrical Distribution Panel Identification
   a. Panel designator shall consist of the following designator and format: Four digit Building number followed by a colon followed by a one digit floor number, followed by Voltage Designation (H/L) and one digit panel number.
   b. Voltage Designation shall be “H” for 277/480 V and “L” for 120/208 V.
   c. Format: BBBB:FVP
      1) Example: 1000:1H1
         a) Building Number:1000
         b) Floor Number:1
         c) Voltage: 480 V
         d) Panel Number:1
8. Switchgear:
   a. Provide nameplate with 1.5-inch letters with switchgear designation.
   b. Provide nameplates for each main and feeder circuit.
   c. Identify individual door for each unit compartment with nameplate identifying controlled equipment.
9. Motor Control Centers:
   a. Provide nameplate with 1.5-inch letters with motor control center designation.
   b. Identify individual door for each unit compartment with nameplate identifying controlled equipment.
10. Except conduit, all electrical appurtenances including lighting panels, convenience outlets, fixtures, and lighting switches, shall be provided with nameplates indicating appropriate circuit breaker number(s).
11. Push Buttons:
    a. Provide legend plates for identification of functions.
    b. Provide nameplates for identification of controlled equipment.
    c. Name plates shall use the control panel reference designator and shall comply with NFPA 79.
12. Pilot Lights:
    a. Provide legend plates for identification of functions.
    b. Provide nameplates for identification of controlled equipment.
    c. Name plates shall use the control panel reference designator and shall comply with NFPA 79.
13. Selector Switches:
    a. Provide legend plates for identification of functions.
    b. Provide nameplates for identification of controlled equipment.
    c. Name plates shall use the control panel reference designator and shall comply with NFPA 79.
14. Panel Mounted Instruments:
    a. Provide nameplates for identification of function.
    b. Name plates shall use the control panel reference designator and shall comply with NFPA 79.
15. Interiors of Cabinets, Consoles, Panels, Terminal Boxes, and Other Enclosures:
    a. Provide nameplates for identification.
    b. Name plates shall use the control panel reference designator and shall comply with NFPA 79.
    c. Provide each item inside cabinet, console, panel, terminal box, or enclosure with laminated plastic nameplate as shown on approved Shop Drawings and

Contractor's other submittals. Install nameplates with adhesive.

d. Interior items require nameplates and shall use the reference designators as indicated on the bill of materials and electrical schematics. Items include, but not limited to:
   1) Terminal blocks and strips.
   2) Bus bars.
   3) Relays.
   4) Rear of face-mounted items.
   5) Rear of door-mounted items.
   6) Interior mounted items that require identification when mounted externally.
   7) PLC
   8) UPS
   9) Radio
   10) Surge Protective Devices

e. Circuit Breaker Directory:
   1) Provide engraved laminated plastic directory listing function and load controlled for each circuit breaker within panel used for power distribution.

16. Re-label existing equipment whose designation have changed.

M. Safety Signs and Voltage Markers:
1. Provide safety signs and voltage markers on and around electrical equipment as shown or indicated.
   a. Install rigid safety signs using stainless steel fasteners.
   b. Clean surfaces before applying pressure-sensitive signs and markers.
2. Install high voltage safety signs on all equipment doors providing access to uninsulated conductors, including terminal devices, greater than 600 volts.
3. Provide cable tray safety signs on both sides of cable trays at maximum intervals of 20 feet. Install signs on side rails of tray as acceptable to Engineer.
   a. Label cable trays that contain conductors greater than 600 volts with cable tray safety signs.
   b. Cable trays that contain conductors greater than 208 volts and less than 600 volts shall be labeled with low voltage safety signs.
   c. Cable trays that contain conductors of 120/208 volts shall be labeled with low voltage markers.
   d. Label cable trays that contain intrinsically safe wiring or cables in accordance with NEC Article 504.
4. Install low voltage safety signs on equipment doors that provide access to uninsulated 480-volt conductors, including terminal devices.
5. Install low voltage markers on each terminal box, safety disconnect switch, and panelboard installed, modified, or relocated as part of the Work and containing 120/208 volt conductors.

N. Voltage System Identification Directories
1. Provide voltage system identification directories as required by NEC Article 210 and NEC Article 215.
2. Provide in each electrical room voltage system identification directory mounted on wall or door at each entrance to room.
3. For panelboards, switchboards, motor control centers, and other branch circuit or feeder distribution equipment that are not located in electrical rooms, provide voltage system identification directory mounted on equipment.

a. Directories shall be affixed using epoxy glue. Screws or bolts shall not penetrate equipment enclosures.
b. Directories shall be readily visible and not obscure labels and other markings on equipment.

O. Arc-flash Safety Signs:
1. Provide arc-flash safety signs as required by NFPA 70..
2. Provide signs for switchboards, panelboards, motor control centers, and industrial control panels. Provide signs for control panels that contain 480 volt equipment. Provide arc flash warning signs on other equipment where the incident energy is greater than 1.2 calories per square centimeter.

P. Conduit Labels:
1. Provide conduits with conduit labels unless otherwise shown or indicated.
2. Do not label flexible conduit.
3. Do not label exposed single conduit runs of less than 25 feet between local disconnect switches and their associated equipment.
4. Conduit labels shall indicate the following information:
a. Voltage
5. Conduits that contain intrinsically safe wiring shall have an additional conduit marker provided that has blue letters on white background and reads, “INTRINSICALLY SAFE WIRING”.
a. Install intrinsically safe pipe markers in accordance with NEC Article 504 along entire installation. Spacing between labels shall not exceed 25 feet.
6. Provide conduit labels at the following locations:
a. Where each conduit enters and exits walls, ceilings, floors, or slabs.
b. Where conduit enters or exits boxes, cabinets, consoles, panels, or enclosures, except pull boxes and conduit bodies used for pull boxes.
c. At maximum intervals of 50 feet along length of conduit.
7. Orient conduit labels to be readable. Text shall be left to right on horizontal conduits and down to up on vertical conduits.

Q. Wire and Cable Identification:
1. Color-coding of insulated conductors shall comply with Section 26 05 19 Low Voltage Electrical Power Conductors and Cables, and also comply with Section 26 05 13 Medium Voltage Cable
2. Text shall be left to right on horizontal conduits and down to up on vertical conduits.
3. Use wrap-around labels where wire or cable is to be labeled but is not terminated. Wire and cable shall be uniquely individually labeled. (i.e. Spare 1, Spare 2,….)
4. Do not provide labels for the following:
a. Bare (uninsulated) conductors, unless otherwise shown or indicated as labeled.
5. Provide wire and cable labels for the following:
a. New, rerouted, or revised wire or cable.
b. Insulated conductors.
c. Wire and cable terminations:
1) Wire labels shall be applied outside of the wireway between the wireway and the terminal.
2) Apply cable labels between 1/2-inch and one inch of cable breakout into

individual conductors.
a) Label individual conductors in a cable after breakout as specified for wires.

d. Wire or cable exiting cabinets, consoles, panels, terminal boxes, and enclosures.
1) Label wires or cables within two inches of entrance to conduit.
e. Wire or cable in junction boxes and pull boxes
1) Label wires or cables within two inches of entrance to conduit.
f. Wire and cable installed in cable tray.
1) Wire and cable shall have labels at maximum intervals of 20 feet.
g. Wire and cable installed without termination in electrical manholes.
1) Wire and cable shall have wrap-around labels applied within one foot of exiting manhole.

6. Modified Cabinets, Consoles, Panels, and Enclosures:
a. New or rerouted wire or cable in existing cabinets, consoles, panels, and enclosures shall be labeled using the same format and designation as shown above where possible. Where existing equipment naming differs from format listed above coordinate with Owner.

R. Terminal Strip Labeling:
1. Label panel side of terminal to match panel wire number.
2. Label field side of terminal to match field wire number.

S. Generator System Warning Signs:
1. Provide warning signs for generator systems as required by NEC.
2. Install generator location warning sign on or immediately adjacent to service equipment, or to “normal” source disconnecting means when generator is located out of sight of service equipment or disconnecting means.
3. Install generator grounding warning sign on enclosure or immediately adjacent to point where generator neutral is connected to grounding electrode system if connection is made remote from generator.

END OF SECTION

SECTION 26 11 16.11

SECONDARY UNIT SUBSTATIONS – SECONDARY LESS THAN 1000 V

PART 1 GENERAL

1.1 SCOPE

A. The Contractor shall furnish and install the secondary unit substation(s) complete from the incoming line terminals to the outgoing line terminals as specified herein and as shown on the contract drawings.

B. The secondary unit substation shall consist of primary equipment, transformer and secondary equipment as specified below. The manufacturer of the unit substation shall furnish and coordinate all major components of the substations, including incoming primary equipment section, transformer and low-voltage section, as well as circuit breakers, fusible switches, and metering components. Provide a single warranty covering all substation assemblies, transformers and components.

C. Connections between the primary device and transformer shall be bus and between the transformer and secondary shall be flexible bus braid.

D. Outdoor primary and secondary equipment where specified shall be of weatherproof construction, rodent proof and shall contain 120-volt space heaters, receptacles and lighting as required.

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Unit Substations.

1.3 RELATED SECTIONS

A. Section 26 12 16 – Substation Transformers – Dry-Type

B. Section 26 37 13 - Microgrid Energy Management System

C. Section 26 13 26 – Metal-Clad Switchgear– Medium Voltage

D. Section 26 13 13 – Metal-Enclosed Breaker Switchgear – Medium Voltage

E. Section 26 24 13. – LV Distribution Switchboards – Low Voltage

1.4 REFERENCES

A. The secondary unit substation shall be designed, assembled, tested and installed in accordance with latest applicable standards of NEMA, IEEE and ANSI, applicable to its three major sections:

1. MV Metal-Clad Switchgear – NEMA SG4, SG5; ANSI C37
2. MV Metal-Enclosed Switchgear – NEMA SG4, SG5; ANSI C37
3. MV Load Interrupter Switchgear – NEMA SG4, SG5; ANSI C37
4. MV Motor Controllers – ANSI/NEMA ICS-3-Part 2, UL347
5. Secondary Substation Transformers – NEMA 210, IEEE 100, ANSI C57
6. LV Metal-Enclosed Switchgear – ANSI C37, UL 1558
7. LV Distribution Switchboards – NEMA PB-2, UL 891

1.5 SUBMITTALS – FOR REVIEW/APPROVAL

A. The following information shall be submitted to the Engineer:

1. Master drawing index
2. Front view elevation
3. Floor plan
4. Single line
5. Schematic diagram
6. Nameplate schedule
7. Component list
8. Conduit entry/exit locations
9. Assembly ratings including:
    a. Short-circuit rating
    b. Voltage
    c. Continuous current
    d. Basic Impulse level for equipment over 600 volts
    e. kVA
10. Major component ratings including:
    a. Voltage
    b. Continuous current
    c. Interrupting ratings
11. Cable terminal sizes
12. Connection details between close-coupled assemblies
13. Composite front view and floor plan of close-coupled assemblies
14. Impedance for transformers
15. Product data sheets

B. Where applicable, the following additional information shall be submitted to the Engineer:

1. Busway connection
2. Key interlock scheme drawing and sequence of operation

1.6 SUBMITTALS – FOR CONSTRUCTION

A. The following information shall be submitted for record purposes:

1. Final as-built drawings and information for items listed Paragraph 1.04, and shall incorporate all changes made during the manufacturing process
2. Wiring diagrams
3. Certified production test reports

4. Installation information

5. Seismic certification as specified

1.7 QUALIFICATIONS

A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

D. Provide Seismic tested equipment as follows:

1. The equipment and major components shall be suitable for and certified by actual seismic testing to meet all applicable seismic requirements of the latest California Building Code (CBC) with OSHPD Amendments.

2. The Project Structural Engineer will provide site specific ground motion criteria for use by the manufacturer to establish SDS values required.

3. The IP rating of the equipment shall be 1.5

4. The Structural Engineer for the Site will evaluate the SDS values published on the Manufacturer's website to ascertain that they are "equal to" or "greater than" those required for the Project Site.

5. The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.

a. The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared and stamped by a licensed civil engineer in the state. Mounting recommendations shall be provided by the manufacturer based upon the above criteria to verify the seismic design of the equipment.

b. The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above codes.

c. The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

1.8 REGULATORY REQUIREMENTS

A. Certified copies of production test reports shall be supplied demonstrating compliance with these standards when requested by the engineer.

1.9 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.10 OPERATION AND MAINTENANCE MANUALS

A. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets, instruction bulletins, and renewal parts lists where applicable for the complete assembly and each major component.

PART 2 A PRODUCTS – PRIMARY EQUIPMENT

Metal-Enclosed Switchgear – Section 26 13 13

B PRODUCTS – TRANSFORMERS

Dry-Type Transformers Section 26 12 16

C PRODUCTS – SECONDARY EQUIPMENT

Switchboards Low Voltage Section 26 24 13

Surge Protection Devices Section 26 43 13

Include surge protection device (SPD) on the secondary side of all unit substations.

PART 3 EXECUTION

3.1 FACTORY TESTING

A. Standard factory tests shall be performed on the primary equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.

B. The following factory tests shall be made on all transformers. All tests shall be in accordance with the latest revision of ANSI and NEMA standards.

1. Resistance measurements of all windings on the rated voltage connection of each unit and at the tap extremes of one unit only of a given rating on this project
2. Ratio tests on the rated voltage connection and on all tap connections
3. Polarity and phase-relation tests on the rated voltage connections
4. No-load loss at rated voltage on the rated voltage connection
5. Exciting current at rated voltage on the rated voltage connection
6. Impedance and load loss at rated current on the rated voltage connection of each unit and on the tap extremes of one unit only of a given rating on this project
7. Applied potential test
8. Induced potential tests
9. Temperature test(s) shall be made on all units. Tests shall not be required when there is available a record of a temperature test on an essentially duplicate unit. When a transformer is supplied with auxiliary cooling equipment to provide more than one kVA rating, temperature tests as listed above shall be made on the lowest kVA OA or AA rating and the highest kVA FA rating

10. ANSI impulse test on all primary windings

C. The following standard factory tests shall be performed on the secondary equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.

1. The switchgear shall be completely assembled, wired, adjusted and tested at the factory. After assembly, the complete switchgear shall be tested to ensure the accuracy of the wiring and the functioning of all equipment. The main bus system shall be given a dielectric test of 2200 volts for one minute between live parts and ground and between opposite polarities

2. The wiring and control circuits shall be given a dielectric test of 1500 volts for one minute or 1800 volts for one second between live parts and ground, in accordance with ANSI C37.20.1

D. The manufacturer shall provide three (3) certified copies of factory test reports.

E. Factory tests as outlined above shall be witnessed by the owner's representative unless declined by the owner or owner's representative in writing.

1. The manufacturer shall notify the owner two (2) weeks prior to the date the tests are to be performed

2. The manufacturer shall include the cost of transportation and lodging for up to three (3) owner's representatives. The cost of meals and incidental expenses shall be the owner's responsibility

3.2 FIELD QUALITY CONTROL

A. Provide the services of a qualified factory-trained manufacturer's representative to assist the Contractor in installation and startup of the equipment specified under this section. The manufacturer's representative shall provide technical direction and assistance to the contractor in general assembly of the equipment, connections and adjustments, and testing of the assembly and components contained herein.

B. The Contractor shall provide three (3) copies of the manufacturer's field startup report.

3.3 MANUFACTURER'S CERTIFICATION

A. A qualified factory-trained manufacturer's representative shall certify in writing that the equipment has been installed, adjusted and tested in accordance with the manufacturer's recommendations.

B. The Contractor shall provide three (3) copies of the manufacturer's representative's certification.

3.4 TRAINING

A. The Contractor shall provide a training session for up to five (5) owner's representatives for a minimum of 1 normal workday at a job site location determined by the owner.

B. The training session shall be conducted by a manufacturer's qualified representative. The training program shall include instructions on the assembly including primary equipment, transformer, and secondary equipment. All circuit breakers, protective devices and other major components shall be included.

3.5 INSTALLATION

A. The contractor shall install all equipment per the manufacturer's recommendation

and the contract drawings.

B. All necessary hardware to secure the assembly in place shall be provided by the contractor.

3.6 FIELD ADJUSTMENTS

3.7 FIELD TESTING

END OF SECTION

SECTION 26 12 16

SUBSTATION TRANSFORMERS – DRY-TYPE

PART 1 GENERAL

1.1 SCOPE

A. The Contractor shall furnish and install the primary and/or secondary substation transformers as specified herein and as shown on the contract drawings.

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Unit Substations.

1.3 RELATED SECTIONS

A. 26 11 16 Secondary Unit Substation

1.4 REFERENCES

A. The substation transformers shall be designed, manufactured and tested in accordance with the latest applicable standards of NEMA and ANSI. ANSI C57

1.5 SUBMITTALS – FOR REVIEW/APPROVAL

A. The following information shall be submitted to the Engineer:

1. Master drawing index
2. Front view elevation and weight
3. Plan view
4. Schematic diagrams
5. Nameplate diagram
6. Component list
7. Conduit entry/exit locations
8. Ratings including:
    a. kVA
    b. Primary and secondary voltage
    c. Taps
    d. Primary and secondary continuous current
    e. Basic Impulse Level
    f. Impedance
    g. Insulation class and temperature rise
9. Cable terminal sizes
10. Product data sheets

B. Where applicable, the following additional information shall be submitted to the

Engineer:

1. Busway connection
2. Connection details between close-coupled assemblies
3. Composite floor plan of close-coupled assemblies
4. Key interlock scheme drawing and sequence of operations

1.6 SUBMITTALS – FOR CONSTRUCTION

A. The following information shall be submitted for record purposes:

1. Final as-built drawings and information for items listed in Section 1.04 and shall incorporate all changes made during the manufacturing process.
2. Wiring diagrams
3. Certified production test reports
4. Installation information
5. Seismic certification as specified

1.7 QUALIFICATIONS

A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

D. Provide Seismic tested equipment as follows:

1. The equipment and major components shall be suitable for and certified by actual seismic testing to meet all applicable seismic requirements of the latest California Building Code (CBC) with OSHPD Amendments.
2. The Project Structural Engineer will provide site specific ground motion criteria for use by the manufacturer to establish SDS values required.
3. The IP rating of the equipment shall be 1.5
4. The Structural Engineer for the Site will evaluate the SDS values published on the Manufacturer's website to ascertain that they are "equal to" or "greater than" those required for the Project Site.
5. The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.
    a. The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared and stamped by a licensed civil engineer in the state. Mounting recommendations shall be provided by the manufacturer based upon the above criteria to verify the seismic design of the equipment.
    b. The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above

codes.

c. The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

1.8 REGULATORY REQUIREMENTS

A. UL label required.

1.9 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.10 OPERATION AND MAINTENANCE MANUALS

A. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets, instruction bulletins and renewal parts lists where applicable, for the complete assembly and each major component.

1.11 FIELD MEASUREMENTS

A. Measure primary and secondary voltages and make appropriate Tap adjustments.

PART 2 PRODUCTS – DRY-TYPE TRANSFORMERS

2.1 MANUFACTURERS

Example Product Manufacturers: Products and manufacturers specified are to establish a standard of quality for design, function, materials, and appearance. Products shall be modified as necessary by the manufacturer for compliance with requirements. The listed manufacturers are provided for example only and are not intended to represent all qualified manufactures. Contractor may select an alternate manufacturer provided the product(s) comply with all design requirements.

A. Eaton (Basis for Design)

B. ABB

C. Schneider Electric

D. GE

The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will also be considered.

2.2 RATINGS

A. The ratings of the transformer shall be as shown on the drawings and described below.

kVA Rating	As shown on drawings	
Impedance	5.75%	ANSI Standard Tolerance
HV	12kV	kV [Delta/Wye as shown on drawings]
HV BIL	95kV	kV
LV	480V	Volts Wye
LV BIL	45	kV

B. Minimum of two 2-1/2 percent FCAN and two 2-1/2 percent FCBN primary taps.

2.3 CONSTRUCTION

A. Forced air (FA) units for 300 kVA and above shall contain all necessary components and wiring, including fans, for automatically increasing the kVA rating by 33%. The (FA) package shall include an electronic temperature monitor and fan control unit. The package shall include a TC-50 Transformer Temperature Controller that monitors up to three (3) ventilated Dry Type transformer windings and (1) ambient temperature. The controller's electronic components shall be conformally coated to prevent premature failure due to extreme environmental conditions. The controller shall operate relays by comparing the highest winding temperature to stored set point temperatures and display four (4) thermocouple inputs as well as the stored maximum temperature and its associated winding. The unit shall provide Fans, Alarm, and Trip output relays. Form C contacts shall be provided to trip the transformer off-line if any of the winding temperatures exceeds the trip setting. A test function shall be provided to: test the digital display and all of the LEDs; simulate over-temperature conditions; and check the internal temperature of the monitor. A 4-20 mA analog signal shall be provided for remote indication or for use with SCADA systems or Microgrid Energy Management System (refer to section 26 37 13 for requirements). Control power shall be provided from a control power transformer in the secondary equipment, a separate, external control power source or internal control power transformer.

B. The electrical insulation system shall utilize Class H material in a fully rated 220 degrees C system. Transformer design temperature rise shall be based on a 30 degrees C average ambient over a 24-hour period with a maximum of 40 degrees C. Solid insulation in the transformer shall consist of inorganic materials such as porcelain, glass fiber, electrical grade glass polyester, electrical grade epoxy, or Nomex. All insulating materials must be rated for continuous 220 degree C duty. The insulation between the high- and low-voltage coils shall be more than sufficient for the voltage stress without the need of a varnish.

C. The transformer shall be designed for a temperature rise of 80 degrees C and shall be capable of operating at 35% above base nameplate kVA capacity continuously without any loss of life.

D. The transformer shall be designed to meet the sound level standards for dry-type transformers as defined in NEMA TR1. The measurement procedure shall be as specified in ANSI C57.12.90.

E. The transformer shall be UL labeled.

F. The transformer shall be of explosion-resistant, fire-resistant, air-insulated, ventilated dry-type construction, and cooled by the natural circulation of air through the windings.

G. High-voltage and low-voltage windings shall be copper. Insulation between layers of the windings shall be by Insuldur paper or equal.

H. For enhanced environmental protection, the entire core and coil assembly shall be

Vacuum Pressure Encapsulated (VPE) with a silicone resin per MIL-1-24092. The total VPE process shall apply a four (4) cycle shield of silicone resin to the coils and a two (2) cycle protective shield to the bus, core and support structure. The VPE process shall effectively encapsulate the entire core and coil assembly which results in a transformer which is virtually impermeable to moisture, dust, dirt, salt, air, and other industrial contaminants.

I. The high- and low-voltage coil assembly shall be preheated to evaporate any moisture, then placed into a vacuum pressure tank. The air in the tank shall be evacuated; and at extremely low absolute pressure, all air bubbles are to be drawn out of the insulating materials. The resin shall be introduced to a level that submerges all parts while the vacuum is maintained. Then the vacuum shall be released and pressure applied, after which the coil shall be removed and placed in an oven for several hours in order for the resin to catalyze into a composite mass, completely sealing and binding the winding.

J. The transformer shall be supplied in a knockdown case design, for ease in fitting through limited openings, and shall be of heavy gauge sheet steel construction, equipped with removable panels for access to the core and coils. Front and rear panels shall incorporate lowered ventilating grills.

K. Where outdoor dry-type transformers are shown on the drawings, they shall include thermostatically controlled space heaters fed from an external source which remains energized when the transformer is de-energized or a fused control power transformer connected to the primary side of the substation transformer. Provide NEMA 3R enclosure with special ventilating grills that restrict the passage of rain or spray.

2.4 ACCESSORIES

A. Transformer shall include:

1. Diagram instruction plate
2. Provisions for lifting and jacking
3. Removable center panel for access to high-voltage strap-type connector taps for de-energized tap changing
4. Two ground pads with continuous ground bus

2.5 FINISH

A. The paint shall be applied using an electrostatically deposited dry powder system to a minimum of three (3) mils average thickness. Outdoor dry-type transformer units shall include suitable outdoor paint finish. Units shall be painted ANSI 61 for indoor service or outdoor service and shall match the primary and secondary equipment.

PART 3 EXECUTION

3.1 FACTORY TESTING

A. The following standard factory tests shall be performed on all equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.

1. Resistance measurements of all windings on the rated voltage connection of each unit and at the tap extremes of one unit only of a given rating on this project
2. Ratio tests on the rated voltage connection and on all tap connections

3. Polarity and phase-relation tests on the rated voltage connections
4. No-load loss at rated voltage on the rated voltage connection
5. Exciting current at rated voltage on the rated voltage connection
6. Impedance and load loss at rated current on the rated voltage connection of each unit and on the tap extremes of one unit only of a given rating on this project
7. Applied potential test
8. Induced potential tests
9. For dry-type and cast-coil units, the manufacturer shall perform additional 100% quality control impulse test on the primary windings of each unit

B. The manufacturer shall provide three (3) certified copies of factory test reports.

C. The following special factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest revision of ANSI and NEMA standards.

1. Temperature test(s) shall be made on [all units]. Tests shall not be required when there is an available record of a temperature test on an essentially duplicate unit. When a transformer is supplied with auxiliary cooling equipment to provide more than one rating, temperature tests as listed above shall be made on the lowest kVA OA or AA rating and the highest kVA FA rating
2. ANSI impulse test on all primary windings

D. Factory tests as outlined above shall be witnessed by the owner's representative.

1. The manufacturer shall notify the owner two (2) weeks prior to the date the tests are to be performed
2. The manufacturer shall include the cost of transportation and lodging for up to three (3) owner's representatives. The cost of meals and incidental expenses shall be the owner's responsibility

3.2 FIELD QUALITY CONTROL

A. The Contractor shall provide three (3) copies of the manufacturer's field startup report.

3.3 MANUFACTURER'S CERTIFICATION

A. A qualified factory-trained manufacturer's representative shall certify in writing that the equipment has been installed, adjusted and tested in accordance with the manufacturer's recommendations.

B. The Contractor shall provide three (3) copies of the manufacturer's representative's certification.

3.4 INSTALLATION

A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.

B. All necessary hardware to secure the assembly in place shall be provided by the Contractor.

3.5 FIELD ADJUSTMENTS

A. Adjust taps to deliver appropriate secondary voltage.

3.6 FIELD TESTING

A. Measure primary and secondary voltages for proper tap settings.

B. Megger primary and secondary windings.

END OF SECTION

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SECTION 26 13 13

SWITCHGEAR – METAL ENCLOSED MV BREAKER

PART 1 GENERAL

1.1 SCOPE

A. The Contractor shall furnish and install the medium voltage metal enclosed switchgear equipment as specified herein and as shown on the contract drawings.

1.2 MEASUREMENT & PAYMENT

A. This item is to be included in lump sum cost for unit substations.

1.3 REFERENCES

A. The medium voltage metal-enclosed switchgear and all components shall be designed, manufactured and tested in accordance with the latest applicable standards as follows:

   A. ANSI/IEEE C37.20.3

   B. ANSI/IEEE C37.20.4

   C. ANSI C37.22

   D. ANSI C37.57, C37.58

   E. CSA 22.2 No. 31 -04

   F. EEMAC G8-3.3

   G. NEMA SG5

   H. NEMA SG6

B. Listing to comply with Underwriters Laboratories shall be provided for 5 kV or 15 kV class medium voltage metal enclosed switchgear.

1.4 SUBMITTALS – FOR REVIEW/APPROVAL

A. The following information shall be submitted to the Engineer:

   A. Master drawing index

   B. Front view elevation

   C. Floor plan

   D. Top view

   E. Single line

   F. Nameplate schedule

   G. Component list

   H. Conduit entry/exit locations

   I. Assembly ratings including:

      a. Short-circuit rating

b. Voltage

c. Continuous current

d. Basic Impulse Level

J. Major component ratings including:

a. Voltage

b. Continuous current

c. Interrupting ratings

K. Cable terminal sizes

L. Product data sheets

B. Where applicable, the following additional information shall be submitted to the Engineer:

A. Bus duct connection

B. Connection details between close-coupled assemblies

C. Composite floor plan of close-coupled assemblies

D. Key interlock scheme drawing and sequence of operations

E. Descriptive bulletins

F. Product data sheets

1.5 SUBMITTALS – FOR CONSTRUCTION

A. The following information shall be submitted for record purposes:

A. Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process

B. Wiring diagrams

C. Certified production test reports

D. Installation information including equipment anchorage provisions

E. Seismic certification as specified

1.6 QUALIFICATIONS

A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

D. Provide Seismic tested equipment as follows:

A. The equipment and major components shall be suitable for and certified by actual seismic testing to meet all applicable seismic requirements of the latest California Building Code (CBC) with OSHPD Amendments.

B. The Project Structural Engineer will provide site specific ground motion criteria for use by the manufacturer to establish SDS values required.

C. The IP rating of the equipment shall be 1.5

D. The Structural Engineer for the Site will evaluate the SDS values published on the Manufacturer's website to ascertain that they are "equal to" or "greater than" those required for the Project Site.

E. The following minimum mounting and installation guidelines shall be met, unless specifically modified by the above referenced standards.

a. The Contractor shall provide equipment anchorage details, coordinated with the equipment mounting provision, prepared and stamped by a licensed civil engineer in the state. Mounting recommendations shall be provided by the manufacturer based upon the above criteria to verify the seismic design of the equipment.

b. The equipment manufacturer shall certify that the equipment can withstand, that is, function following the seismic event, including both vertical and lateral required response spectra as specified in above codes.

c. The equipment manufacturer shall document the requirements necessary for proper seismic mounting of the equipment. Seismic qualification shall be considered achieved when the capability of the equipment, meets or exceeds the specified response spectra.

1.7 REGULATORY REQUIREMENTS

1.8 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

B. Each switchgear assembly shall be split into shipping groups for handling as indicated on the drawings or per the manufacturer's recommendations. Shipping groups shall be designed to be shipped by truck, rail or ship. Shipping groups shall be bolted to skids. Accessories shall be packaged and shipped separately. Each switchgear shipping group shall be equipped with lifting eyes for handling solely by crane.

1.9 OPERATION AND MAINTENANCE MANUALS

A. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets and instruction bulletins for the complete assembly and each major component.

PART 2 PRODUCTS

A. Example Product Manufacturers: Products and manufacturers specified are to establish a standard of quality for design, function, materials, and appearance. Products shall be modified as necessary by the manufacturer for compliance with requirements. The listed manufacturers are provided for example only and are not intended to represent all qualified manufactures. Contractor may select an alternate manufacturer provided the product(s) comply with all design requirements.

2.1

A. Eaton (Basis for Design)

B. ABB

C. Schneider Electric

The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will also be considered.

2.2 RATINGS – SWITCHGEAR, SWITCH AND CIRCUIT BREAKER

A. The 15 kV switchgear assembly ratings shall be as follows:

Maximum Design Voltage	15 kV
Lighting Impulse Voltage Withstand	95 kV
Nominal System Voltage	12 kV three-phase four wire
System Grounding	solid
Short-Time (2-Second) Current	_____Ka

NOTE: SHORT-CIRCUIT CURRENT RATINGS SHALL BE COORDINATED WITH SAN DIEGO GAS & ELECTRIC AND APPROVED BY THE ENGINEER.

Main Cross Bus Continuous Current Rating	600 A

A. Each circuit breaker shall have the following ratings:

Maximum Voltage	15 kV
BIL Rated	95 kV Peak
Continuous Current (15 kV)	600 A (minimum)
Short-Circuit Current at rated Maximum kV	_____kA RMS sym
Rated Voltage Range Factor K	_____
Closing and Latching Capability	_____kA Crest
Maximum Symmetrical Interrupting and 3-Second Rating	_____kA RMS SYM Rated
Interrupting Time	5 Cycles

NOTE: SHORT-CIRCUIT CURRENT RATINGS SHALL BE COORDINATED WITH SAN DIEGO GAS & ELECTRIC AND APPROVED BY THE ENGINEER.

B. Load Interrupter Switches

A.	Non-Fused Switch (Continuous and Load Break)	600 Amperes
B.	Non-Fused Momentary Withstand	61 kA Asym RMS
C.	Non-Fused Switch Fault close RMS	61 kA Asymmetrical
D.	Non-Fused 2-Second short circuit current withstand	38 kA Sym RMS

E.	Fuse Rating	200 Amperes
F.	Type of Fuse	Boric Acid Expulsion
G.	Fuse Interrupting Rating	14.4 kA Sym RMS
H.	Fused Switch Fault Close	23 kA Asym RMS

NOTE: SHORT-CIRCUIT CURRENT RATINGS SHALL BE COORDINATED WITH SAN DIEGO GAS & ELECTRIC AND APPROVED BY THE ENGINEER.

2.3 CONSTRUCTION

A. The switchgear assembly shall consist of deadfront, completely metal-enclosed vertical sections each containing drawout vacuum circuit breakers and where shown, furnish additional vertical sections containing load interrupter switches and fuses or miscellaneous auxiliary apparatus of the number, rating and type noted on the drawings or specified herein.

B. The following feature shall be supplied on every vertical section containing a drawout vacuum circuit breaker:

C. High voltage parts within circuit breaker compartments shall be isolated with grounded metal barriers.

D. Vertical section construction shall be of the universal frame type using die-formed and bolted parts. All enclosing covers and doors shall be fabricated from steel whose thickness shall be equal to or greater than those specified in ANSI/IEEE C37.20.3. No owner removable hardware for covers or doors shall be thread forming type. To facilitate installation and maintenance of cables and bus in each vertical section, a split removable top cover and hinged, bolted rear door with padlock provisions shall be provided. A high quality G90 grade galvanized base will isolate equipment from contact with the concrete pad providing protection from rust. Heavy-duty hot dipped galvanized anchor clips shall be provided to anchor the switchgear to the concrete pad.

E. Each vertical section shall be ventilated at the top and bottom, both front and rear, to allow airflow to help prevent buildup of moisture within the structure. For dust-resistant or outdoor applications, the ventilated covers shall be externally removable to allow safe maintenance of the filter media without providing access to live parts.

F. Each vertical section containing a switch shall have a single, full-length, flanged front door and shall be equipped with two rotary latch-type padlockable handles. A nameplate shall be mounted on the front door of each vertical section.

2.4 BUS

A. All buses shall be tin-plated copper or silver-plated copper.

B. Ground bus shall be silver-plated copper and be directly fastened to a galvanized metal surface of each vertical section and be of a size sufficient to carry the rated (2-second) current of the switchgear assembly.

C. A neutral bus shall be provided when indicated on the drawings. It shall be insulated for 1000 Vac to ground. The current rating of the neutral bus shall be 600 amperes.

2.5 BUS SUPPORTING SYSTEMS

A. All bus shall be supported utilizing a high strength and high creep, support providing a minimum of 10.5-inch of creep between phases and ground. The molded fins shall be constructed of high track-resistant aramid nylon, silicone

rubber, or cycloaliphatic epoxy.

B. All standoff insulators on the primary switches and fuse mountings shall be glass polyester or cycloaliphatic epoxy

2.6 WIRING/TERMINATIONS

A. One terminal pad per phase shall be provided for attaching Contractor supplied cable terminal lugs for a maximum of two conductors per phase of the sizes indicated on the drawings. Sufficient space shall be allowed for Contractor supplied electrical stress relief termination devices.

B. Small wiring, fuse blocks and terminal blocks within the vertical section shall be furnished as indicated on the drawings. Each control wire shall be labeled with wire markers. Terminal blocks shall be provided for owner connections to other apparatus.

2.7 CIRCUIT BREAKER

A. Each circuit breaker shall be operated by a motor-charged spring stored energy mechanism. The spring may be charged manually in an emergency or during maintenance procedures.

B. Each circuit breaker shall have three (3) vacuum interrupter assemblies that are separately mounted on glass polyester insulators. Each vacuum interrupter shall have a contact wear indicator which does not require any tools to indicate the contact wear. The current transfer from the vacuum interrupter moving stem to the breaker main conductor shall be a non-sliding design. The breaker front panel shall be removable when the compartment door is open for ease of inspection and maintenance of the mechanism.

C. The breakers shall be electrically operated using the same control voltage as other equipment in the Unit Substation as described in related sections of this specification:

   A. [120-] [240-] Vac close and AC Capacitor Trip. OR [48-] [125-] Vdc close, and [48-] [125-] Vdc Trip.

   B. Each breaker shall be complete with control switch and red and green indicating lights to indicate breaker contact position.

D. The control voltage shall be derived from a control power transformer mounted in the switchgear and shall meet the requirements described in section 26 37 13 Microgrid Energy Management System and section 26 11 16 Secondary Unit Substation.

2.8 PROTECTIVE RELAYS

A. The switchgear manufacturer shall furnish and install, in the metal-enclosed switchgear, the quantity, type and rating of protection relays as indicated on the drawings and described hereinafter in this specification and in related specification sections.

B. Microprocessor Three-Phase Protective Relay, providing the following functions at a minimum, as well as any functions needed to support the requirements indicated on the drawings and in related sections of this specification.

   A. Microprocessor-based multi-function overcurrent relay, ANSI device function 51/50, 51/50N, or 51/50G, and 86.

2.9 LOAD INTERRUPTER SWITCHES

A. Each load interrupter switch shall have a manual over-toggle type mechanism that does not require the use of a chain or a cable for operation, and utilizes a heavy-duty coil spring to provide opening and closing action. The speed of opening and closing the switch shall be independent of the operator, and it shall be impossible to tease the switch into any intermediate position.

B. The interrupter switch shall have separate main and break contacts to provide maximum endurance for fault close and load interrupting duty.

C. The interrupter switch shall have insulating barriers between each phase and between the outer phases and the enclosure.

D. A maintenance provision shall be provided for slow closing the switch to check switch-blade engagement and slow opening the switch to check operation of the arc interrupting contacts.

E. For fused switch cubicles, fault protection shall be furnished by fuses with continuous ratings as shown in the contract documents. The fuses shall be RBA expulsion type or approved equivalent with three (3) spare fuse refills for each fused switch.

F. The following features shall be supplied on every vertical section containing a three-pole, two-position open-closed switch or switch and fuse:

    A. The door shall be interlocked with the switch so that:

        a. The switch must be opened before the door can be opened

        b. The door must be closed before the switch can be closed

    B. A minimum 8-inch x 16-inch high-impact viewing window that permits full view of the position of all three switch blades through the closed door. The window shall not be more than 58-inches above the switch pad level to allow ease of inspection

    C. A hinged grounded metal barrier bolted closed in front of every switch to prevent inadvertent contact with any live part, yet allow for a full-view inspection on the switch blade position

    D. Provision for padlocking the switch in the open or closed position

    E. Green OPEN, Red CLOSED switch position indicators with the words “Open” and “Closed” in French, Spanish and English

    F. A hinged cover with rustproof quarter turn nylon latches over the switch operating mechanism to discourage casual tampering

    G. The switch shall be removable as a complete operational component

    H. Provision shall be made for operating the switch and storing the removable handle without opening the full-length door.

2.10 UTILITY METERING

A. Contractor shall coordinate with local electric utility and provide metering section on Substation A that meets the requirements of the local utility. Each utility metering vertical section shall contain provisions for current transformers and voltage transformers as required by the utility. The construction shall conform to the utility company's metering standards. It shall also conform to the general electrical and construction design of the switchgear specified above.

2.11 OWNER METERING

A. Provide owner metering in a breaker or switch structure on a hinged panel to provide safe isolated access to meters and all associated terminal and fuse blocks for maintenance, calibration or testing while the gear is energized.

B. Provide current transformers for each meter. Current transformers shall be wired to shorting-type terminal blocks.

C. Provide voltage transformers including primary and secondary protective devices for metering as shown on the drawings.

D. Microprocessor-Based Metering System.

2.12 TRANSFORMER CONNECTIONS

A. A transformer primary load interrupter switch shall include the following when connecting to an indoor ventilated dry type secondary unit substation transformer, such as VPI, VPE or Cast Coil design

a. Cable or bus bar connection from the load side of the fuse (or load side of an unfused switch) to the HV terminal pad locations of the transformer

b. Include a connection for the ground bar termination to connect the switch enclosure to the transformer enclosure

c. A bus transition section is not required for indoor applications. When the transformer and switch are outdoor, provide a 15” throat with a 5” flange (20” altogether) with flange dimensions to match the dimensions of the transformer flange.

B. A transformer primary load interrupter switch shall include the following when connecting to an indoor or outdoor liquid filled transformer, such as mineral oil, FR3, or silicone filled transformer

a. Cable or bus bar connection from the load side of the fuse (or load side of an unfused switch) to the HV bushing terminal pad on the primary of the transformer.

b. Include a connection for the ground bar to connect the switch enclosure to the transformer enclosure

c. A 20”W bus transition section shall be provided. If outdoor, provide a 15” throat with a 5” flange (20” altogether) with flange dimensions to match the dimensions of the transformer flange.

2.13 ACCESSORIES

A. Furnish, distribution class surge arresters with ratings in accordance with manufacture's recommendations.

2.14 ENCLOSURES

A. Each vertical section shall have a sloped weatherproof roof with labyrinth shaped joints. Use of gasket or caulking to make roof joints weatherproof shall not be permitted. All exterior openings shall be screened to prevent the entrance of small animals and barriered to inhibit the entrance of snow, sand, etc. A minimum of one (1) 250-watt, 120-volt space heater shall be provided in each vertical section. Power for the space heater(s) shall be furnished by a fused control power transformer. The design shall be non-walk-in type.

B. Enclosure shall be Dust Resistant. All ventilated openings shall be filtered to inhibit the ingress of dust. The ventilated covers shall be externally removable to allow safe maintenance of the filter media without providing access to live parts. All

external doors and covers shall be gasketed.

C. Enclosures shall be constructed per IEEE/ANSI C37.20.3 Outdoor specifications. (Meets or Exceeds NEMA 3R.)

2.15 NAMEPLATES

A. A nameplate shall be mounted on the front door of each switch vertical section in accordance with the drawings.

2.16 FINISH

A. Prior to assembly, all enclosing steel shall be thoroughly cleaned and phosphatized. A powder coating shall be applied electrostatically, then fused on by baking in an oven. The coating is to have a thickness of not less than 1.5 mils. The finish shall have the following properties:

Impact resistance (ASTM D-2794)	60 direct/60 indirect
Pencil hardness (ASTM D-3363)	H
Flexibility (ASTM D-522)	Pass 1/8-inch mandrel
Salt spray (ASTM B117-85 [20])	600 hours
Color	ANSI 61 gray

2.17 MISCELLANEOUS DEVICES

A. Communication equipment where indicated on the drawings, shall have the following features and shall be compatible with, and meet the requirements of section 26 37 13 Microgrid Energy Management System.

A. Each breaker or load interrupter switch position (open and closed), where shown, shall be communicated via an addressable relay. This relay shall communicate over a local area network (LAN). The relay shall monitor an auxiliary switch contact that monitors the breaker or switch position and shall be rated for the application. Each relay shall have a unique address so that it is possible to “call up” and “read” each load interrupter switch's position from a host computer.

B. A blown high voltage fuse condition on each set of three fuses shall be monitored by an addressable relay. Any blown fuse operation shall be communicated immediately over a local area network (LAN) via the monitoring addressable relay. Each relay shall have a unique address so that it is possible to “call up” and “read” a fuse blown operation for a set of fuses with the communication system

C. The manufacturer shall wire a LAN within the switchgear to all communication capable devices with the same protocol and wire the LAN to a set of easily accessible terminal blocks

D. Control power for addressable relays shall be as described in section 26 37 13 Microgrid Energy Management System.

2.18 SPECIAL SWITCHGEAR CONFIGURATIONS [NOT USED]

PART 3 EXECUTION

3.1 FACTORY TESTING

A. The following standard factory tests shall be performed on the circuit breaker element provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.

A. Circuit breaker operated over the range of minimum to maximum control voltage

B. Factory setting of contact gap

C. One (1) minute dielectric test per ANSI standards

D. Final inspections and quality checks.

B. The following production test shall be performed on the circuit breaker housing:

A. One (1) minute dielectric test per ANSI standards on primary and secondary circuits

B. Operation of wiring, relays and other devices verified by an operational sequence test

C. Final inspection and quality check.

C. The manufacturer shall provide three (3) certified copies of factory test reports.

3.2 FIELD QUALITY CONTROL

A. The Contractor shall provide three (3) copies of the manufacturer's field startup report.

3.3 INSTALLATION

A. The Contractor shall install all equipment per the manufacturer's recommendations and the contract drawings.

B. All necessary hardware to secure the assembly in place shall be provided by the Contractor.

3.4 FIELD ADJUSTMENTS

A. The relays shall be set in the field by:

A. The Contractor in accordance with settings designated by the Engineer

END OF SECTION

SECTION 26 24 13

SWITCHBOARDS

PART 1 GENERAL

1.1 SUMMARY

A. Scope: Provide labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, configuration and installation for low voltage switchboards (also identified as SWBDs) as required for the complete performance of the Work, as shown on the Drawings, as specified herein.

B. Related Sections: Related sections include, but shall not be limited to, the following:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Applicable general requirements for electrical Work specified within Division 26 Specification Sections apply to this Section.
3. The following SWBD information is typically depicted on the Drawings: bus configuration, bus ratings, interrupting ratings, component size and type, power line and feeder connections, application specific control wiring, elevation and footprint, etc. Where not shown on or able to be derived from the Drawings, the minimum requirements specified herein shall be provided.
4. Section 26 37 13 Microgrid Energy Management System
5. Section 26 11 16 Secondary Unit Substation
6. Section 26 43 13 Surge Protection Devices

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Unit Substations.

1.3 REFERENCES

A. General, Publications: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.

1. ASTM (ASTM):
   a. ASTM E 329, "Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction."
2. Federal Specifications (FS):

a. FS W-C-375, "Circuit Breakers, Molded Case, Branch Circuit and Service."

3. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
   a. ANSI/IEEE C57.13, "Standard Requirements for Instrument Transformers".
4. International Electrical Testing Association (NETA):
   a. NETA ATS, "Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems."
5. International Organization for Standardization (ISO):
   a. ISO 9001, "Quality Management Systems - Requirements."
   b. ISO 14001, “Environmental Management Systems – Requirements”
6. Military Standardization Documents (MIL):
   a. MIL-STD-220, "Method of Insertion Loss Measurement."
7. National Electrical Contractors Association (NECA):
   a. NECA 400, “Standard for Installing and Maintaining Switchboards"
8. National Electrical Manufacturers Association (NEMA):
   a. NEMA EI 21.1, "Instrument Transformers for Revenue Metering (110 kV BIL and Less).”
   b. NEMA KS 1, "Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)"
   c. NEMA PB 2, "Deadfront Distribution Switchboards."
   d. NEMA PB 2.1, "General Instructions for Proper Handling, Installation, Operation and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less."
9. National Fire Protection Association (NFPA):
   a. NFPA 70, "National Electrical Code" (NEC)
   b. NFPA 70B, “Electrical Equipment Maintenance”
   c. NFPA 70E, “Standard for Electrical Safety in the Workplace”
10. Underwriters Laboratories, Inc. (UL):
   a. UL 98, "Standard for Enclosed and Dead-Front Switches"
   b. UL 489, "Standard for Molded-Case Circuit Breakers and Circuit Breaker Enclosures."
   c. UL 891, "Standard for Dead-Front Switchboards"
   d. UL 943, "Standard for Ground-Fault Circuit Interrupters"
   e. UL 1283, “Standard for Safety for Electro-Magnetic Interference Filters"
   f. UL 1449, "Standard for Surge Protective Devices"

1.4 DEFINITIONS

A. Unless specifically defined within the Contract Documents, the words or acronyms contained within this specification shall be as defined within, or by the references listed within this specification, the Contract Documents, or, if not listed by either, by common industry practice.

1.5 SUBMITTALS

A. General: Submittals shall be in accordance with the requirements of Section [01 33 00] Submittals and Section [26 00 10] Electrical Requirements, in addition to those specified herein.

1. Submit sufficient information to determine compliance with the Contract Documents. Identify submittal data with the specific equipment tags and/or service descriptions to which they pertain. Submittal data shall be clearly marked to identify the specific model numbers, options, and features of equipment and work proposed.
2. Submit required product data and shop drawings specific to each product and accessory proposed. In addition, include the following information, including dimensions and manufacturer's technical data on features, performance, ratings and finishes:
    a. Each type of SWBD overcurrent protective device
    b. Surge Protective Devices (SPD)
    c. Ground Fault Protectors
    d. Additional accessories and components indicated herein.
    e. Indicate front and side enclosure elevations with overall dimensions, conduit entrance locations and requirements, nameplate legends, one-line diagrams, equipment schedule and switchboard instrument details.
    f. Submit mimic-bus diagram.
3. Wiring Diagrams: Submit wiring diagrams detailing power, signal, and control systems, clearly differentiating between manufacturer-installed wiring and field-installed wiring, and between components provided by the manufacturer and those provided by others.
4. Quality Control Submittals:
    a. Test Reports: Submit field quality control test reports.

B. Operation & Maintenance (O&M) manuals shall be provided in accordance with the minimum requirements specified in Section [01 78 23] Operation and Maintenance Data, Section [26 00 10] Electrical Requirements and additional requirements specified herein.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of specified products of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of 20 years.

1. The manufacturer shall have a valid ISO 9001 certification and an applicable quality assurance system that is regularly reviewed and audited by a third-party registrar. Manufacturing, inspection, and testing procedures shall be developed and controlled under the guidelines of the quality assurance system.
2. The manufacturer shall have the ISO 14001 Environment Certification and shall supply the Product Environmental Profile (P.E.P.) upon request of the Engineer.

B. Installer Qualifications: Installer shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing switchboards similar in type and scope to that required for this Project.

C. Inspecting and Testing Agency Qualifications: To qualify for acceptance, an independent inspecting and testing agency hired by the Contractor or manufacturer to test products shall demonstrate to the Architect/Engineer's satisfaction that they are qualified according to ASTM E 329 to conduct testing indicated.

D. All work performed and all materials used shall be in accordance with the National Electrical Code, and with applicable local regulations and ordinances. Equipment, assemblies and materials shall be listed and labeled by Underwriter's Laboratories or by a testing agency acceptable to authorities having jurisdiction and marked for intended use.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Prior to delivery to the Project site, ensure that suitable storage space is available to store materials in a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, and corrosive atmospheres. Materials shall be protected during delivery and storage and shall not exceed the manufacturer stated storage requirements. As a minimum, store indoors in clean, dry space with uniform temperature to prevent condensation. In addition, protect electronics from all forms of electrical and magnetic energy that could reasonably cause damage.

B. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and equipment tag number or service name as identified within the Contract Documents.

C. Inspect and report any concealed damage or violation of delivery storage, and handling requirements to the Engineer.

1.8 WARRANTY

A. General: Refer to Section 01 77 00 - Closeout Procedures

B. Surge Protective Devices: Warranty shall be provided by the equipment manufacturer and supported by their respective field services organization, for a period of five years, incorporating unlimited replacement of suppressor parts.

C. Additional Owner Rights: The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

1.9 SPECIAL TOOLS AND SPARE PARTS

A. The Contractor shall provide a recommended spare parts list with the following

information provided as a minimum:

1. Contact information for the closest parts stocking location to the Owner.
2. Critical spare parts shall be identified as those parts being associated with long lead times and/or those being critical to the unit's operation.
3. Maintenance spares shall be identified as being those parts required to regularly perform scheduled maintenance on the furnished equipment. These spares shall include, but shall not be limited to, consumable spares that are required to be exchanged during scheduled maintenance periods.

B. Spare parts shall be provided for each type and size of unit installed. At a minimum, the following shall be provided:
   1. Provide the minimum spare parts recommended by the manufacturer.

C. Any manufacturer specific special tool, not normally found in an electrician's toolbox, required to remove and install recommended or furnished spare parts shall be furnished. At a minimum the following shall be provided:
   1. If available from manufacture, provide PC-based configuration software tool and a minimum of [one] communication interface cable for each type of cable required to connect a PC-based computer to the devices specified herein for configuration and programming.
   2. Electronic configuration files, in a media format acceptable by the Owner (e.g. CD, USB stick, etc.), updated to an as-installed and commissioned state.

D. Spare parts shall be properly marked and packaged for long term storage. Printed circuit boards shall be provided in separate anti-static containers.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Refer to related section 26 37 13 Microgrid Energy Management System.

2.2 General Requirements

A. The following SWBD information is typically depicted on the Drawings: bus configuration, bus ratings, interrupting ratings, component size and type, power line and feeder connections, application specific control wiring, elevation and footprint, etc. Where not shown on or able to be derived from the Drawings, the minimum requirements specified herein shall be provided.

B. Front Accessible Switchboard: Provide main & branch breakers with sections front and rear aligned.

C. Nominal System Voltage: Nominal AC system voltage shall be 480Y/277 volts. If applicable, auxiliary DC systems shall be rated up to 250V.

D. Main bus continuous rating: as shown on drawings

E. Short circuit current ratings: 100 kA

F. Enclosure: Provide steel enclosure, in compliance with UL 891, NEMA Type 3R.

G. Enclosure Finish: Provide factory-applied finish in manufacturer's paint over a rust-inhibiting primer on treated metal surface.

H. Barriers: Provide barriers between adjacent switchboard sections.

I. Insulation and isolation: Provide taped bus for through bus.

J. Strip Heaters: Provide factory-installed electric strip heaters of sufficient wattage in each vertical section to maintain enclosure temperature above expected dew point.

1. Strip Heater Control: Provide [thermostats to maintain temperature of each section above expected dew point][humidistat to control humidity of each section].

2. Strip Heater Power Source: Provide [transformer, factory-installed in switchboard][120 volt external branch circuit].

K. Bussed Auxiliary Section: If required to satisfy design requirements per the drawings, Auxiliary section shall be matched and aligned with basic switchboard.

L. Bus Transition and Incoming Pull Sections: Match and align with basic switchboard.

M. Front Covers and Doors:

1. Front covers shall be screw removable with a single tool.
2. All doors shall be hinged with removable hinge pins.

N. Buses and Connections: Three phase, four wire, unless otherwise indicated. Provide hard-drawn plated copper of 98 percent conductivity.

1. Group-Mounted Feeder Vertical Bus Stack:
   a. Bus stack shall be capable of mounting feeder breakers with different frame sizes and number of poles across from one another on the bus stack.
   b. Non-conducting surface films shall be removed during circuit breaker installation by a wiping action of the circuit breaker jaws.
   c. The design of the circuit breaker jaws and bus stack shall create blow-on forces under fault conditions.
   d. Bolted lap joint connections for feeder breakers shall not be allowed for group-mounted feeders.
2. Ground Bus: Size per current NEC and UL 891 Tables 28.1 and 28.2, hard-drawn copper of 98 percent conductivity, equipped with pressure connectors for feeder and branch circuit ground conductors. For busway feeders, extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.
3. Bus Composition: Tin plated copper. Plating shall be applied continuously to bus work. The switchboard bussing shall be of sufficient cross-sectional area to meet UL 891 temperature rise requirements. The phase and neutral through-bus shall have an ampacity as shown on the Drawings. For four-wire systems, the neutral

shall be of equivalent ampacity as the phase bus bar. Tapered bus is not permitted. Full provisions for the addition of future sections shall be provided. Bussing shall include, but shall not be limited to, necessary hardware to accommodate splicing for future additions.

4. Isolation Barrier Access Provisions: Allows for inspection access to check bus bolt torque values.

O. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit breaker compartment.

P. Switchgear shall be seismic zone 4 and have seismic certification as required by the Authority Having Jurisdiction.

2.3 SURGE PROTECTIVE DEVICES (SPD)

A. Install surge protective devices that meet or exceed the following criteria:

1. Minimum surge current capability (single pulse rated) per phase shall be [240 kA], [].

2. UL 1449 suppression voltage rating, voltage L-N, L-G, N-G, shall be][480Y/277 volts; 600 volts].

B. EMI/RFI filtering shall be minimum -50 dB at 100 kHz with insertion ratio of 50:1 using MIL-STD-220 methodology.

C. Provide with one set of NO/NC dry contacts.

D. Accessories shall include but shall not be limited to, six-digit transient counter set to total transient surges that deviate from the sine wave envelope by more than 125 volts.

2.4 OVERCURRENT PROTECTIVE DEVICES

A. Breaker Type:

1. Molded case circuit breakers

2. Electronic trip, standard and advanced.

3. Current-limiting circuit breakers.

4. GFCI circuit breakers (single-pole and two-pole configurations with 5 mA trip sensitivity).

B. Molded Case Circuit Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Compression style, suitable for number, size, trip ratings, and conductor material.

2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.

3. Ground Fault Protection: Integral to circuit breaker with adjustable pickup and time delay settings, push-to-test feature, and ground fault indicator.
4. Communication Capability: See Section 26 24 13, 2.7 Part C.
5. Shunt Trip: 120 volt trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
6. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1 second to 0.6 second time delay.
7. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts shall mimic circuit breaker contacts, "b" contacts shall operate in reverse of circuit breaker contacts.
8. Key Interlock Kit: Externally mounted to prohibit circuit breaker operation; key shall be removable only when circuit breaker is in off position.
9. Zone Selective Interlocking: Integral with electronic trip unit; for interlocking ground fault protection function.
10. All molded case circuit breakers shall be capable of being permanently locked open (lock-out tag-out).

C. Enclosed, Insulated Case Circuit Breaker: Fully rated, encased power circuit breaker with interrupting capacity rating to meet available fault current.
1. Mounting: Drawout circuit breaker mounting.
2. Closing: Two-step, stored energy closing.
3. Trip Units: Microprocessor-based trip units with interchangeable rating plug, LED trip indicators, and the following field-adjustable settings:
a. Instantaneous trip.
b. Long-time and short-time pickup levels.
c. Long-time and short-time time adjustments with I2t response.
d. Ground fault pickup level, time delay, and I2t response.
4. Remote: Remote trip indication and control.
5. Communication Capability: See Section
6. Key Interlock Kit: Externally mounted to prohibit circuit breaker operation; key shall be removable only when circuit breaker is in off position.
7. Zone Selective Interlocking: Integral with electronic trip unit; for interlocking ground fault protection function.
8. Control Voltage: 125 volts dc.
9. All circuit breakers shall be capable of being permanently locked open (lock-out tag-out).

D. Bolted Pressure Contact Switch: Operating mechanism shall use rotary mechanical bolting action to produce and maintain high clamping pressure on the switch blade after it engages the stationary contacts.

E. Fused Switch: NEMA KS 1, Type HD; shall clip to accommodate specified fuses; lockable handle.

F. Fuses: Fuses are specified in Section 26 28 13 - FUSES

2.5 CONTROL POWER

A. Control Circuits: 120 volts, supplied through secondary disconnecting devices from control power transformer.

2.6 ACCESSORIES

A. Provide accessory set, including, but not limited to, tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

B. Provide one remote racking device for drawout circuit breakers.

C. Provide portable test set to test functions of solid state trip devices without removal from switchboard. Include relay and meter test plugs suitable for testing switchboard meters and switchboard class relays.

D. Provide one portable, floor-supported, roller-based, elevating carriage arranged for movement of circuit breakers in and out of compartments for present and future circuit breakers.

E. Provide overhead circuit breaker lifting device, mounted at top front of switchboard, with hoist and lifting yokes matching each drawout circuit breaker.

F. Provide spare fuse cabinet, suitably identified, wall-mounted, lockable, compartmented steel box or cabinet. Arrange for wall mounting.

2.7 POWER Metering

A. Provide a power meter for each application as described in section 26 37 13 Microgrid Energy Management System.

B. Instrument Transformers: NEMA EI 21.1, ANSI/IEEE C57.13, and the following:

1. Potential Transformers: Secondary voltage rating of 120 volts and NEMA accuracy class of 0.3 with burdens of W, X, and Y.
2. Current Transformers: Ratios shall be as indicated with accuracy class and burden suitable for connected relays, meters, and instruments.
3. Control Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kV.
4. Current Transformers for Neutral and Ground Fault Current Sensing: Connect secondaries to ground overcurrent relays to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit breaker ground fault protection.

2.8 COMMUNICATIONS

A. Switchgear/switchboard lineup shall include communications capabilities as specified in

section 26 37 13 Microgrid Energy Management System.

2.9 ELECTRICAL POWER MANAGEMENT SYSTEM [Not Used]

2.10 SWITCHBOARD LIGHTING

Provide convenience lights inside cabinet. Lights should be activated when weatherproof door is opened and shall provide illumination of equipment on switchboard.

2.11 MARKINGS AND LABELING

A. All identification and warning labels and nameplates exterior to the SWBD shall be resistant to weather, UV and their intended installation environment.

B. Each SWBD shall be provided with an engraved nameplate identifying the project specific equipment tag and service description.

C. Warning labels and nameplates shall be present at access locations to advise personnel of possible hazards. The SWBD shall be marked in accordance with UL, NFPA 70 NEC, NFPA 70E, and other applicable standards.

D. Mimic Bus: Provide an anodized aluminum or plastic engraved plaque. Arrange in single-line diagram format, using symbols and letter designations consistent with final mimic bus diagram. Produce a concise visual presentation of principal switchboard components and connections.

PART 3 - EXECUTION

3.1 GENERAL

A. In addition to the requirements specified herein, execution shall be in accordance with the requirements of Specification Section 26 00 10 and Drawings.

B. Examine equipment exterior and interior prior to installation. Report any damage and do not install any equipment that is structurally, moisture, or mildew damaged.

C. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Engineer, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

D. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

E. Install equipment in accordance with reviewed product data, final shop drawings, manufacturer's written instructions and recommendations, and as indicated on the Drawings.

F. Functional testing, commissioning, and first parameter adjusting shall be carried out by a factory trained manufacturer's representative field service engineer. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment. Report to the Engineer any discrepancies or issues with the installation.

G. Provide final protection and maintain conditions in a manner acceptable to the manufacturer that shall help ensure that the equipment is without damage at time of Substantial Completion.

3.2 INSTALLATION

A. Pre-Installation Conference: Conduct pre-installation conference. Prior to commencing the installation, meet at the Project site to review the material selections, installation procedures, and coordination with other trades. Pre-installation conference shall include, but shall not be limited to, the Contractor, the Installer, and any trade that requires coordination with the work. Date and time of the pre-installation conference shall be acceptable to the Owner and the Engineer.

B. Install switchboards and accessories according to NEMA PB 2.1 and NECA 400.

C. Install and anchor switchboards level on concrete bases, [4 inch (102 mm)] nominal thickness. Concrete base is specified in specification [Section 26 05 29 Hangers and Supports for Electrical Systems][Section 16050 Basic Electrical Materials And Methods], and concrete materials and installation requirements are specified in Division 03 - Concrete.

D. Frame and mount the printed basic operating instructions for switchboards, including, but not limited to, control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.

E. Adjust circuit breaker trip and time delay settings to values indicated within coordination study or as instructed by the Engineer.

F. Measure, using a Megger, the insulation resistance of each bus structure phase-to-phase and phase-to-ground for one minute each, at minimum test voltage of 1000 Vdc; minimum acceptable value for insulation resistance is 1 megohms. Refer to manufacturer's literature for specific testing procedures.

G. Physically test key interlock systems to check for proper functionality prior to energizing.

3.3 TRAINING [NOT USED]

3.4 TESTING AND COMMISSIONING

A. Switchboard and related equipment shall be commissioned and tested as a system for conformance to specification requirements prior to scheduling the acceptance tests. Contractor shall conduct performance verification tests in the presence of Owner's representative, observing and documenting complete compliance of the system to the specifications. Contractor shall submit a signed copy of the test results, certifying proper system operation before scheduling tests.

1. Test insulation resistance for each switchboard bus, component, connecting

supply, feeder, and control circuit.

2. Test continuity of each circuit.
3. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Sections 7.1, 7.5, 7.6, 7.9, 7.10, 7.11, and 7.14 as appropriate. Certify compliance with test parameters.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install panelboards.

B. Related Sections:
1. Section 26 05 05, General Provisions for Electrical Systems.
2. Section 26 05 53, Identification for Electrical Systems.
3. Section 26 22 00, Low Voltage Transformers
4. Section 26 43 13, Surge Protective Devices.

1.2 MEASUREMENT AND PAYMENT

1. Panelboards indicated on drawings as part of a unit substation shall be included in lump sum cost for Unit Substations.
2. Any panelboards not indicated on drawings as part of a unit substation shall be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. Standards referenced in this Section are:
1. NEMA PB 1, Panelboards.
2. NETA, InterNational Electrical Testing Association
3. UL 67, Panelboards.

1.4 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.5 SUBMITTALS

A. Action Submittals. Submit the following:
1. Product Data
a. Panelboards - Product Data
1) Submit technical information for panelboards proposed for use,

including product literature and specifications. Indicate options and features to be provided.

2. Shop Drawings
    a. Listing of Panelboards and Proposed Locations
        1) Listing of panelboards to be furnished with identification of their proposed location, and all electrical characteristics, including number and rating of branch circuit breakers and enclosure type.
        2) Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device.
        3) Include evidence of NRTL listing for series rating of installed devices.
        4) Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
        5) Include wiring diagrams for power, signal, and control wiring.
        6) Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
        7) Detail enclosure types and details for types other than NEMA 250, Type 1.
        8) Detail bus configuration, current, and voltage ratings.
        9) Short-circuit current rating of panelboards and overcurrent protective devices.
    b. Panelboard Schedule
        1) For installation in panelboards. Submit final versions after load balancing.
3. Samples (NOT USED)
4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:
1. Certificates (NOT USED)
2. Test and Evaluation Reports (NOT USED)
3. Manufacturers' Instructions (NOT USED)
4. Source Quality Control Submittals (NOT USED)
5. Field Quality Control Submittals
    a. Panelboards Testing Plan, Procedures and Results
        1) Submit test procedures used.
        2) Submit test results that comply with requirements.
        3) Include results of failed tests and corrective action taken to achieve test results that comply with requirements.
6. Qualifications Statements (NOT USED)
7. Manufacturer Reports (NOT USED)
8. Sustainable Design Submittals (NOT USED)
9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. Submit the following:
1. Operation and Maintenance Data
    a. Panelboard - Operation and Maintenance Data
        1) Operation, and maintenance manuals for panelboards and components to include in emergency.
        2) Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

3) Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

2. Record Documentation
   a. Panelboard Record Documentation
      1) Provide an electronic modifiable copy of each updated and/or new panel board schedule with date of change(s).
      2) Submit final versions after load balancing.
3. Training Material (NOT USED)
4. Warranty Documentation (NOT USED)
5. Software (NOT USED)
6. Bonds (NOT USED)
7. Maintenance Contracts (NOT USED)
8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. Submit the following:
   1. Spare Parts
      a. Fuses for Fused Power-Circuit Devices:
         1) 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
   2. Extra Stock Materials (NOT USED)
   3. Tools (NOT USED)

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.

B. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

C. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

D. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Regulatory Requirements; Comply with the following:
   1. NEC Article 408, Switchboards and Panelboards.
   2. Comply with NEMA PB 1.
   3. Comply with NFPA 70.

1.7 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling, and Unloading:
   1. Packing:
      a. Inspect prior to packing to assure that assemblies and components are complete and undamaged.
      b. Protect mating connections.

c. Cover all openings into enclosures with-vapor inhibiting, water-repellent material.

2. Deliver materials and equipment to Site to ensure uninterrupted progress of the Work. Deliver anchorage materials to be embedded in concrete in ample time to prevent delaying the Work. Upon deliver, check materials and equipment for evidence of water that may have entered equipment during transit.
3. Comply with Section 01 65 00, Product Delivery Requirements.

B. Storage and Protection:
1. Store panelboards in a clean, dry location with controls for uniform temperature and humidity. Protect equipment with coverings and maintain environmental controls.
2. Comply with Section 01 66 00, Product Storage and Handling Requirements.

1.8 FIELD CONDITIONS

A. Environmental Limitations:
1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
a. Ambient Temperature: Not exceeding [minus 22 deg F (minus 30 deg C)] to plus 104 deg F (plus 40 deg C).
3. Altitude: Not exceeding 6600 feet (2000 m).

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:
1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet (2000 m).

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
1. Notify Engineer no fewer than 14 days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Engineer's written permission.
3. Comply with NFPA 70E.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.

PART 2 PRODUCTS

2.1 MANUFACTURERS

1. Provide products of one of the following:
   a. Cutler-Hammer (Eaton).
   b. Siemens.
   c. Square D (Schneider Electric).

2.2 MATERIALS

A. Panelboards:

1. Rating: Voltage rating, current rating, number of phases, number of wires and number of poles as shown or indicated on the Drawings.
2. Circuit Breakers: Molded case, bolt-in thermal magnetic type with number of poles and trip ratings as shown or indicated. Where indicated on the Drawings, circuit breakers shall be ground fault circuit interrupting type equipped with solid state sensing and five-milliamp sensitivity.
3. Circuit breakers for 480-volt panelboards shall have minimum interrupting rating of 14,000 ampere RMS symmetrical, unless otherwise indicated on the Drawings. Circuit breakers for other panelboards shall have minimum interrupting rating of 10,000 ampere RMS symmetrical, unless otherwise indicated on the Drawings.
4. Bus Bars: Bus bars shall be 98 percent conductivity copper. Four-wire panelboards shall have solid neutral bar. Each panel shall have ground bus bar.
5. Main: Panelboards shall have main circuit breaker, unless the Drawings specifically indicate main lugs only.
6. Connect branch circuit breakers for sequence phasing.
7. Enclosures: Panel enclosures shall be as required for the area classifications indicated in Section 26 05 05, General Provisions for Electrical Systems, unless otherwise indicated on the Drawings.
8. Construction: Code-grade steel, ample gutter space, flush door, flush snap latch and lock. Panelboards shall comply with NEMA PB 1 and UL 67.
9. Trim: Surface or flush as required. Provide Door-In-Door Construction.
10. Directory: Typed or computer-printed card, with transparent protective cover in frame on back of door giving circuit numbers and area or equipment served.
11. Identification: Identify panelboards in accordance with Section 26 05 53, Identification for Electrical Systems. Identification shall indicate panel number and voltage.
12. Directory of Existing Panelboards: When adding or removing breakers or loads from existing panelboards, provide a new typed or computer-generated directory card, indicating the circuit numbers and equipment served.
13. Provide surge protective device in accordance with Section 26 43 00, Surge Protective Devices, for each panelboard shown or indicated on the Drawings. Surge protective device shall be included and factory-mounted within panelboard by panelboard manufacturer. Surge protective device monitoring and display shall be visible from front of panelboard.
14. Front: Secured to box with concealed trim clamps, unless otherwise indicated. Front for surface-mounted panelboards shall be same dimensions as box. Fronts for flush panelboards shall overlap box, unless otherwise indicated.
15. Main and Neutral Lugs: Compression type.
16. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.
17. Service Equipment Approval: Listed for use as service equipment for

panelboards with main service disconnect.

18. Future Devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for overcurrent protective device ampere ratings indicated for future installation of devices.
19. Special Features: Include following features for panelboards as indicated:
    a. Isolated Equipment Ground Bus: Adequate for branch-circuit equipment ground conductors; insulated from box.
20. Extra Gutter Space: Dimensions and arrangement as indicated.
    a. Subfeed: Overcurrent protective device or lug provision as indicated.
21. Feed-through Lugs: Sized to accommodate feeders indicated.

B. Integrated Panelboard and Transformer:
    1. Products and Manufacturers: Provide products of one of the following:
        a. Mini-Power Center by Cutler-Hammer (Eaton).
        b. Integrated Power Systems by Siemens.
        c. Mini-Power Zone by Square D (Schneider Electric).
    2. General: Unit shall consist of encapsulated dry-type transformer, primary and secondary main circuit breakers, and secondary panelboard all in one enclosure.
    3. Transformer Rating: Transformer portion shall comply with Section 26 22 14, Dry-type Low-Voltage Distribution Transformers. KVA, primary voltage, secondary voltage, frequency and number of phases shall be as shown or indicated on the Drawings.
    4. Branch Circuits: Molded case circuit breakers, plug-in thermal magnetic type with number of poles and trip ratings as shown or indicated on the Drawings.
    5. Enclosure: Enclosures shall be as required for the area classifications indicated in Section 26 05 05, General Provisions for Electrical Systems, unless otherwise indicated on the Drawings.

2.3 BRANCH CIRCUIT OR DISTRIBUTION PANELBOARDS

A. Doors: Door-In Door type panelboard front, with concealed hinges. Secure with flush catch and tumbler lock, keyed alike.

B. Branch-Circuit Breakers: Where overcurrent protective devices are indicated to be circuit breakers, use bolt-on circuit breakers, except circuit breakers 225-A frame size and greater may be plug-in type where individual positive-locking device requires mechanical release for removal.

2.4 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable.
    1. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting capacity rating to meet available fault current.
    2. Circuit Breakers, 200 A and Larger: Trip units interchangeable within frame size.
    3. Circuit Breakers, 400 A and Larger: Field-adjustable short-time and continuous current settings.
    4. Current-Limiting Trips: Where indicated, let-through ratings less than NEMA FU 1, Class RK-5.
    5. Current Limiters: Where indicated, integral fuse listed for circuit breaker.
    6. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.
    7. Shunt Trip: Where indicated.

2.5 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Include tools and miscellaneous items as required for overcurrent protective device test, inspection, maintenance, and operation.

B. Portable Test Set: Arranged to permit testing of functions of solid-state trip devices without removal from panelboard.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine conditions under which the Work is to be installed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

B. Receive, inspect, handle, and store panelboards according to NECA 407 and NEMA PB 1.1.

C. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

3.2 INSTALLATION

A. Identify panelboards in accordance with Section 26 05 53, Identification for Electrical Systems.

B. Install panelboards and accessory items according to NEMA PB 1.1.

C. Mounting Heights: Top of trim 74 in. (1880 mm) above finished floor, unless otherwise indicated.

D. Mounting: Plumb and rigid without distortion of box. Mount flush panelboards uniformly flush with wall finish.

E. Circuit Directory: Type directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing.

F. Install filler plates in unused spaces.

G. Provision for Future Circuits at Flush Panelboards: Stub four 1 in. (27 mm) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in future. Stub four 1 in. (27 mm) empty conduits into raised floor space or below slab not on grade.

H. Wiring in Panelboard Gutters: Arrange conductors into groups, and bundle and wrap with wire ties after completing load balancing.

3.3 GROUNDING

A. Make equipment grounding connections for panelboards.

B. Provide ground continuity to main electrical ground bus.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Acceptance Testing Preparation:
   1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
   2. Test continuity of each circuit.

E. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

F. Panelboards will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

A. Set field-adjustable pick-up and time-sensitivity ranges in accordance with Section 26 05 73.

3.7 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove

paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION

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SECTION 26 27 26

WIRING DEVICES

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install wiring devices.
2. Section includes:
a. Straight-blade Devices, 125 V, 20 A.
b. GFCI Receptacles, 125 V, 20A.
c. Pendant Cord-Connector Devices.
d. Cord and plug sets.
e. Toggle switches, 120/277 V, 20 A.
f. Wall plates.

B. Coordination:
1. Review installation procedures under other Sections and coordinate installation of items to be installed with or before Wiring Devices.

C. Related Sections:
1. Section 26 05 05, General Provisions for Electrical Systems.
2. Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables.
3. Section 26 05 26, Grounding and Bonding for Electrical Systems.
4. Section 26 05 33, Raceways and Boxes for Electrical Systems.
5. Section 26 05 53, Identification for Electrical Systems.

1.2 MEASUREMENT AND PAYMENT
1. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. Definitions referenced in this Section are:
1. Abbreviations of Manufacturers' Names:
a. Eaton: Eaton; Arrow-Hart Wiring Devices.
b. Hubbell: Hubbell Incorporated; Hubbell Wiring Devices-Kellems.
c. Leviton: Leviton Mfg. Company, Inc.
d. P & S: Pass & Seymour/Legrand.

B. Standards referenced in this Section are:
1. FS – Federal Specifications:
a. FS WC-596, Electrical Power Connector, Plug, Receptacle, and Cable Outlet.
b. FS W-S-896-E, Switch, Toggle
2. UL 498, Standard for Attachment Plugs and Receptacles

3. ULK 1682, Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type
4. NEMA WD 1, General Color Requirements for Wiring Devices.
5. NEMA OS 3, Selection and Installation Guidelines for Electrical Outlet Boxes.
6. NEMA WD 6, Wiring Devices – Dimensional Requirements.
7. NEMA FB 11, Plugs, Receptacles and Connectors of the Pin and Sleeve Type for Hazardous Locations.
8. NFPA 70, National Electrical Code.

1.4 DEFINITIONS

A. Definitions referenced in this Section are:
1. BAS: Building automation system.
2. EMI: Electromagnetic interference.
3. GFCI: Ground-fault circuit interrupter.
4. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
5. RFI: Radio-frequency interference.
6. SPD: Surge protective device.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:
1. Product Data
a. Wiring Devices - Product Data
1) For each type of product.
2. Shop Drawings (NOT USED)
3. Samples (NOT USED)
4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:
1. Certificates (NOT USED)
2. Test and Evaluation Reports
a. Wiring Devices – Test and Evaluation Reports
1) Results of required Test and Evaluation Reports.
3. Manufacturers' Instructions (NOT USED)
4. Source Quality Control Submittals (NOT USED)
5. Field Quality Control Submittals (NOT USED)
6. Qualifications Statements (NOT USED)
7. Manufacturer Reports (NOT USED)
8. Sustainable Design Submittals (NOT USED)
9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. Submit the following:
1. Operation and Maintenance Data:
a. Wiring Devices - Operation and Maintenance Data
1) Submit complete installation, operation and maintenance manuals including all manufacturer's packing-label warnings and instruction manuals that include labeling conditions.
2. Record Documentation (NOT USED)
3. Training Material (NOT USED)
4. Warranty Documentation (NOT USED)

5. Software (NOT USED)
6. Bonds (NOT USED)
7. Maintenance Contracts (NOT USED)
8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. (NOT USED)
1. Spare Parts (NOT USED)
2. Extra Stock Materials (NOT USED)
3. Tools (NOT USED)

1.6 QUALITY ASSURANCE

A. Regulatory Requirements:
1. National Electrical Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.

B. Manufacturer:
1. Manufacturer shall have not less than five years of experience producing substantially similar equipment to that required and, upon request, shall submit documentation of not less than five installations in satisfactory operation for not less than five years in the United States.
2. Wiring Devices and Wall Plates shall be product of a single manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in unopened cartons or bundles as appropriate, clearly identified with manufacturer's name, Underwriter's or other approved label, grade or identifying number.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

PART 2 –PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by the following:
1. Eaton
2. Hubbell
3. Leviton
4. P & S

B. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in

NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with NEMA WD 1.

D. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
   1. Connectors shall comply with UL 2459 and shall be made with stranded building wire.
   2. Devices shall comply with the requirements of this Section.

E. Devices for Owner-Furnished Equipment:
   1. Receptacles: Match plug configurations.
   2. Cord and Plug Sets: Match equipment requirements.

2.3 STRAIGHT-BLADE DEVICES, 125 V, 20A

A. Duplex Receptacles: 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Eaton: AH5351 (single), AH5352 (duplex).
      b. Hubbell: HBL5351 (single), HBL5352 (duplex).
      c. Leviton: 5361 (single), 5352 (duplex).
      d. P & S: 5361 (single), 5362 (duplex).

2.4 GFCI RECEPTACLES, 125 V, 20 A

A. General Description for dry location:
   1. 125 V, 20 A, straight blade, feed-through type.
   2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
   3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
      a. Eaton: SGF20.
      b. Hubbell: GF20.
      c. Leviton: G5362.
      d. P & S: 2097TR

B. General Description for wet location:
   1. 125 V, 20 A, straight blade, feed-through type, weather-proof.
   2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
   3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
      a. Eaton: WRSGF20.
      b. Hubbell: GFTR20.
      c. Leviton: G5362-WT
      d. P & S: 2097TRWR

2.5 PENDANT CORD-CONNECTOR DEVICES

A. Description:
   1. Matching, locking type plug and receptacle body connector, heavy-duty grade.
   2. Configuration: NEMA WD6, type L5-20P and L5-20R.
   3. Body: Nylon with screw-open, cable-gripping jaws and provision for attaching external cable grip.
   4. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.
   5. Standards: Comply with FS W-C-596.

B. Use GFCI type circuit breaker for GFCI applications.

2.6 CORD AND PLUG SETS

A. Description:
   1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
   2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.
   3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

B. Use GFCI type circuit breaker for GFCI applications.

2.7 TOGGLE SWITCHES, 120/277 V, 20A

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:
   1. Single Pole:
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Eaton: AH1221.
         2) Hubbell: HBL1221.
         3) Leviton: 1221-S.
         4) P & S: PS20AC1.
   2. Three Way:
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Eaton: AH1223.
         2) Hubbell: HBL1223.
         3) Levition: 1223-S.
         4) P & S: PS20AC3.
   3. Four Way:
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Eaton: AH1224.
         2) Hubbell: HBL1224.
         3) Leviton: 1224-S.
         4) P & S: PS20AC4.
   4. Lighted Toggle:

a. Products: Subject to compliance with requirements, provide one of the following:
   1) Eaton: AH1221LTW (SP), AH1223LTW (3-Way)
   2) Hubbell: HBL1221IL (SP), HBL1223IL (3-Way)
   3) Leviton: 1221-LH (SP), 1223-LH (3-Way)
   4) P & S: PS20AC1SL (SP), SP20AC3SL (3-Way)
b. Pilot Light (Red):
   1) Eaton: AH1221PL (SP), AH1223PL (3-Way), AH1224PL (4-Way)
   2) Hubbell: HBL1221PL (SP), HBL1223PL (3-Way)
   3) Leviton: 1221-PL (SP), 1223-PL (3-Way)
   4) P & S: PS20AC1PL (SP), PS20AC3PL (3-Way)

2.8 WALL-BOX DIMMERS

A. Audible frequency and EMI/RFI suppression filters.

B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.

C. LED Lamp Dimmer Switches: Modular; compatible with LED lamps and drivers; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 10 percent of full brightness.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Eaton:SF10P.
      b. Leviton: IP710-LFZ.
      c. Lutron: DVSTV (Diva Series)
      d. P & S: CD4FBL3P (Titan Series).

2.9 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.
   1. Plate-Securing Screws: Metal with head color to match plate finish.
   2. Material for Finished Spaces: 0.035-inch-thick, satin-finished, Type 302 stainless steel.
   3. Material for Damp Locations: Cast aluminum with spring-loaded lift cover and listed and labeled for use in wet and damp locations.
   4. Material for areas classified as hazardous locations: Where required by NEC, shall be NEMA 7 explosion-proof and comply with UL 886.
   5. In corrosive locations, where the conduit system is PVC-coated, wall plates shall be Type 316 stainless steel, or non-metallic thermoplastic or fiberglass reinforced plastic material.

2.10 EXTERIOR WALL COVER PLATES

A. Single and combination types shall be as follows:
   1. All exterior device cover plates shall be while-in-use style.
   2. All exterior device cover plates shall be cast aluminum.
   3. Manufacturers and model shall be as follows:
      a. Single Gang Horizontal Mount:
         1) Hubbell: WP26EH.
         2) Leviton: IUM1H-GY.

3) P & S: WIUCAST1.
b. Single Gang Horizontal Mount:
1) Hubbell: WP26E.
2) Leviton: IUM1V-GY.
3) P & S: WIUCAST1.
c. Double Gang Mount:
1) Hubbell: WP262E.
2) Leviton: IUM2V-GY.
3) P & S: WIUCAST2.

2.11 FINISHES

A. Device Color:
1. Wiring Devices Connected to Normal Power System: As selected by Engineer unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Emergency Power System: Red.

B. Wall Plate Color: For plastic covers, match device color.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:
1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:
1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
a. Cut back and pigtail or replace all damaged conductors.
b. Straighten conductors that remain and remove corrosion and foreign matter.
c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:
   1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
   2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
   3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
   4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
   5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
   6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
   7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
   8. Tighten unused terminal screws on the device.
   9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:
   1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:
   1. Install dimmers within terms of their listing.
   2. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 26 0553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and

durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Perform the following tests and inspections:
   1. Test Instruments: Use instruments that comply with UL 1436.
   2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

D. Tests for Convenience Receptacles:
   1. Line Voltage: Acceptable range is 105 to 132 V.
   2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
   3. Ground Impedance: Values of up to 2 ohms are acceptable.
   4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
   5. Using the test plug, verify that the device and its outlet box are securely mounted.
   6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

E. Wiring device will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION

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SECTION 26 28 16

ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Nonfusible switches.
2. Enclosures.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each type of enclosed switch, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
2. Enclosure types and details for types other than UL 50E, Type 1.
3. Current and voltage ratings.
4. Short-circuit current ratings (interrupting and withstand, as appropriate).

B. Shop Drawings: For enclosed switches.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

C. Field Quality-Control Submittals:

1. Field quality-control reports.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

B. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

2.2 NONFUSIBLE SWITCHES

A. Type HD, Heavy Duty, Three Pole, Single Throw, 600 V(ac), 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

B. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

2.3 ENCLOSURES

A. Enclosed Switches: UL 489, NEMA KS 1, UL 50E, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: Enclosure must be finished gray baked enamel paint, electrodeposited on cleaned, phosphatized galvannealed steel (UL 50E Type 3R).

C. Operating Mechanism: Operating handle must be externally operable with operating mechanism being integral part of box, not cover. Cover interlock mechanism must have externally operated override. Override may not permanently disable interlock mechanism, which must return to locked position once override is released. Tool used to override cover interlock mechanism must not be required to enter enclosure in order to override interlock.

PART 3 - EXECUTION

3.1 SELECTION OF ENCLOSURES

A. Outdoor Locations: UL 50E, Type 3R.

3.2 INSTALLATION

A. Comply with manufacturer's published instructions.

B. Special Techniques:

1. Coordinate layout and installation of switches and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
2. Install individual wall-mounted switches with tops at uniform height unless otherwise indicated.

3.3 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections for Switches:

1. Visual and Mechanical Inspection:

a. Inspect physical and mechanical condition.
b. Inspect anchorage, alignment, grounding, and clearances.
c. Verify that unit is clean.
d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
e. Verify that fuse sizes and types match the Specifications and Drawings.
f. Verify that each fuse has adequate mechanical support and contact integrity.
g. Inspect bolted electrical connections for high resistance using one of the following methods:

1) Use low-resistance ohmmeter.

a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of lowest value.

2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

a) Bolt-torque levels must be in accordance with manufacturer's published data. In absence of manufacturer's published data, use NETA ATS Table 100.12.

h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on Drawings.
i. Verify correct phase barrier installation.
j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

B. Nonconforming Work:

1. Enclosed switches will be considered defective if they do not pass tests and inspections.

2. Remove and replace defective units and retest.

C. Collect, assemble, and submit test and inspection reports.

1. Test procedures used.
2. Include identification of each enclosed switch tested and describe test results.
3. List deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION

SECTION 26 31 00

PHOTOVOLTAIC SYSTEM

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions under Notice to Bidders and Special Provisions, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Performance Requirements
2. PV System Description
3. PV Modules
4. PV Inverters
5. PV Wire
6. PV Module Framing
7. PV Array Construction
8. System Overcurrent Protection.

B. Related Requirements and Sections:
1. Notice to Bidders and Special Provisions for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. 260505 General Provisions for Electrical Systems
3. 260519 Low-Voltage Electrical Power Conductors and Cables
4. 260526 Grounding and Bonding for Electrical Systems

1.3 DEFINITIONS

A. ETFE: Ethylene tetrafluoroethylene.

B. FEP: Fluorinated ethylene propylene.

C. IP Code: Required ingress protection to comply with IEC 60529.

D. MPPT: Maximum power point tracking.

E. PV: Photovoltaic.

F. PVUSA: Photovoltaics for Utility Systems Applications.

G. STC: Standard Test Conditions defined in IEC 61215.

1.4 SUBMITTALS

A. Product Submittals: Product submittals shall be provided with manufacturer's current data for submitted product. All non-applicable data shall be crossed out with a red ‘X'

1. PV Module: All electrical characteristics, mechanical specifications, dimensions, 3rd party listings / certificates, temperature coefficients and physical dimensions.

2. Inverter: All electrical characteristics, mechanical specifications, dimensions, 3rd party listings / certificates, temperature coefficients and physical dimensions.

3. DC Optimizer: All electrical characteristics, mechanical specifications, dimensions, 3rd party listings / certificates and physical dimensions.

4. PV Cable: All electrical characteristics, mechanical specifications, dimensions, 3rd party listings / certificates.

5. PV Support System: All physical components of system, 3rd party listings / certificates and physical dimensions.

B. Coordination Drawings: Provide ANSI D size (34” x 22”) coordination drawings showing all components of system along with all other planned structural, architectural, electrical and equipment. Include dimensioned plan views and sections indicating locations of system components, required clearances, attachment locations and details, and proposed size, type, and routing of conduits and cables. Include system interconnection schematic diagrams showing all factory and field connections.

C. Design Data: Include stamped structural drawings and calculations, certified by a structural engineer licensed in the state of California, for PV mounting and attachment systems.

D. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.

E. Informational Submittals (Not for Approval):

1. Field Quality Control Reports

2. Commissioning Report: Sample inspection and commissioning procedure.

F. Warranty:

1. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of PV system components (modules, inverters, DC optimizers and other appurtenances) that fail in materials or workmanship within specified warranty period.

a. Manufacturer's materials and workmanship warranties include, but are not limited to, the following:

1) PV modules

2) Inverter

3) DC Optimizers

b. Warranty Period: Twelve (12) years from date of Substantial Completion.

2. Manufacturer's Special Minimum Power Output Warranty: Manufacturer agrees to repair or replace components of PV modules that fail to exhibit the minimum power output within specified warranty period. Special warranty, applying to modules only, applies to materials only, on a prorated basis, for period specified.

a. Manufacturer's minimum power output warranties include, but are not limited to, the following warranty periods, from date of Substantial Completion:

1) Specified minimum power output to 80 percent or more, for a period of 25 years.

1.5 COMMISSIONING

A. Third-Party commissioning agent shall be contracted to provide independent commissioning of the PV system. Commissioning agent shall be NABCEP (or equivalent) accreditation for commissioning of PV systems.

1.6 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of PV system components (modules, inverters, DC optimizers and other appurtenances) that fail in materials or workmanship within specified warranty period.

1. Manufacturer's materials and workmanship warranties include, but are not limited to, the following:

a. PV modules

b. Inverter

c. DC Optimizers

2. Warranty Period: Twelve (12) years from date of Substantial Completion.

3. Manufacturer's Special Minimum Power Output Warranty: Manufacturer agrees to repair or replace components of PV modules that fail to exhibit the minimum power output within specified warranty period. Special warranty, applying to modules only, applies to materials only, on a prorated basis, for period specified.

a. Specified minimum power output to 80 percent or more, for a period of 25 years.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a nationally recognized testing lab (NRTL), and marked for intended location and application.

B. Seismic Qualification Certificates: For PV modules, PV rails, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

2.2 PV SYSTEMS DESCRIPTION

A. Overview: PV System: Rooftop photovoltaic array mounted to a modular PV rail system. This PV rail system shall be connected to structural framing utilizing compatible connection hardware. The PV system shall consist of PV Modules, SolarEdge P860 Optimizers, SolarEdge 100kW String Inverters and associated appurtenances to comprise of approximately a 215kW DC photovoltaic system.

B. PV system connected in parallel to the electrical utility (utility-interactive); and capable of providing power for Project and supplying power to a distributed network.

1. A multi -module array to generate a total nominal rated output of 215kW.

2. System Components:

a. Mounting Structure

b. PV modules.

c. DC Optimizers

d. Inverter

2.3 PV MODULES

A. Accepted Manufacturers:

1. Hanwha Q.PEAK L-G4.3 425 (425W),

2. LG 415N2T

3. Or Approved Equal

B. PV Panel Optimizers:

1. Solaredge P860

2.4 PV INVERTER

A. Inverter Type: SolarEDGE SE100KUS

2.5 PV ARRAY CONSTRUCTION

A. PV Rails:

1. Manufacturers: UniRAC, Iron Ridge, QRail Tilt

2. Overview: extruded aluminum structure utilized for attachment of PV modules. Extruded structure shall have slotted entries for module attachment hardware and for wire management systems.

3. PV mounting system shall attach to the existing structural steel canopy. Provide additional structural steel as required to support selected PV mounting system. The contractor shall be responsible to design, furnish, and install a suitable attachment system based on the selected PV mounting system manufacturer's requirements.

4. Module array tilt: 5 degrees (South)

5. Wire Management Systems: Modular attachments integrated with PV Rail system. Wire management attachment shall be constructed to be integrated/inserted to PV Rail system through pre-slotted channel. Wire Ties (or similar) will not be acceptable.

2.6 LABELING

A. General: The entire PV system shall be labeled in accordance with requirements Current Edition of the California Electrical Code Article 690.

B. Equipment Labels: Hellerman Tyton, or approved equal

1. Combiner Boxes
2. Enclosures
3. DC Disconnect
4. DC Breaker
5. Inverter
6. AC Disconnect
7. Main Service Disconnect
8. Building / Structure – Rapid Shutdown

C. Raceway Labels: Hellerman Tyton, or approved equal.

D. All handwritten data on labels shall be performed with permanent black ink.

2.7 RAPID SHUTDOWN

A. Rapid Shutdown Pushbutton: EATON M22-PVT-K01 in NEMA 4x enclosure. Location to be coordinated with local Authority having jurisdiction. Button shall interconnect with Microgrid controller to trip AC breakers for PV Inverters.

2.8 PV WIRE

A. General: For use with all direct current circuits.

B. Type: Single conductor copper, Type RHW/RHW-2 PV.

C. Insulation: 2000 Volt, XLPE. Heat, Moisture, Sunlight Resistant, 90°C.

D. Standards: UL 44, UL 4703. VW-1 Vertical Wire Flame Test.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Do not begin installation until mounting surfaces have been properly prepared.

1. Install additional structural steel supports in existing canopy as required to support PV mounting hardware.

2. Examine modules, module connectors and array frame before

installation. Reject modules and arrays that are wet, moisture damaged, or mold damaged. Modules shall not be stored in locations exposed to an exterior environment or open to elements of weather.

3. Examine roofs, supports, and supporting structures for suitable conditions where PV system will be installed.

4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with Current Edition of California Electrical Code.

B. Coordinate layout and installation of PV panels with roof assembly and other construction.

C. Install PV inverters, PV modules, Optimizers, PV Rails, PV Wire Management, supporting structures and electrical raceways in locations indicated on Drawings. Notify Engineer of any conflicts.

D. Wiring Method:

1. PV module to DC Optimizer: Install cables utilizing cable management system. Module to DC Optimizer connections are to be made utilizing factory-made genuine Staubli MC4 connectors. No field wiring, or jumpers, are permitted. Notify Engineer if modules or optimizers do not contain these connectors. Nylon cable ties, or similar supporting methods, will not be acceptable.

2. DC Optimizer to DC Optimizer: All connections between optimizers shall be made utilizing factory wiring. No field wiring or jumpers are permitted. Notify Engineer if a conflict exists. Nylon cable ties, or similar supporting methods, will not be acceptable.

3. Optimizer to inverter: Field-made genuine Staubli MC4 connectors shall be installed on all wiring that will mate with optimizer cables. Crimp shall only be made by Staubli PV-CZM-22100 MC4 crimp tool. No substitutions.

4. All wiring methods outside the PV arrays shall be installed in rigid galvanized steel raceway or neatly laced in cable tray.

5. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

E. CONNECTIONS

1. Coordinate PV array cabling to equipment enclosures to ensure proper connections.

2. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B. Provide evidence of proper torque in field data sheets.

END OF SECTION

SECTION 26 31 01

BATTERY ELECTRICAL SUPPLY SYSTEM

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions under Notice to Bidders and Special Provisions, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Battery Inverter
2. Battery Storage
3. Battery Modules

1.3 STANDARDS AND CODES

A. Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

B. Institute of Electrical and Electronics Engineers (IEEE):

1. 100 CD-13..... The Authoritative Dictionary of IEEE Standards Terms
2. 519-14 ..... Recommended Practices and Requirements for Harmonic Control in Electric Power Systems
3. 937-07 ..... Recommended Practice for Installation and Maintenance of Lead-Acid Batteries for Photovoltaic (PV) Systems
4. 1013-07 ..... Recommended Practice for Sizing Lead-Acid Batteries for Stand-Alone Photovoltaic (PV) Systems
5. 1361-14 ..... Guide for Selection, Charging, Test and Evaluation of Lead-Acid Batteries Used in Stand-Alone Photovoltaic (PV) Systems
6. 1547-03 ..... Standard for Interconnecting Distributed Resources with

Electric Power Systems

7. 1561-07 ..... Guide for Optimizing the Performance and Life of Lead-Acid Batteries in Remote Hybrid Systems
8. 1661-07 ..... Guide for Test and Evaluation of Lead-Acid Batteries Used in Photovoltaic (PV) Hybrid Power Systems

C. International Code Council (ICC):

1. IBC-15 International Building Code
2. IFC-15 ..... International Fire Code

D. National Electrical Manufacturer's Association (NEMA)

1. 250-14 ..... Enclosures for Electrical Equipment (1,000 Volts Maximum)

E. National Fire Protection Association (NFPA)

1. 70-17 National Electrical Code (NEC(:

F. Underwriters Laboratories (UL):

1. 6-07 ..... Electrical Rigid Metal Conduit – Steel
2. 969-17 ..... Standard for Marking and Labeling Systems
3. 1741-10 ..... Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources

1.4 SUBMITTALS

A. Submittals shall comply with paragraph, SUBMITTALS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, and the following requirements:

B. Shop Drawings:

1. Submit sufficient information to demonstrate compliance with drawings and specifications.
2. Include electrical ratings, dimensions, mounting details, materials, required clearances, terminations, weight distribution, wiring and connection diagrams, accessories, and nameplate data.
   a. Include shop drawings for foundations and other support structures.

C. Product Data:

1. Manufacturer's cut sheets for each product.

D. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.

E. Warranty:

1. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of PV system components (modules, inverters, DC optimizers and other appurtenances) that fail in materials or workmanship within specified warranty period.

a. Manufacturer's materials and workmanship warranties include, but are not limited to, the following:

1) PV modules

2) Inverter

3) DC Optimizers

b. Warranty Period: Twelve (12) years from date of Substantial Completion.

2. Manufacturer's Special Minimum Power Output Warranty: Manufacturer agrees to repair or replace components of PV modules that fail to exhibit the minimum power output within specified warranty period. Special warranty, applying to modules only, applies to materials only, on a prorated basis, for period specified.

a. Manufacturer's minimum power output warranties include, but are not limited to, the following warranty periods, from date of Substantial Completion:

1) Specified minimum power output to 80 percent or more, for a period of 25 years.

1.5 COMMISSIONING

A. Third-Party commissioning agent shall be contracted to provide independent commissioning of the PV system. Commissioning agent shall be NABCEP (or equivalent) accreditation for commissioning of PV systems.

1.6 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of Battery Electric Storage System components (batteries, inverters, and other appurtenances) that fail in materials or workmanship within specified

warranty period.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. The system shall confirm to the following specification.

B. BESS shall consist of:

1. A power conversion system (PCS) suitable for outdoor installation on a user-furnished concrete pad or the user-furnished box pad;

2. An energy storage unit of at least 0.5MW/ at least 1.0 MWh at 20%-95% SOC.

3. Lithium-ion battery with life expectancy rating of 10 years under normal operating conditions, suitable for outdoor installation, and a battery management system (BMS).

C. Seismic Qualification Certificates: For battery enclosure and system.

1. Certification of Seismic for planned installation

2.2 POWER CONVERSION SYSTEM (PCS)

A. General: Grid-tied energy storage units are predominately DC in nature. To utilize the energy storage capability on the AC electric grid, the energy from batteries must be converted to a standard AC level and regulated through a converter, generally known as the Power Conversion System (PCS). The PCS serves as the interface between the DC battery system and the AC system, providing bi- directional conversion from DC to AC (for discharging batteries) and AC to DC (for charging batteries). The PCS may consist of one or more parallel units. The PCS shall be bi-directional converter that can be operated in inverting mode for battery discharging and rectifying mode for battery charging.

1. Converter area: The converter area shall contain an AC circuit breaker, converter and DC circuit breaker.

2. AC Termination Area: The user-accessible AC termination area shall include bus terminal pads for connection of utility source and the customer load cables

3. DC Termination Area: The user-accessible DC termination area shall include terminations for cables from the battery pack.

4. Controls Area: The user-accessible controls area shall contain the master controls and associated circuitry to support operation. Within the control area shall be the following:

a. Control panel – The control panel shall include a three-position rotary switch for selecting the control mode of the power unit (MGC- enabled, MGC- disabled, and Remove From Service).

b. Master control board – The master control board shall provide the main processing and control functions of the converter.

c. Power supply – The power supply shall provide the necessary DC control power for the system controls.

B. System Operation

1. Start/stop characteristics: The PCS starts or stops by pushing buttons “RUN” or “STOP”, respectively, or receiving control commands from a local HMI or MGC.

2. Operation during normal condition: The following functions shall be required with the PCS for the grid-connected and islanded (off grid) operation.

a. The AC power transformed efficiently from the DC power of the battery arrays shall be bi- directionally transferred to or from the distribution line without causing harmonics higher than the PEA regulation.

b. The following operation modes shall be provided:

1) Virtual synchronous generator

2) Active and reactive power control

3) Voltage and frequency control

4) Voltage and frequency droop for parallel operation (BESS may be paralleled with PV)

c. Black start capability

d. The PCS shall contain a remote synchronization feature, as well as the standard synchronization used when starting the PCS online. The remote synchronization feature allows the PCS to synchronize its voltage and frequency to any other remote AC bus or generator.

e. PCS shall be stable against the usual change in voltage and frequency of the grid.

3. Operation during abnormal condition: The PCS shall operate as follows during abnormal operation:

a. The PCS stops automatically when serious abnormal conditions

are detected.

b. When not-serious errors are detected, the PCS continues operation with error signals which shall be reported to MGC.

C. Detailed Technical Specifications: Table 1 Summarize PCS Technical Specifications:

TABLE 1 – PCS TECHNICAL SPECIFICATIONS

Details	Technical requirement
AC ratings	
Total rated output power to load @ nominal voltage	0.5 (charge) to 0.5 MW (discharge)
Rate output power of each unit	0.5MW
Real and reactive power control accuracy	±1%
Voltage range	480VAC
Type of output	AC three-phase system
Frequency	60 Hz ±1%
VAR production	Full VAR production at rated voltage
Harmonics	according to PEA standards
DC input ratings	
Voltage range	as defined by bidder
Ripple voltage	Less than 4V RMS
Ripple current	Less than 10% of full current peak to peak
Environmental ratings	
Operating temperature	0ºC - 45ºC without derating
Humidity	0 – 95% non-condensing
Maximum altitude	1,000* m without derating
Seismic Rating	Zone 4
Functions/Features	
Power flow operation	Yes, support four-quadrant control
Real power control	Yes, positive and negative
Reactive power control	Yes, capacitive and inductive
Combination of real and reactive power control	Yes, with real power taking priority
Load following (renewable smoothing)	Yes, allowing renewable smoothing
Low-voltage ride through	Yes, supporting transition from grid connected to islanded operation
Synchro-check function	Yes, supporting parallel operation with the grid, PV and diesel generator
Operation modes	
Black start	Yes, external command
Commanded power	Yes, external command
Commanded VAR	Yes, external command
Frequency regulation	Yes, external command
Frequency response	Yes, automatic

Islanding	Yes, automatic (when utility source is lost) or external command (from MGC or ADDC)
Renewable smoothing	Yes, automatic
Scheduled power	Yes, preconfigured time/date of work power profiles
Voltage regulation	Yes, external command
Response time of PCS to the command received	< 100 ms
Communications	
Communications with MGC	Yes, via DNP 3.0 over IP or IEC61850
Communications with ADDC	Yes, via DNP 3.0 over IP
Battery technologies	
Battery technologies supported	Li-ion
Physical systems	
Protection class	Containerized solution for indoor installation or IP54 for outdoor installation
Cooling system	Yes
Time source	
Time source	CSCS via MGC
Monitoring and control	
Interface, status and control panel	Yes
Battery voltage (AC/DC)	Yes
Battery current (AC/DC)	Yes
Active power (AC/DC)	Yes
Reactive power	Yes
Energy (AC/DC)	Yes
Capacity (Ah)	Yes
Power factor	Yes
Fault	Yes
Battery information	Yes
Audible alarm	Yes
Battery temperature (average/extreme)	Yes
State of Charge (SOC)	Yes
Warning messages	Yes
Efficiency	
Efficiency of power conversion	≥ 95%
Protection system	
Under/over voltage (DC and AC)	Yes
Under/over frequency	Yes
Over current protection	Yes
Ground fault protection	Yes
Over heat protection	Yes
Smoke detection (Trip/Alarm)	Yes
Surge protection (DC and AC)	Yes
Automatic AC & DC open circuit when fault detection	Yes
Insulating monitoring	Yes

Function Features	
Overload capability of 3 MW Switching frequency	120% 30 seconds >= 1 kHz
Insulation resistance	Over 3 M-Ohm at DC 1000 V (exclude the circuit less than DC 60V)
Withstand voltage	AC 2000V 1 minute (exclude the circuit less than DC 60V)
Withstand impulse voltage	± 5000V 1.2 x 50μS each 3 times
Noise level	
Noise level	Less than 50 dBA at 10 meters from the BESS

2.3 ENERGY STORAGE

A. Battery Type: Battery shall be off Lithium-Ion type suitable for utility scale BESS. Different chemistry of Lithium-Ion batteries, such as Lithium Manganese (LMO), Lithium Phosphate (LFP), Lithium Nickel Manganese Cobalt Oxide (NMC), Lithium Nickel Cobalt Aluminum Oxide (NCA), can be proposed.

B. Detailed Technical Specifications: Table 2 Summarizes technical specifications of the battery energy storage system (BESS).

TABLE 2 – ENERGY STORAGE UNIT TECHNICAL SPECIFICATIONS

Details	Technical requirement
Rated output power @ nominal voltage	0.5MW (charge) to 0.5MW (discharge) (Continuous discharge measured at PCS output)
Energy	At least 1 MWh at 20%-95% SOC, at least 4 hours at 0.25MW to load
Type	Li-ion
Allowable charging capacity	See Note #1 below table
Discharging capacity	See Note #1 below table
Round-trip AC energy efficiency (including auxiliaries) at 22 kV system	> 80%
Cycle life	> 4,000 at 20-80% SOC

<u>Note #1</u> – Charging and discharging requirements shall meet the requirements of the worst case solar smoothing requirements, full charge and full discharge

C. Standard: Battery preferable produced by a manufacturer certified with ISO 9001 or equivalent

D. Battery Module/Tray

1. Battery module shall consist of many battery cells connected in series/parallel.

2. Module/tray battery management system (BMS) shall be provided.

3. Automatic module balancing shall be provided.

4. Module/tray cooling system shall be provided

E. Battery Rack

1. Battery modules shall be connected in series/parallel in the battery rack so that the nominal voltage of the DC is more than 480V, suitable for PCS DC voltage.

2. Rack BMS with battery fuse, DC current measurement devices and contractors shall be provided.

3. Electrical connection shall be at rack front side.

4. Many racks shall be connected in parallel to total capacity required for this project.

5. All racks shall seismic rated for the location.

F. Battery Protection: The following protections shall be provided:

1. Over-charge protection

2. Over-discharge protection

3. Over-temperature protection

4. Over-current protection

5. Ground-fault detection

6. Internal battery fault detection

7. Cell balancing

8. Protective devices should include for DC-side protection:

a. Battery fuse for each battery cell and module (preferred)

b. DC contactor for each battery rack

9. Grounding over current (76G)

G. Cycle Life

1. If the product is sensitive to depth of discharge, the manufacturer must state the limitations and the product should be sized such that the depth of discharge corresponds to the required cycle life.

2. For purposes of estimating and demonstrating cycle life, cycles are defined in the same manner as system efficiency.

3. For lifetime assessment the supplier should provide a graph that displays the relationship between depth of discharge and the corresponding number of cycles available within the system's life.

4. Results of charging and discharging are tested at 1C.

2.4 BATTERY MAINTENANCE SYSTEM (BMS)

A. General: BMS is used to monitor, protect, maintain safety and optimal operation of each battery cell, module and rack. BMS consist of: Module/tray BEMS, rack BMS and system BMS.

B. Minimum Functions of Module/Tray BMS:

1. Metering and monitoring

2. Battery cell voltage (all cells)

3. Battery module voltage

4. Battery cell temperature (at least one or several measured locations in battery module/tray)

5. Battery module current

6. Cell balancing

7. Module/tray BMS should balance voltage of cells

8. Safety protection

9. Module/tray BMS should protect the battery cells and module/tray from:

10. Over and under voltage

11. Over current

12. Short circuit current

13. Over and under temperature

14. Data communication: all metering items and contactor status shall be provided for rack BMS control and monitoring system.

C. Minimum Functions of Rack BMS

1. Metering and monitoring

2. Battery rack voltage

3. Battery rack current

4. Battery rack temperature (one or several locations in battery rack)
5. Battery SOC of battery modules
6. Module/tray balancing
7. Balancing battery modules/trays scheme
8. Safety protection
9. Rack BMS should protect the battery rack from:
10. Over and under voltage
11. Over current
12. Short circuit current
13. Over and under temperature

2.5 ALARMS AND RESETS

A. Alarms:

1. Informational Notification—indicates the status of the unit.
2. Warning Alarm—indicates a problem with the converter requiring attention (not affecting proper operation).
3. Converter Inhibit—indicates a problem with the converter affecting proper operation. The converter will stop operation.
4. Trip Offline Alarm—indicates a severe problem with the converter. The system will not operate.
5. Isolate Alarm—indicates a problem affecting proper operation of the system. The system will operate with limited functionality.
6. Fire detection remote alarm status for main fire alarm control panel, and control and monitoring system.
7. These alarms shall be reported to MGC and HMI of BESS system.

B. Resets: Energy storage unit alarms shall be reset by any of the following means.

1. Manual Reset—via the reset button located on the control panel, or via a personal computer connected to the control panel Ethernet port.
2. Auto Reset—automatically performed until reaching a predetermined reset count.

3. Self Reset—automatically performed whenever required.

2.6 ENCLOSURE CONSTRUCTION

A. The PCS shall be contained within a weatherproof, moisture-sealed, tamper-resistant, metal enclosure with a minimum IP54 or equivalent rating suitable for outdoor installation on a concrete pad or cover of a fiberglass box pad, in accordance with the following requirements.

1. The enclosure shall not utilize replaceable filters, dehumidifiers, or similar features requiring periodic maintenance. Air intakes are designed so that any entrance of water or dust is directed away from internal components and does not affect operation of the unit.

2. The enclosures shall be equipped with complete and failsafe fire detection/extinguishing system.

3. The overall enclosure footprint shall not exceed 20'-0” x 8'-0”.

4. The enclosure shall comply with security requirements of IEEE C57.12.28 Section 4. The enclosure shall limit access to the controls and physical network connections.

5. The enclosure shall comply with coating system requirements of IEEE C57.12.28 Section 5.

6. Enclosure grounding shall be provided.

7. The enclosure shall have access control.

8. If applicable, wiring and weather-tight enclosure egress to an external antenna shall be provided.

9. A nameplate shall be provided specifying the following:

   a. Manufacturer name

   b. Connection diagram

   c. Unit ratings: Power, energy, voltage, BIL

   d. Specimen data: serial number, date of manufacture

10. Signage shall indicate Source and Load-Side AC Buses, Neutral Bus, DC Bus, Isolation Contactor, and Module names. Custom signage will be in accordance with specific utility requirements.

11. All necessary safety signs and warnings as described in ANSI Z535-2002 shall be included on the unit.

12. All necessary signs and warnings for identification of hazardous materials as described in NFPA 704 shall be included on the unit.

2.7 SAFETY

A. General:

1. The BESS must be compliant with IEEE 1547, IEC 62619, and UL 1973 as appropriate. Systems must be able to protect themselves from internal failures and utility grid disturbances.

2. For all BESS equipment, the Supplier shall provide information on specific safety issues related to the equipment, including appropriate responses on how to handle the energy storage system in case of an emergency, such as fires or module ruptures.

B. Fire Mitigation

1. Provisions shall be included to extinguish internal container fires without the need to open container doors.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrate areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Do not begin installation until mounting surfaces have been properly prepared.

C. If preparation of mounting surfaces is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Examine modules, module connectors and array frame before installation. Reject modules and arrays that are wet, moisture damaged, or mold damaged. Modules shall not be stored in locations exposed to an exterior environment or open to elements of weather.

E. Examine roofs, supports, and supporting structures for suitable conditions where container battery system will be installed.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with Current Edition of California Electrical Code.

END OF SECTION

SECTION 26 32 13

GAS ENGINE DRIVEN GENERATOR SETS

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 WORK INCLUDED

A. The installation of the power generation system shall include the following:

1. Engine-driven generator set
2. Control system
3. Cooling system
4. Fuel supply system
5. Generator set accessories
6. Mounting system
7. System control
8. Outdoor Enclosure

B. Roughing-in, installation of equipment, and final connection of utilities, with labor, services, and incidentals necessary for complete and operational equipment installation.

C. Piping, wiring, and switching between equipment and utilities.

1.2 CODES, STANDARDS AND REGULATORY REQUIREMENTS

A. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. The organizations having jurisdiction include, but are not limited to, the following:

1. ANSI/IEEE 112 Test Procedures for Polyphase Induction Motors and Generators.

2.	ANSI/IEEE 115	Test Procedures for Synchronous Machines.
3.	ANSI/IEEE C.2	National Electric Safety Code.
4.	ANSI/ISA S18.1	Annunciator Sequence and Specification.
5.	ASCE/SEI 7	American Society of Civil Engineers/Structural Engineering Institute
6.	ASME	American Society of Mechanical Engineers
7.	EEC 89/392	Safety and Health
8.	EGSA	Electrical Generating Systems Association
9.	EPA	Federal, State and Local Environmental Protection Agencies
10.	IBC	International Building Code, California Edition
11.	IEEE	Institute of Electrical and Electronics Engineers
12.	IEC	International Electrotechnical Commission
13.	ISO	International Standards Organization 9000
14.	NEC	National Electrical Code.
15.	NEMA ICS-2	Enclosures for Industrial Control and Systems.
16.	NEMA MGI	Motors and Generators.
17.	NEMA MG2	Safety Standard for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators.
18.	NESC	National Electrical Safety Code.
19.	NFAC	National Fire Alarm Code.
20.	NFPA 37	Installation and Use of Stationary Combustion Engines and Gas Turbines.
21.	OSHA	Regulations of the Occupations Safety and Health Administration.
22.	SAE	Society of Automotive Engineers
23.	UL	Underwriter's Laboratories Inc.

24. The state, county or municipal laws and regulations governing the location where the equipment is to be installed

C. Reference to any code, standard or regulation shall mean the latest published edition, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

D. In the event of conflict between codes, standards or regulations, the conflict shall be referred to the Engineer for resolution.

1.3 SUBMITTALS

A. Shop Drawings: Submit in accordance with Division 1 -General Requirements of these specifications.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.

B. Submittals shall include but not be limited to:

1. Component List - A breakdown of all components and options including switchgear.

2. Technical Data - Manufacturer produced generator set specification or data sheet identifying make and model of engine and generator and including relevant component design and performance data.

a. Engine:

1) Type, aspiration, compression ratio, and combustion cycle

2) Bore, stroke, displacement, and number of cylinders

3) Engine lubricating oil capacity

4) Engine coolant capacity without radiator

5) Engine coolant capacity with radiator

6) Coolant pump external resistance (maximum)

7) Coolant pump flow at maximum resistance

b. Alternator:

1) Model

2) Frame

3) Insulation class

4) Number of leads

5) Weight, total

6) Weight, rotor

7) Air flow

c. At rated voltage:

1) Efficiency at 0.8 power factor for: 50% load

2) 75% load

3) 100% load

4) Time constants; short circuit transient (T'D)

5) Time constants, armature short circuit (TA)

6) Reactance, subtransient - direct axis (X"D),

7) Reactance, transient - saturated (X'D)

8) Reactance, synchronous - direct axis (XD)

9) Reactance, negative sequence (X2)

10) Reactance, zero sequence (X0)

11) Fault current, 3 phase symmetrical

12) Decrement curve

d. Radiator:

1) Model

2) Type

3) Fan drive ratio

4) Coolant capacity, radiator

5) Coolant capacity, radiator and engine

6) Weight, dry

7) Weight, wet

e. System:

1) Dimensions:

a) length

b) width

c) height

d) Weight, dry

e) Weight, wet

2) Power rating at 0.8 power factor

3) kVA rating

4) Fuel consumption at standard conditions for:

a) 50 % load

b) 75 % load

c) 100% load

5) Combustion air inlet flow rate

6) Exhaust gas, flow rate

7) stack temperature

8) Exhaust system backpressure (maximum)

9) Heat rejection to:

a) coolant

b) aftercooler

c) exhaust

d) atmosphere from engine

e) atmosphere from generator

C. Auxiliary Equipment - Specification or data sheets, including switchgear, load bank, vibration isolators, and day tank.

D. Drawings - General dimensions drawings showing overall generator set measurements, mounting location, and interconnect points for load leads, fuel, exhaust, cooling and drain lines.

E. Wiring Diagrams - Wiring diagrams, schematics and control panel outline drawings published by the manufacturer in Joint Industrial Council (JIC) format for controls and switchgear showing interconnected points and logic diagrams for use by contractor and owner.

F. Warranty Statements - Warranty verification published by the manufacturer.

G. Service - Location and description of supplier's parts and service facility including parts inventory and number of qualified generator set service personnel.

H. Product Data:

1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.

2. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

3. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

B. Load Bank

1. The manufacturer shall submit for review technical data including features, performance, electrical characteristics, physical characteristics, ratings, accessories, and finishes.

2. Shop drawings shall include dimensional plans and mounting details sufficient to properly install the load bank. Load bus configuration and load connections termination area shall be clearly identified.

3. Electrical schematic drawings shall be provided to detail the operation of the load bank and the provided safety circuits. Over-current protection and control devices shall be identified and their ratings marked. An interconnection drawing shall be included for control wiring related to the load bank.

4. A complete parts list with part numbers, device identification, rating shall be included in the manuals. The original manufacturers name and part number shall be included in the parts listing.

5. Installation and operation manuals shall be provided with the equipment and shall include complete details for the installation, commissioning, operation, and maintenance of the load bank.

6. The manuals shall include the electrical schematic and interconnect drawings for the power and control wiring for the load bank and all control devices.

I. Operation and Maintenance Manual:

1. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

   a. Description of system and components.

   b. Schematic diagrams of electrical, plumbing and compressed air systems.

   c. Manufacturer's printed operating instructions.

   d. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

   e. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

1.4 PRODUCT SUBSTITUTIONS

A. Follow requirements specified in Division 1 - General Requirements.

B. Additional costs resulting from substitution of products other than those specified, including drawing changes and construction, will be at the expense of the Contractor.

C. Substitution Approval: Manufacturers listed for each equipment item may bid without submittal for that item. Manufacturers not listed shall submit for approval in accordance with "Instructions to Bidders". Prior to installation, submittals for each equipment item by Mark Number shall be provided in accordance with Division 1 - General Requirements.

1.5 QUALITY ASSURANCE

A. The complete power generation system, including engine, generator, shall be the product of one manufacturer who has been regularly engaged in the production of complete generating systems for at least fifteen (15) years. All components shall have been designed to achieve optimum physical and performance compatibility
and prototype tested to prove integrated design capability. The complete system shall have been factory fabricated, assembled, and production tested (transfer switches not included in the factory system test) as performed by the manufacturer. The engine must be designed and manufactured by the generator set manufacturer. Suppliers/Manufacturers using engines other than their own product and assembling it into a generator set will not be considered. The local

supplying dealer must be a factory authorized facility allowing for troubleshooting access to all generator components and ECM's. Suppliers that cannot troubleshoot and repair every component on the generator set will not be considered. The naming of a specific manufacture does not waive any requirements of this specification. Any exceptions or variations must be noted as described in paragraph 1.10, Equipment Alternatives

B. The Supplier of the Engine/Generator set shall be responsible for satisfactory total operation of the system and its certification. This Supplier shall have had experience with three or more installations of systems of comparable size and complexity in regards to coordinating, engineering, testing and supervising. Each of these installations shall have been in successful operation for three or more years. Prior to review of submittals, the Engineer reserves the right to:

1. Have the Supplier submit a list of locations of similar installations.

2. Inspect any of these installations and operations of Engine/Generator package and question the user concerning the installations without the presence of the Supplier.

C. Factory authorized representative shall be capable of providing emergency maintenance and repairs at the project site within four (4) hours maximum of notification.

D. A single Supplier shall be responsible for the furnishing of the Engine/Generator, Load Bank, Switchgear and SCR with auxiliary components as specified and as required. Supplier shall design Generator enclosure with capability to support the SCR reactor housing and all associated piping/accessories.

E. Noise level developed by the generator set shall be as herein specified.

F. Load Bank

1. The load bank shall be fully tested using a test specification written by the supplier. Tests shall include electrical functional testing, verifying conformance to assembly drawings and specifications. Each load step shall be cold resistance checked to verify proper calibration of resistive load steps and proper ohmic value.

2. The manufacturer shall maintain this data on file for inspection purposes by the purchaser. Tests using high potential equipment shall be performed to ensure isolation of the load circuits from the control circuits and to determine isolation of the load circuits from the load bank frame. Tests of all safety circuits shall be performed to verify conformance to the specification

3. All electrical circuits shall have a high potential insulation resistance test performed at twice rated voltage plus 1000 VAC to assure insulation integrity.

4. All quality control test equipment shall be regularly maintained

and calibrated to traceable national standards.

5. The Company's Quality System shall be ISO9001 Certified.

6. The load bank shall be manufactured by a firm regularly engaged in the manufacture of load banks and who can demonstrate at least five (5) years experience with at least twenty five (5) installations of load banks similar or equal to the ones specified herein.

7. The manufacturer shall have a written Quality Control procedure available for review by the purchaser, which will document all phases of operations, engineering, and manufacturing.

G. Supplier shall submit certification that Engine/Generator, accessories, and components will withstand seismic forces defined in the IBC "International Building Code" CA Edition.

H. Manufacturer's Representative:

1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out and start up.

2. Training: Provide technical representative to train Owner's maintenance personnel in operation and maintenance of specified equipment.

1.6 FIELD CONDITIONS

A. The operating environment of the power generating system shall be:

1. Altitude: 66 ft

2. Max Ambient Temperature: 105 F

3. Minimum Ambient Temperature: 25 F

4. Fuel Type: Pipeline Natural Gas

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery shall be FOB to the jobsite by the system manufacturer's authorized dealer. The genset, enclosure, genset and any components shall be shipped in pieces measuring no more than 12' W x 40' L and have a weight of no more than 40 tons.

B. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid, dusty conditions.

C. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Mark Number of this specification.

D. The Engine/Generator Supplier shall be responsible for the shipment of the unit to the job site. Supplier shall be responsible for packaging and all precautions necessary for shipments to arrive at destinations in the condition shipped when handled by commercial carriers.

E. Installing Contractor shall be responsible for the receiving and unloading of the equipment at the job site. This responsibility includes proper protection for storage at the job site.

F. Supplier shall confirm shipping clearances and shall provide the status of shipments in transit upon request.

G. Supplier shall, 4 weeks prior to shipping, provide a complete list of material to be shipped. Included in this submittal shall be a list of loose ship material including the weight and sizing of such packages

1.8 LABELING

A. Manufacturer shall securely attach in a prominent location on each major item of equipment a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (U.L.), or other National Recognized Testing Laboratory (NRTL), in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

1.9 WARRANTY

A. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

B. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

C. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to the Owner. Warranty shall include materials and labor necessary to correct defects.

D. The manufacturer's authorized dealer shall be capable of administering the manufacturer and dealer's warranty for all components supplied by the selling dealer (who may or may not be the same as the servicing dealer).

1. The manufacturer's and dealer's extended warranty shall in no event be for a period of less than five (5) years from date of initial start-up of the system
and shall include repair parts, labor, reasonable travel expense necessary for repairs at the jobsite, and expendables (lubricating oil,

filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Applicable deductible costs shall be specified in the manufacturer's warranty. Provide a temporary generator set in the event a covered repair exceeds 96 hours. Submittals received without written warranties as specified will be rejected in their entirety.

2. The enclosure and all ancillary options shall have a two-year parts and labor warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. Engine

a. Caterpillar

b. Cummins

c. MTU

d. Jenbacher

e. Approved Equal

2. Governor:

a. Caterpillar

b. Woodward

3. Alternator:

a. Caterpillar

b. Kato

c. Leroy Somers

d. Marathon

4. Voltage regulator:

a. Caterpillar

b. Basler

c. Marathon

5. Radiator:
    a. Caterpillar
    b. Cummins
    c. MTU
6. Silencer:
    a. Caterpillar
    b. Harco
    c. GT Exhaust
7. Battery charger:
    a. Caterpillar
    b. Sens
    c. Lamarche
8. Circuit breakers:
    a. Merlin Gerin
    b. Square D
    c. Siemens
    d. ABB
9. Vibration Isolators:
    a. Caterpillar Ace
    b. Korfund
    c. Mason
10. Enclosures:
    a. Precision Power Source
    b. Fiberbond
    c. Robinson
    d. Modutek
11. SCR

a. Safety Power

b. Miratech

2.2 PERFORMANCE

A. Engine exhaust emissions at full load shall meet the criteria listed in Part IV - Attachments prior to any emission control device.

B. The Engine/Generator set shall conform to the technical criteria listed in Part IV – Attachments.

C. Rating - Engine brake horsepower shall be sufficient to deliver full rated generator set kW/kVA when operated at rated rpm and equipped with all engine-mounted parasitic and external loads such as radiator fans and power generators.

D. Conditions - The rating shall be based on ISO 3046/1 standard conditions of 100 kPa and 27C (29.53 in Hg, 81F

E. Fuel – Natural Gas engines shall be able to deliver rated power when operating on pipeline natural gas having an LHV of 920 BTU/cu ft

F. Block Load Acceptance - Transient response shall conform to ISO 8528 requirements.

G. Exhaust Emissions - The proposed generator set shall be in compliance with San Diego County Air Pollution Control District (APCD) emission regulations for a spark ignited engine in a peak shaving/continuous application.

2.3 GAS ENGINE DRIVEN GENERATOR

A. The engine shall be equipped with air filters, restriction gauge, lubricating oil cooler, filters, and pressure gauge, water pump and temperature gauge, service hour meter, flywheel, and flywheel housing when applicable.

B. Structure/Metallurgy

1. The design of the basic engine shall provide for maximum structural integrity to extend service life. Materials used in the engine shall incorporate the highest level of proven metallurgical and manufacturing technology. Block shall be of one-piece design and cast of high tensile strength iron.

C. Lubrication System

1. The lubrication oil pump shall be a positive displacement type that is integral with the engine and gear driven from the engine gear train. The system shall incorporate full flow filtration with bypass valve to continue lubrication in the event of filter clogging.

2. The bypass valve must be integral with the engine filter base or

receptacle. The filter shall incorporate a self-lubricating, free rotating seal and have a nonmetallic core sufficiently rigid to minimize movement or shifting of the filtration media.

D. Electronic Fuel Control Valve

1. The engine shall be equipped with an electronic engine fuel control valve. Fuel control valve shall mix the fuel with the intake combustion air. It shall meter incoming fuel and provide throttle control for engine operation. It shall require no more the .5 PSI at the inlet to the throttle control unit.

E. Fuel Strainer

1. A fuel strainer shall be provided as per the generator set MFG requirements to remove particles and debris from the incoming fuel supply line

F. Fuel Train

1. Provide the incoming fuel train as required per the MFG requirements for a natural gas fired engine generator set. Pressure losses through the fuel train shall be kept to a minimum. Provide fuel train per NFPA 37. Maximum pressure loss through the fuel train shall be 0.15 PSi

G. Fuel Lines

1. Flexible fuel lines between engine and fuel supply shall be installed to isolate vibration.

H. Engine Control

1. The engine control shall be an electronic type and shall control engine speed while optimizing both steady state and transient engine performance. The control will monitor all significant engine parameters, and adjust engine performance according to speed, altitude, temperature, aftercooler temperature, and engine condition. It shall incorporate revisable control software capable of reconfiguring engine operation to desired performance levels.

2. The engine control shall be configured to avoid interruption of power whenever possible. In the event of system faults, which do not require immediate shutdown, the engine shall be programmed to continue operation at power levels sufficient to remain within performance limits. Engine governing shall maintain steady state speed regulation of +/- 1% and be adjustable. In the event of a DC power loss, the fuel system will remain closed.

I. Cooling System

1. The engine jacket water cooling system shall be a closed circuit design with provision for filling, expansion, and deaeration. The cooling pump shall be gear driven by the engine. Auxiliary coolant pumps required for

heat exchangers or separate circuit aftercooling shall also be gear driven by the engine. The cooling system shall tolerate at least 172-kPa (25-PSI) static head. Coolant temperature shall be internally regulated to disconnect external cooling systems until operating temperature is achieved. Radiator shall be rated at 105 degrees F.

J. Radiator

1. Heat rejected to the engine jacket water shall be discharged to the atmosphere through a close-coupled radiator. The radiator shall be sized to cool the engine continuously while operating at full rated load and at specified site conditions.

K. Fan and Belt Guarding

1. The fan, fan drive, and fan belts shall be covered with 14 gauge punched steel mesh guarding for personnel protection. The guarding shall conform to IEC 34-5, ISO and OSHA standards.

L. Blower Fan

1. The radiator-cooling fan shall be a blower type driven from the engine. Air shall be drawn from the engine side and exhausted through the radiator core. It shall have an external static pressure capability of 0.75" H_20, not including the radiator core.

M. Inlet Air System

1. The engine air cleaner shall be engine mounted with dry element requiring replacement no more frequently than 250 operating hours or once each year.

N. Turbocharging

1. Turbochargers shall be of the radial turbine type driven by engine exhaust gases and direct - connected to a compressor supplying engine combustion air.

O. Crankcase Fumes Reclamation

1. Provide a crankcase fumes reclamation system on the engine. System shall collect crankcase emissions, filter out airborne lube oil, and return the crankcase fumes back to the engine air intake. Crankcase fumes shall not be allowed to vent directly into the atmosphere. Fumes collection system shall be as MFG by Racor or approved equal

P. Wiring and Conduit

1. Engine and generator control wiring shall be multi-strand annealed copper conductors encased by cross-linked polyethylene insulation resistant to heat, abrasion, oil, water, antifreeze, and diesel fuel. Wiring shall be suitable for continuous use at 120C (250F) with insulation not

brittle at -50C (-60F). Each cable will be heat stamped throughout the entire length to identify the cable's origin and termination. Cables shall be enclosed in nylon flexible conduit, which is slotted to allow easy access and moisture to escape. Reusable bulkhead fittings will attach the conduit to generator set mounted junction boxes.

Q. Electrical Starting System

1. The engine starting system shall include 24V dual DC starting motors, starter relay, and automatic reset circuit breaker to protect against butt engagement. Batteries shall be maintenance free, lead acid types mounted near the starting motor. A corrosion resistant or coated steel battery rack shall be located to avoid spillage from servicing of fuel and oil filters. Required cables will be furnished and sized to satisfy circuit requirements. The system shall be capable of starting a properly equipped engine within 60 seconds at ambient temperatures.

R. Jacket Water Heater

1. Jacket water heater shall be provided to maintain coolant temperature of 32C (90F) while the engine is idle. Heaters shall accept 120 or 240 VAC single phase power and include thermostatic controls. Hoses to and from the heater shall be industrial quality, which exhibit long life in operational environments. Manual shutoff valves shall be incorporated to isolate the heaters during servicing.

S. Batteries

1. Batteries for starting and control shall be selected and supplied by the generator set manufacturer. They shall be a heavy duty SLI lead acid type with thru-partition connectors, and housed in a hard rubber or polypropylene case with provision for venting.

2. Starting batteries shall be rated 24V DC Sizing shall consider specific application requirements of engine oil viscosity, ambient starting temperature, control voltage, overcharging and vibration.

3. Batteries shall be located as close to the starting motor as practical, away from spark sources, in a relatively cool ambient, and permit easy inspection and maintenance. Battery warranty shall be the responsibility of the generator set manufacturer.

T. Alternator

1. An engine-mounted belt driven battery-charging alternator shall be installed with an automatic voltage regulator. It shall be suitable for heavy-duty applications with a rating of 24V 35 amperes minimum.

2. The alternator(s) shall be rated for peak shaving/continuous service at 1000 ekW, 1250 kVA, 0.80 PF, 480 VAC, three phase, 3 wire, 60 Hz, 1800 rpm.

3. The alternator(s) shall be capable of withstanding a three-phase load of 300% rated current for 10 seconds, and sustaining 150% of continuous load current for 2 minutes with field set for normal rated load excitation.

4. It shall exhibit less than 5% waveform deviation at no load.

5. Structured – Close Coupled

    a. The alternator shall be close coupled, drip proof and guarded, constructed to NEMA 1 and IP 22 standards, single bearing, salient pole, revolving field, synchronous type with amortisseur windings in the pole faces of the rotating field. The alternator terminal box shall provide generous space for entrance and installation of power cables.

6. Mechanical Design

    a. The alternator housing shall be one piece and mount directly to the engine flywheel housing without bolted adapters. Engine torque shall be transmitted through flexible steel plates to the alternator rotor. The alternator-ventilating fan shall mount to the engine flywheel and act as a pressure plate to secure the flexible plates.

7. Windings

    a. The windings shall consist of copper magnet wire coated with an underlay of polyester (amide)(imide) resins and a superimposed heavy coat of polyamideimide resins. All winding insulation materials shall be Class H in accordance with BS and IEEE standards. No materials shall be used which support fungus growth, and shall be impervious to oil, dirt, and fumes encountered in diesel and natural gas engine operating environments. Temperature rise shall be 80 degree C rise over 40 degree C ambient. Pitch shall be 2/3.

8. Operating Environment

    a. The alternator shall be designed to operate in a sheltered drip-proof environment.

9. Excitation

    a. The alternator exciter shall be brushless with the circuit consisting of a three-phase armature and a three-phase full wave bridge rectifier mounted on the rotor shaft. Surge suppressors shall be included to protect the rotating diodes from voltage spikes.

10. Exciter – PMG Type

    a. The permanent magnet excitation system shall derive excitation current from an external stator shaft mounted exciter. It shall

enable the alternator to sustain 300% of rated current for ten seconds during a fault condition.

11. Voltage Regulator

a. The voltage regulator shall be microprocessor based with adjustable operating and protection characteristics. The regulator shall be capable of sensing true RMS in three phases of alternator output voltage or operating in single phase sensing mode. It shall exhibit the following operational characteristics:

1) Alternator output voltage maintained within +/- 0.5% at steady state conditions.

2) Alternator output voltage maintained within +/- 0.5% of rated value for any load variation between no load and full load.

3) Alternator output voltage drift no more than +/-0.5% of rated value at constant temperature.

4) Alternator output voltage drift no more than +/- 0.5% of rated value within a 40 change over ambient temperature range of -40øC to 70øC.

U. Mounting

1. The engine and generator shall be assembled to a common base by the engine-generator manufacturer. The generator set base shall be designed and built by the engine-generator manufacturer to resist deflection, maintain alignment, and minimize resonant linear vibration.

2. Isolator – Spring Type

a. Provide spring type vibration isolators to be mounted between the generator set base assembly and the site mounting surface. Isolators shall be spring type seismic zone 2 compliant. Isolators shall have a maximum deflection of 1” Isolators shall be Ace Mountings 822 series or approved equal

V. Controls, Protection, and Monitoring

1. The controls, protection, and monitoring systems of the generator set and its operation shall be the responsibility of the generator set manufacturer. All subsystem components, interfaces, and logic shall be compatible with engine mounted devices.

2. Cycle Cranking

a. A cycle crank timer shall provide five 10 second cranking periods separated by 10-second rest periods.

b. Engine Cooldown

1) A cool down timer shall provide an adjustable 0-30 minute engine-running period before shutdown after removal of load.

3. Controls – Generator Set Mounted

a. Provide a fully solid-state, microprocessor based, generator set control. The control panel shall be designed and built by the engine manufacturer. The control shall provide all operating, monitoring, and control functions for the generator set. The control panel shall be Caterpillar EMCP4 or approved equal.

b. Environmental

1) The generator set control shall be tested and certified to the following environmental conditions:\ –40°C to +70ºC Operating Range
100% humidity condensing, 30ºC to 60ºC
IP22 protection

2) 5% salt spray, 48 hours, +38ºC, 36.8V system voltage

3) Sinusoidal vibration 4.3G's RMS, 24-1000Hz

4) Electromagnetic Capability (89/336/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC, BS EN 50081-2, 50082-2)

5) Shock: withstand 15G

c. Functional Requirements

1) The following functionality shall be integral to the control panel.

a) The control shall include a minimum 64 x 240 pixel, 28mm x 100mm, white backlight graphical display with text based alarm/event descriptions

b) The control shall include a minimum of 3-line data display

c) Audible horn for alarm and shutdown with horn silence switch

d) Standard ISO labeling

e) Multiple language capability

f) Remote start/stop control

g) Local run/off/auto control integral to system

microprocessor

h) Cooldown timer

i) Speed adjust

j) Lamp test

k) Push button emergency stop button

l) Password protected system programming

d. Digital Monitoring Capability

1) The controls shall provide the following digital readouts for the engine and generator. All readings shall be indicated in either metric or English units

2) Engine

a) Engine oil pressure

b) Engine oil temperature

c) Engine coolant temperature

d) Engine RPM

e) Battery volts

f) Engine hours

3) Generator

a) Generator AC volts (Line to Line, Line to Neutral and Average)

b) Generator AC current (Avg and Per Phase)

c) Generator AC Frequency

d) Generator kW (Total and Per Phase)

e) Generator kVA (Total and Per Phase)

f) Generator kVAR (Total and Per Phase)

g) Power Factor (Avg and Per Phase)

h) Total kW-hr

i) Total kVAR-hr

j) % kW

k) % kVA

l) % kVAR

e. Alarms and Shutdowns

1) The control shall monitor and provide alarm indication and subsequent shutdown for the following conditions. All alarms and shutdowns are accompanied by a time, date, and engine hour stamp that are stored by the control panel for first and last occurrence:

2) Engine Alarm/Shutdown

a) Low oil pressure alarm/shutdown

b) High coolant temperature alarm/shutdown

c) Loss of coolant shutdown

d) Overspeed shutdown

e) Overcrank shutdown

f) Low coolant level alarm

g) Emergency stop depressed shutdown

h) Low coolant temperature alarm

i) Low battery voltage alarm

j) High battery voltage alarm

k) Control switch not in auto position alarm

l) Battery charger failure alarm

3) Generator Alarm/Shutdown

a) Generator over voltage

b) Generator under voltage

c) Generator over frequency

d) Generator under frequency

f. Maintenance

1) All engine, voltage regulator, control panel and accessory

units shall be accessible through a single electronic service tool. The following maintenance functionality shall be integral to the generator set control

a) Engine running hours display

b) Service maintenance interval (running hours or calendar days)

c) Engine crank attempt counter

d) Engine successful starts counter

e) 20 events are stored in control panel memory

f) Programmable cycle timer that starts and runs the generator for a predetermined time. The timer shall use 14 user-programmable sequences that are repeated in a 7-day cycle. Each sequence shall have the following programmable set points:

(1) Day of week

(2) Time of day to start

(3) Duration of cycle

g. Remote Communications

1) The control shall include Modbus RTU communications as standard via RS-485 half duplex with configurable baud rates from 2.4k to 57.6k.

h. Local and Remote Annunciation

1) Local Annunciator (NFPA 99/110, CSA 282)

2) Provide a local, control panel mounted, annunciator to meet the requirements of NFPA 110, Level 1.

a) Annunciators shall be networked directly to the generator set control

b) Local Annunciator shall include a lamp test pushbutton, alarm horn and alarm acknowledge pushbutton

c) Provide the following individual light indications for protection and diagnostics

(1) Overcrank

(2) Low coolant temperature

(3) High coolant temperature warning

(4) High coolant temperature shutdown

(5) Low oil pressure warning

(6) Low oil pressure shutdown

(7) Overspeed

(8) Low coolant level

(9) EPS supplying load

(10) Control switch not in auto

(11) High battery voltage

(12) Low battery voltage

(13) Battery charger AC failure

(14) Emergency stop

(15) Spare

(16) Spare

d) Provide a remote annunciator that shall provide annunciation of all points stated below and shall incorporate ring-back capability so that after silencing the initial alarm, any subsequent alarms will sound the horn

e) Ability to be located up to 4000 ft from the generator set

f) Provide the following individual light indications for protection and diagnostics

(1) Overcrank

(2) Low coolant temperature

(3) High coolant temperature warning

(4) High coolant temperature shutdown

(5) Low oil pressure warning

(6) Low oil pressure shutdown

(7) Overspeed

(8) Low coolant level

(9) EPS supplying load

(10) Control switch not in auto

(11) High battery voltage

(12) Low battery voltage

(13) Battery charger AC failure

(14) Emergency stop

(15) Spare

(16) Spare

W. Battery Charger

1. A battery charger shall be provided which shall accept 120 VAC single phase input to provide 24 VDC output. It shall be fused on the AC input and DC output; and incorporate current limiting circuitry to avoid the need for a crank disconnect relay. An AC voltage power switch shall be mounted on the face of the charger and shielded from accidental switching. The charger shall include an AC ammeter and voltmeter, a failure malfunction alarm switch, and be housed in a NEMA 1 enclosure suitable for wall mounting. It shall include alarm relays for remote annunciation of battery charger failure, low DC volts, and high DC volts, per NFPA 110

2.4 MAINLINE GENERATOR PROTECTION – OUTDOOR ENCLOSURE

A. Construction: The enclosure shall be vandal-resistant, rust-resistant and weather-protective housing and shall be of a 0.125” thick 3003 Aluminum formed construction. The enclosure is rated to a wind load of 125 MPH and 50lbs./sq ft roof load. Rain test equal to 4 inches/hour. The basic structure meets all seismic requirements of Zone 4 or equivalent. The design and construction shall be modular in that the panels shall not exceed 24” in width. All exterior components of the enclosure shall be assembled utilizing stainless steel bolts, nuts and lock washers. All seams shall be sealed to prevent leaks. The enclosure must be built to IBC standards and must be provided with proper certifications proving so. Enclosure must be designed to be ship disassembled with any one piece weighing no more than 40 tons and having a maximum dimension of 13'W x 74”L including any shipping skids, trailers etc. Include break down of the enclosure after testing.

B. Doors: Doors shall not exceed 36” in width. All doors on the enclosure shall be strategically located in areas as to allow ease of maintenance on the generator set and allow good access to and visibility of instruments, controls, engine gauges, etc. The doors shall be fitted with stainless steel bolt on, lift off hinges with pins of a diameter not less than .375”. Each door shall be fitted with flush-

mounted, key lockable latches keyed alike. The latch hardware shall allow escape from within when locked externally. Door holdback hardware shall be provided to secure the door to the enclosure wall during installation and maintenance. All doors shall be Gasketed to prevent leaks. Provide five (5) sets of keys for each door lock.

C. Roof: The roof of the enclosure shall meet or exceed the minimum thickness requirements specified, but in addition, shall be strengthened by utilizing 3/16" thick aluminum trusses. The roof must be covered with a rubber membrane to prevent any water intrusion.

D. SCR Platform: A platform shall be provided around the SCR reactor housing providing working clearance for the reactor. Platform shall provide access to exhaust stack test ports in compliance with San Diego Air Pollution Control District requirements.

E. Ships ladder to be provided, allowing for easy access to SCR platform above the enclosure. Ships ladder to be mounted securely to outside edge of tank or enclosure and able to support a minimum of 350lbs.

F. Cooling: Under no circumstances shall the floor area or any of its parts be considered for cooling air intake or discharge requirements of the generator set or its associated equipment.

G. Working Clearance: The base and enclosure assembly shall allow room within the package to mount and maintain the specified battery charger, engine starting batteries, racks and cables, engine-generator control panel, and other items as specified or as shown on the drawings. Code required working clearances about the genset shall be provided.

H. Sound Attenuation: The entire enclosure except for the louvered openings shall have acoustic material installed on the interior roof and wall panels of a weight and thickness consistent with the specified level of noise reduction. The acoustic material shall be held in place by aluminum perorated metal sheeting to form a removable section easily inspected by maintenance personnel. The enclosure package shall be designed to achieve a 75 dB(A) sound level when measured at a distance of 5 feet from any point around the perimeter of the enclosure at 5 feet above grade based on free-field environment Paint: The enclosure shall be spray finish utilizing (2) coats of rust-inhibiting primer and finished with a minimum of two (2) coats of polyurethane. Final color of finish coat will be selected at shop drawing review.

I. Enclosure Power: The enclosure shall be equipped with a minimum 100-amp 480:120/208, 3 phase mini-power zone including a 45 kVA transformer to power the generator jacket water heaters, battery charger, lighting, receptacles, etc., as specified and as shown on the drawings. The placement of this equipment shall be shown on the submittal drawings. All internal conduit and wiring to the ancillary equipment shall be supplied within the package and shall be pre-wired by the enclosure manufacturer in accordance with all governing codes pursuant to this application. The Load Center is to be supplied complete with bolt-in circuit breakers, as required, to complete system. Enclosure electrical package shall include but not limited to the following:

1. (6) Vapor-proof LED lights

2. (2) Vapor-proof interior emergency LED 2-head lights with battery backup.

3. (2) 3-Way light switches

4. (3) GFCI receptacles

5. Ventilation fan(s) with thermostat

6. (4) Exterior LED lights with photocell and override local (2) switches

7. (6) Ceiling mounted heat detectors, (2) manual wall mounted pull stations, (2) wall mounted horn/strobe units

8. (3) Roof mounted vapor proof flashing beacons

9. (2) Emergency stop buttons, externally mounted with nameplates

10. (4) 5 lb CO2 fire extinguishers

J. Internal Wiring: All wiring (type THHN-2, 90°C.) within the enclosure shall be in conduits made from galvanized rigid metal material specifically manufactured for electrical use. All connections at the generator set shall be liquid tight flexible conduits, and all shall be provided and installed by the enclosure manufacturer.

K. Airflow

1. Intake/exhaust fans

a. Quantity as required for combustion, ventilating, and radiator cooling air

b. Mounted to the enclosure air intake and air exhaust

c. Variable frequency drive controlled

L. Enclosure Air Intake: Sound attenuated fixed louvers shall be utilized on the exterior of the enclosure. Air will then go through sound attenuated baffling then through motorized 120 VAC fail-safe dampers into the main enclosure compartment. All louvers shall be designed to help prevent the entrance of driving rain water, but shall have sufficient free area to allow for engine-generator cooling air requirements. Bird screen shall cover entire air intake opening

M. Enclosure Air Exhaust: Engine radiator shall exhaust through gravity dampers into an integral acoustical exhaust plenum. The exhaust plenum shall be incorporated into the design of the enclosure to maintain a square building type appearance. Bird screen shall cover entire air exhaust opening. Exhaust air shall exit thru the top of the container.

N. Insulation material is to be mineral wool held in place with an aluminum perforated metal liner

O. Enclosure Flooring: The floor of the enclosure shall be designed and constructed in such a manner as to prevent the entrance of rodents. This shall be accomplished with diamond plate. The floor must also be provided with fluid containment greater than the capacity of the cooling system. The enclosure floor must be capable of fully supporting any ancillary equipment specified which may be secured to it. The flooring must also accommodate the anticipated weight of maintenance personnel and their tools.

P. Weight: The weight of the entire unit consisting of generator set, enclosure and other specified items including all liquids (i.e., fuel oil and cooling solutions) shall be calculated by the enclosure manufacturer. The base of the unit shall be designed and manufactured as a heavy duty, structural steel construction with lifting provisions to support the calculated weight.

Q. Exhaust Silencer: Silencer must be provided to maintain the enclosure sound level. Exhaust system to include; one Stainless Steel wye-pipe flexible exhaust inlet, Insulated Silencer, mating flanges, gaskets, etc. as required. Silencer exit piping, thimbles, rain cap, etc. resulting in one complete exhaust system must be included and supplied by enclosure manufacturer. Exhaust system to be supported completely and only from roof or sides of enclosure, at no point shall the silencer weight be supported by the engine thus preventing potential damage to engine outlet turbo(s) or exhaust manifold, due to excessive weight of components. All interior exhaust components to be covered in 2” thick calcium silicate blankets.

R. Rain Skirt: At the point where the exhaust pipe penetrates the roof of the enclosure, a suitable “rain skirt: and collar shall be provided by enclosure manufacturer. It shall be designed to prevent the entrance of rain yet allow for expansion and vibration of the exhaust piping without chafing or stress to the exhaust system.

S. Wiring and Connectors: All conduits, wire, cables, interconnections, etc., entering or exiting the generator enclosure shall be furnished and installed by the installing contractor. All wiring shall be in conduits sized in accordance with the NEC with San Diego Amendments. All power and control wiring shall be installed for a complete and operating system. All floor openings to accommodate underground conduits shall be as required based on contract drawings showing number and size of all power and communication conditions. Enclosure vendor shall make all required openings in the enclosure floor to accommodate all required power and communication conduits shown on drawings.

T. Color: Enclosure vendor shall provide a minimum of 10 colors for the owner / architect to select.

U. Provide two (2) welded ground connection lugs on each side of the enclosure at the engine base.

2.5 RADIATOR MOUNTED LOADBANK

A. The system shall be a UL listed, radiator style resistive load bank using the air discharge from the generator radiator for cooling.

B. Ratings

1. The total capacity of the load bank shall be rated (125) KW at (208) Volts, 3-Phase, 3-Wire, 60 Hertz, at unity Power Factor.

2. The load step resolution shall be a nominal 20% of the load bank rating.

3. The load bank shall be designed for continuous duty cycle operation with no limitations.

4. Radiator/Duct mounted load banks are designed as a supplemental load to the generator set and shall be sized at 50-60% of generator nameplate KW rating (not 100%).

C. Material and Construction

1. The load bank shall be suitable for installation on the generator radiator core, or within the radiator exhaust ductwork.

2. Due to the high radiator exhaust from the generator, the load bank shall be constructed of heavy gauge aluminized steel per ASTM A463. Aluminized steel provides superior corrosion protection and extended service life, with a better tolerance to high heat exposure compared to the more common Galvanized steel.

3. The main input load bus, load step relays, fuses and control relays shall be located within the load bank enclosure.

4. The load bank shall be sized to mount to the radiator core with a self-contained 2” flange on the top and bottom edges for mounting. Load banks with a depth of 13” shall have provisions for overhead lifting and duct adaptors.

5. The load bank shall be designed for installation and operation indoors. All exterior fasteners shall be stainless steel.

D. Resistive Load Elements

1. Load elements shall be Avtron Helidyne™, helically wound chromium alloy rated to operate at approximately ½ of maximum continuous rating of wire. Elements must be fully supported across the entire length within the air stream by segmented ceramic insulators on stainless steel rods. Element supports shall be designed to prevent a short circuit to adjacent elements or to ground.

2. The change in resistance due to temperature shall be minimized by maintaining conservative watt densities.

3. The overall tolerance of the load bank shall be –0% to +5% KW at rated voltage. A –5%, +5% rating allows the load bank to deliver less than rated

KW and shall not be used. The load bank must deliver full rated KW at rated voltage.

4. Sealed wire type elements (which have the internal resistance wire totally enclosed) prevent internal cooling of the element wire and shall not be used.

E. Protective Devices

1. An over-temperature switch shall be provided to sense the load bank exhaust. The switch shall be electrically interlocked with the load application controls to prevent load from being applied in the event of an over temperature condition.

2. To provide for major fault protection, branch fuses shall be provided on all three phases of switched load steps above 50KW. Branch fuses shall be current limiting type with an interrupting rating of 200K A.I.C.

3. The exterior of the load bank shall have appropriate warning/caution statements on access panels.

F. Control Panel

1. The control panel shall be a local panel mounted on the load bank. The control panel shall contain the following manual controls:

   a. Power ON/OFF switch

   b. Master load ON/OFF switch.

   c. Load step switches for ON/OFF application of individual load steps.

2. Control panel visual indicators shall be as follows:

   a. Power ON indication light.

   b. Over-temperature light.

3. A standard remote load dump circuit shall be provided as part of the load bank control circuit. Provisions shall be provided to remove the load bank off-line from the operation of a remote normally closed set of auxiliary contacts from a transfer switch or other device. In the event of the remote contact opening, all load is removed.

4. Remote 19” control panel housed in a NEMA 4 type wall mount enclosure shall be provided.

5. An Automatic Load Step Controller shall be provided for maintaining a minimum load on the generator set. The controller shall monitor the connected downstream loads and will automatically add or subtract load steps in response to building load changes as to maintain a minimum

load level on the generator set. The controller includes an initial time-delay circuit, and automatic time delayed load step application circuit. A remote contact closure is required for activation and transfer of control. A separate current transformer shall be supplied loose for mounting and sensing of downstream loads.

6. (OPTIONAL) An integral control power transformer shall be provided to supply 120V, 1 phase, 60 Hz to the load banks control and safety circuitry. Transformer primary and secondary control circuits shall be fuse protected.

PART 3 - EXECUTION

3.1 PREDELIVERY TESTING

A. Each engine, generator, and generator set shall be subjected to production performance tests and quality controls to insure reliable operation. These tests and controls shall include but not be limited to:

1. Specific observances of engine blowby, slobber, combustion gas leaks, inlet air leaks, excessive vibration, and unusual noise.

2. Fuel system setting confirmation, which shall not be altered to rectify nonconformance to, established performance specifications.

3. Retest after any change affecting airflow through the engine, fuel injected into the engine, engine combustion, or any reassembly which potentially affects mechanical integrity.

B. Periodic extended tests to confirm baseline data.

C. Recording of:

1. Engine RPM

2. Frequency

3. Average voltage

4. Line to line voltages, all three phases

5. Average current

6. Line currents for all three phases

7. Observed power

D. Readings to be taken at 0.8 Power Factor

E. The generator set supplier shall provide test reports to the owner upon successful completion of the test.

F. Optional Witness Test

1. Load bank testing shall be done in the presence of the owner's engineer or his appointed representative. All travel and lodging expenses for attendees shall be included in this contract for the factory test. Testing shall be for a minimum of four (4) hours under full load.

G. All safety shutdown and pre alarm functions shall be tested to demonstrate their functionality.

H. Test transient response of genset by loading gensets in 20% load increments up to 100%

I. All transient load steps must be recorded on a chart recorder or light beam oscilloscope to verify generator set operation meets criteria.

J. Load testing shall be performed as follows:

1. In a period of four (4) hours with a loading of 100 percent of rated load at unity power factor. The following readings shall be taken at 15 minute intervals:

a. Voltage

b. Amperage (3 phase)

c. Frequency

d. Oil pressure

e. Water temperature

f. Ambient temperature

g. Kilowatts

K. The generator set supplier shall provide test reports to the owner upon successful completion of the test.

L. The bidder shall furnish all consumables necessary for testing. Any defects, which become evident during the test shall be corrected by the bidder at his own expense prior to shipment to the jobsite.

3.2 INSPECTION

A. Examine areas, equipment bases, and conditions, with installing Contractor present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.

B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. The installation shall be performed in accordance with shop drawings, specifications, and the manufacturer's instructions, and with recognized industry practices, to ensure proper performance in accordance with the specifications. Comply with applicable NEMA standards pertaining to installation of engine-generator sets and accessories and with NFPA 110.

B. Provide enclosure manufacturer's site personnel to supervise reassembly of the enclosure as well as provide engine manufacturer's certified technicians to perform reassembly of the generator set on site to maintain integrity of the product and warranty.

C. Coordinate with the work of other trades including piping, breeching, post exhaust treatment and accessories as necessary to provide a complete operational system.

D. Include the installation of control and monitoring and power panels, battery charger, integral tank, batteries and racks and other appurtenances to the extent that such appurtenances are not factory installed and wired.

E. Include field inter wiring and power supply and control connections for load bank, batteries, battery chargers, pumps, heaters, float switches, solenoid valves, damper operators and other miscellaneous items as required in accordance with manufacturers wiring diagrams. Such wiring shall include (but not be limited to):

1. Wiring between battery and engine control panel and battery charger and power supplies thereto.

2. Power supply wiring and control wiring for engine jacket water heater.

3. Power supply wiring and control wiring for fuel pumps, integral fuel tank, float switches, valves and other fuel supply system components.

4. Power supply and control wiring for automatic louver damper operators.

5. Emergency stop break glass switch match type and number of cables and conductors to control, and communications requirements of transfer switches as recommended by manufacturer.

F. Ground equipment.

3.4 FIELD QUALITY CONTROL

A. The complete installation shall be checked for procedural and operational compliance by a representative of the system manufacturer's authorized local dealer. The engine lubricating oil and antifreeze, as recommended by the system manufacturer, shall be provided by the generator set dealer. If different manufacturers furnish switchgear and generator sets, technical representatives of both manufacturers' authorized dealers shall verify the installation meets requirements. Any deficiencies shall be noted and corrected by the Contractor.

B. The system manufacturer's dealer representative shall be present to assist the Contractor during start-up, systems check, adjusting, and any site testing required after the installation is complete.

3.5 POST-INSTALLATION TESTING

A. Following installation, the following tests shall be performed by the system manufacturer's local dealer representative(s) in the presence of the owner's engineer or designated appointee:

B. Prestart Checks:

1. oil level
2. water level
3. day tank fuel level
4. battery connection and charge condition
5. air start supply pressure (if so equipped)
6. engine to control interconnects
7. engine generator intake/exhaust obstructions
8. engine room ventilation obstructions
9. removal of all packing materials

C. Operation

1. Load - Four hours operation at 100% of full load rating. After the first fifteen minute stabilization period at full load, the following shall be recorded at fifteen-minute intervals:
    a. Voltage and amperage (3 phase), frequency
    b. Fuel pressure, oil pressure and water temperature
    c. Exhaust gas temperature at engine exhaust outlet
    d. Ambient temperature
2. If equipped with appropriate instrumentation:
    a. Kilowatts
    b. Power Factor
    c. KVARS
    d. Generator Temperature

3. Proper operation of controls, engine shutdown, and safety devices shall be demonstrated.

D. The manufacturer's representative shall provide resistive load banks and field engineer for the test. Building load shall not be used.

E. Upon satisfactory completion of the load bank test, a pull the plug building test shall be performed utilizing building load and all equipment associated with the emergency generator set system.

F. Should these tests indicate that the equipment does not meet the specified performance requirements, National Electric Code and Local codes, the cost of all corrective measures shall be borne by the manufacturer's representative.

3.6 TRAINING

A. The system manufacturer's authorized dealer shall provide a complete training for the owner's engineering and maintenance personnel. Training shall include both classroom and hands-on instruction. Topics covered shall include control operation, schematics, wiring diagrams, meters, indicators, warning lights, shutdown system and routine maintenance.

B. Provide 2 days of on-site training (one day- 8 hours during regular working hours and one day- 8 hours during off hours) to instruct the owner's personnel in the
proper operation and maintenance of the equipment. All training shall be recorded by professional videographer and shall provide electronic copies of the training to owner. Review operation and maintenance manuals, parts manuals, and emergency service procedures.

3.7 SERVICE MANUALS AND PARTS BOOKS

A. The system manufacturer's authorized local dealer shall furnish one copy each of the manuals and books listed below for each unit under this contract:

1. Operating Instructions - with description and illustration of all switchgear controls and indicators and engine and generator controls.

2. Parts Books - which illustrate and list all assemblies, subassemblies and components, except standard fastening hardware (nuts, bolts, washers, etc.).

3. Preventative Maintenance Instructions - on the complete system that cover daily, weekly, monthly, biannual, and annual maintenance requirements and include a complete lubrication chart.

4. Routine Test Procedures - for all electronic and electrical circuits and for the main AC generator.

5. Troubleshooting Chart - covering the complete generator set showing description of trouble, probable cause, and suggested remedy.

6. Recommended Spare Parts List - showing all consumables anticipated to be required during routine maintenance and test.

7. Wiring Diagrams and Schematics - showing function of all electrical components.

B. All manuals and books described above shall be contained in rigid plastic pouches.

3.8 TESTING

A. After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with all specified features in the presence of the Engineer using acceptance procedures provided by the manufacturer.

3.9 CLEANUP

A. Touch-up damage to painted finishes.

B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

C. Clean area around equipment installation and remove packing or installation debris from job site.

D. Notify Engineer for acceptance inspection.

PART 4 – ATTACHMENTS

4.1 Data Sheets for Generator System

ATTACHMENT NO. 1 - ENGINE/GENERATOR PERFORMANCE DATA SHEET

E N G I N E

Engine Continuous Capacity	kW	1,000
Electrical efficiency		*
Manufacturer / Model No.		*
Type		Reciprocating Gas Engine
Lubrication		Oil
Exhaust (flue) gas temperature at 100% load	° F	*
Exhaust (flue) gas temperature at 75% load	° F	
Exhaust (flue) gas temperature at 50% load	° F	
Exhaust (flue) gas temperature at 30% load	° F	
Exhaust gas flow (dry)	lb/hr / SCFM	*
Engine Starter type:		Electric Battery *
Engine Jacket Cooling	Btu/hr- In-Out temp.° F	*
Engine Lube Oil Cooling	Btu / hr- In-Out temp.° F	*
Percentage Propylene Glycol Mixture fluid	%	*

G E N E R A T O R

Generator Continuous Capacity/Nominal Power output		1000 kW /1000kW
Manufacturer / Model No.		* / *
Type		Permanent Magnet
Lubrication		*
Power factor:		0.8 PF
Voltage:		480V
Amps:		* amps
Frequency:		60 hz
Poles		*
Phase		3 phase
RPM:		*
Connection:		*
Pitch:		*
Insulation class		"H"
Excitation Requirements		
Efficiency At Full Load		*
Reactances (% at KVA rating)		*
Direct axis synchronous reactance;		*
Direct axis transient reactance:		*
Direct axis sub-transient reactance:		*
Short circuit current values:		*
Three phase:		*
Line to Line:		*
Line to Neutral:		*
Electrical data		*
Auxiliary power requirements		*
Space heaters (Watts & Volts):		*
Cooling fan(Watts & Volts):		*
Total Weights:		*
Shipping / Erection	Lbs	*
Operating / Flooded	Lbs	*
Overall Dimensions		*

Note: Supplier to Confirm all listed information and to furnish information marked with ***

ATTACHMENT NO. 2 – EMISSIONS AND FUEL

EMISSION REQUIREMENTS ON DISCHARGE OF THE Generator

ALL CONCENTRATIONS BELOW CORRECTED TO 3% OXYGEN ON A DRY BASIS	TECHNICAL DATA	
	gr/BHP-Hr	PPM
NOx:	1.0	82
CO:	2.0	270
VOC:	0.7	60

Minimum efficiency at 100% capacity at 15 percent excess air at 5 percent excess air.		

FUEL – NATURAL GAS

Fuel Pressure Required at the Engine: Psig	0.5-5
Natural Gas Firing Rate at Engine: SCFM	*
Fuel Oil Firing Rate: GPH (MAX/MIN)	Not Applicable
Natural Gas heat value (HHV) Min/Max Btu/scf	990/1150
Turn Down	30%
Jacket water heat rejection Btu/Hr	*
Oil cooler heat rejection Btu/Hr	*
Heat rejection to atmosphere Btu/Hr	*
Location: ( ) Indoors (x) Outdoors	

ATTACHMENT NO. 3 – ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT

DESCRIPTION	INFORMATION	DESCRIPTION	INFORMATION
Power	480V, 3 ph., 3 wire, 60 Hz	**Lighting:**	By Supplier as defined in Specification.
Area Classification Per NEC & FM Supplier shall confirm Rating of equipment	Class: General Purpose Division: Group: Temp Rating	**Heat Tracing**	NA
Motors	480V, 3 ph, 60 Hz, TEFC, severe duty, energy efficient, type per motor data sheet	**Electr. Equipment Nameplates**	White lamicoid with black lettering. Screwed in place
Grounding	Skid - Ground Lugs on frame by Supplier Motors – Separate ground conductor with power supply	**Control System**	By Supplier as defined in Specification.
Control Power	Derived by Supplier from engine batteries	**Convenience Receptacles:**	By Supplier as defined in Specification.
Raceway and Fittings	Rigid galvanized steel unless otherwise required	**Wiring**	Flame retardant, UL VW-1
Motor Controllers	By Supplier	**Control Terminations**	Spade
Branch Feeders	By Supplier	**Wire numbers**	Yes
Equipment Enclosures and Control Stations	NEMA 12, unless otherwise required	**Certifications:**	UL listed components
		Documentation:	Power requirements/ load summary, single line diagram, schematics, panel layouts, interconnect wiring

			diagrams, bills of materials, raceway routing, and test reports

END OF SECTION

SECTION 26 37 13

MICROGRID ENERGY MANAGEMENT SYSTEM

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:

1. Provide labor, material, equipment, related services, and supervision required, including, but not limited to, manufacturing, fabrication, configuration and installation for low voltage Microgrid Energy Management System (also identified as MEMS, Microgrid EMS, Energy Control Center, ECC, Microgrid PCS, Microgrid Power Control System, Distributed Energy Resources Power Control System or DER PCS) as required for the complete performance of the Work, as shown on the Drawings and as specified herein.

2. The low voltage Microgrid Energy Management System shall be provided by a qualified MEMS system supplier. The Contractor shall ultimately be responsible for the MEMS and shall supplement the system supplier's Work as necessary to provide a complete and operable system. The Contractor shall coordinate the equipment and systems provided by others that interface with the MEMS to ensure necessary interconnections and compatibility are provided for the required functionality of the MEMS:

3. MEMS system shall control the following equipment and as indicated in the drawings. System requirements outlined in this specification may need to be revised based on the final work package selected by the Owner as described below. The resources that need to control are as follows:

a. The breakers for the eight (8) DC electric vehicle supply equipment (EVSE) at Substation B North and the breakers for the eight DC EVSEs at Substation B South. A separate charger management system (CMS) would be required to control and receive data from the individual EVSEs.

b. A permanent stationary generator connected to Substation A. MEMS shall include all equipment & installation labor necessary to monitor & control stationary generator. Contractor shall coordinate with generator supplier as necessary.

c. the 1 MWh/500 kW battery energy storage system (BESS) and its respective breakers connected to the Substation A low voltage switchboard. MEMS shall include all equipment & installation labor necessary to monitor & control the battery energy storage system. Contractor shall coordinate with battery energy storage system as necessary.

d. the breakers to the two solar photovoltaic systems and their respective inverters connected to Substation B. MEMS shall include all equipment & installation labor necessary to monitor & control the solar PV system.

e. the utility feed breaker in the medium voltage switchgear.

B. Related Sections: Related sections include but shall not be limited to the following

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

2. Applicable general requirements for electrical Work specified within Division 26 Specification Sections apply to this Section.

3. Refer to the following Specifications for additional requirements

a. Section 26 24 13.11 Switchboards

b. Section 26 11 16 Secondary Unit Substation

c. Section 26 24 16.33 Panelboards

d. Section 26 12 16 Substation Transformers – Dry Type

e. Section 26 13 13 Metal Enclosed MV Switchgear

f. Section 26 31 00 Photovoltaic System

g. Section 26 31 01 Battery Electrical Supply System

1.2 REFERENCES

A. General Publications: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified:

1. Institute of Electrical and Electronics Engineers (IEEE)

a. IEEE 1547, “IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

b. IEEE 2030.7, “Standard for the Specification of Microgrid Controllers”

c. IEEE 2030.8, “Standard for the Testing of Microgrid Controllers”

2. International Organization for Standardization (ISO):

a. ISO 9001, “Quality Management Systems – Requirements”

3. National Fire Protection Agency (NFPA):

a. NFPA 70, “National Electrical Code”

b. NFPA 70B, “Electrical Equipment Maintenance

c. NFPA 70E, “Standard for Electrical Safety in the Workplace

4. Underwriters Laboratories, Inc. (UL):

a. UL67, “Standard for panelboards”

b. UL 98, "Standard for Enclosed and Dead Front Switches

c. UL 489, "Standard for Molded Case Circuit Breakers and Circuit Breaker Enclosures."

d. UL 891, "Standard for Dead Front Switchboards

e. UL 943, "Standard for Ground Fault Circuit Interrupters

f. UL 1283, “Standard for Safety for Electro Magnetic Interference Filters

g. UL 1449, "Standard for Surge Protective Devices

h. UL 1741, “Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources

i. UL 1741 SA (Supplement A), “Advanced Inverter Testing

5. International Electrotechnical Commission (IEC):

a. IEC 61850, “Power Utility Automation”

1.3 MEASUREMENT AND PAYMENT

A. This item shall be included in lump sum cost for Unit Substations.

1.4 DEFINITIONS

A. Unless specifically defined within the Contract Documents, the words or acronyms contained within this specification shall be as defined within, or by the references listed within this specification, the Contract Documents, or, if not listed by either, by common industry practice.

1. BESS: Battery Energy Storage System

2. DER: Distributed Energy Resource (e.g. generators, PV arrays, BESS, etc.)

3. ECC: Energy Control Center

4. HMI: Human Machine Interface

5. MEMS: Microgrid Energy Management System

MTS - South Bay Maintenance Facility Power Backup and Photovoltaic Panel Install

6. PV: Photovoltaic (e.g. solar electric)

1.5 SUBMITTALS

A. General: Submittals shall be in accordance with the requirements specified herein.

1. Submit sufficient information to determine compliance with the Contract Documents. Identify submittal data with the specific equipment tags and/or service descriptions to which they pertain. Submittal data shall be clearly marked to identify the specific model numbers, options, and features of equipment and work proposed.

2. Deviations from the Contract Documents shall be indicated within the submittal. Each deviation shall reference the corresponding drawing or specification number, show the Contract Document requirement text and/or illustration, and shall be accompanied by a detailed written justification for the deviation.

3. Submit required product data and shop drawings specific to each product and accessory proposed. [In addition, include the following information

a. System Architecture Diagram

b. MEMS Sequence of Operations

c. Unwitnessed Factory Acceptance Test report submitted prior to shipment.

B. Operation & Maintenance (O&M) manuals shall be provided in accordance with the minimum requirements specified in Section 01 78 23 Operation and Maintenance Data, Section 26 00 10 Electrical Requirements and additional requirements specified herein

1. Submit required Operations & Maintenance data specific to each product and accessory proposed.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of specified products of types and sizes required.

1. The manufacturer shall have a valid ISO 9001 certification and an applicable quality assurance system that is regularly reviewed and audited by a third-party registrar. Manufacturing, inspection, and testing procedures shall be developed and controlled under the guidelines of the quality assurance system.

2. The manufacturer or their representative shall have service, repair, and technical support services available 24 hours 7 days a week basis.

B. Installer Qualifications: Installer shall be a firm that shall have a minimum of 5 years of successful installation experience with projects utilizing equipment similar in type and scope to that required for this Project and shall be approved by the manufacturer's representative.

C. All work performed and all materials used shall be in accordance with the National Electrical Code, and with applicable local regulations and ordinances. Process controllers, assemblies, materials, and equipment shall be listed and labeled by Underwriter's Laboratories or by a testing agency acceptable to authorities having jurisdiction and marked for intended use.

1.7 DELIVERY, STORAGE AND HANDLING

A. Prior to delivery to the Project site, ensure that suitable storage space is available to store materials in a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, and corrosive atmospheres. Materials shall be protected during delivery and storage and shall not exceed the manufacturer stated storage requirements. As a minimum, store indoors in clean, dry space with uniform temperature to prevent condensation. In addition, protect electronics from all forms of electrical and magnetic energy that could reasonably cause damage.

B. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and equipment tag number or service name as identified within the Contract Documents.

C. Inspect and report any concealed damage or violation of delivery storage, and handling requirements to the Engineer.

1.8 WARRANTY

A. General: Refer to Section 01 77 00 - Closeout Procedures

B. The manufacturer shall warrant products against defects in material and workmanship for [12 months from the date of commissioning or 18 months from the date of shipment – whichever comes first.][24 months from the date of commissioning or 36 months from the date of shipment, whichever comes first, provided that the manufacturer performs functional testing, commissioning and first parameter adjusting of equipment.] During the warranty period the manufacturer shall repair or replace defective products. This warranty shall be in addition to any provided by the Contractor. The warranty shall exclude normal wear and tear under normal usage and any damage caused by abuse, modification, or improper maintenance by entities other than the manufacturer or its approved representative.

C. Additional Owner Rights: The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

1.9 SPECIAL TOOLS AND SPARE PARTS

A. The Contractor shall provide a recommended spare parts list with the following information provided as a minimum:

1. Contact information for the closest parts stocking location to the Owner.

2. Critical spare parts shall be identified as those parts being associated with long

lead times and/or those being critical to the unit's operation.

3. Maintenance spares shall be identified as being those parts required to regularly perform scheduled maintenance on the furnished equipment. These spares shall include, but shall not be limited to, consumable spares that are required to be exchanged during scheduled maintenance periods.

B. Spare parts shall be provided for each type and size of unit installed. At a minimum, the following shall be provided:

1. Provide the minimum spare parts recommended by the manufacturer.

2. Provide [1] set of each type of power and control fuse installed within equipment

C. Any manufacturer specific special tool, not normally found in an electrician's toolbox, required to remove and install recommended or furnished spare parts shall be furnished. At a minimum the following shall be provided:

1. If available from manufacturer, provide PC-based configuration software tool and a minimum of one communication interface cable for each type of cable required to connect a PC-based computer to the devices specified herein for configuration and programming.

2. Electronic configuration files, in a media format acceptable by the Owner (e.g. CD, USB stick, etc.), updated to an as-installed and commissioned state.

D. Spare parts shall be properly marked and packaged for long term storage. Printed circuit boards shall be provided in separate anti-static containers.

1.10 PRODUCT MANUFACTURERS

A. Example Product Manufacturers: Products and manufacturers specified are to establish a standard of quality for design, function, materials, and appearance. Products shall be modified as necessary by the manufacturer for compliance with requirements. The listed manufacturers are provided for example only and are not intended to represent all qualified manufactures. Contractor may select an alternate manufacturer provided the product(s) comply with all design requirements.

- Eaton (basis for design)
- ABB
- Schneider Electric

1.11 GENERAL REQUIRMENTS

A. LV Microgrid Energy Management System (MEMS) shall consist of one or more of integrated power distribution equipment (e.g. unit substations, power panels, switchgear, switchboards) items with the required HMI interface(s), microgrid controller(s), communications interfaces, relays, communications converters, communications switches, electrically operated circuit breakers, etc. to perform the required functionality, such as the control and operation of DERs per the sequence of

MTS - South Bay Maintenance Facility Power Backup and Photovoltaic Panel Install operations, as specified in Section 1.17.

B. The integrated power distribution equipment bus shall be rated as shown on the Drawings and as described in related specification sections.

C. MEMS integrated power distribution equipment shall be constructed in accordance with UL891.

D. The enclosure rating of the MEMS integrated power distribution equipment shall be NEMA 3R. The equipment shall have separate sections for power and controls with a minimum of one for power distribution (e.g. breakers) and one for control hardware, HMI, and auxiliaries (e.g. 24 Vdc power supplies).

E. All main circuit breakers utilized within the MEMS for control shall be electrically operated and capable of being opened and closed by commands over the MEMS Ethernet network. Branch circuit breakers used to supply battery electric bus charging circuits shall at a minimum be capable of being shunt-tripped by the MEMS with manual reset. The circuit breakers should also allow for manual operation.

1.12 All medium-voltage circuit breakers and low voltage main circuit breakers as shown on the Drawings or required for MEMS specified functionality shall have electronic trip units capable of reporting real power (P), reactive power (Q), voltage, frequency, and current over the MEMS Ethernet network. Service Entrance Requirements

A. When the MEMS is serving as the utility service entrance, the system shall include the following:

1. The MEMS shall provide utility pull section(s) within the integrated power distribution equipment. Refer to section 26 13 13 Medium Voltage Switchgear for details.

2. The MEMS shall provide utility metering and current transformers (CT's) within the integrated power distribution equipment. Equipment drawings & specifications shall be approved by San Diego Gas & Electric, and installation shall be coordinated with San Diego Gas & Electric.

3. The MEMS shall include protective relaying to comply with local utility requirements for the parallel operation of distributed energy resources with the electric utility distribution system.

1.13 SYSTEM REQUIREMENTS

A. Communications: The MEMS shall provide Ethernet connections and accept a mixture of standard SCADA Protocols, such as DNP3, Modbus, or IEC 61850 interface for communications to the DERs, circuit breakers, meters, etc. as needed for monitoring and control. The Ethernet network shall be a secure private network capable of being integrated into the existing Building Management System or Charge Management System by the Owner at a later date. Connections between unit substations shall be via multimode fiber for DERs in Substation A and copper for the DERs in Substation B. The type of connectors will be determined by the final equipment selected and design.

B. Monitoring: The MEMS shall include an HMI display, indicator lights and an AUTO-MANUAL selector switch for operator interface of the system. These interfaces shall provide the following:

1. Status indicators
2. One-line diagram showing circuit breaker arrangement, service and status
3. Power, reactive power, voltage, frequency, and current measured by each breaker or meter
4. Status of each load breaker
5. Key information available from DERs, such as power output and status
6. Pertinent alarms, such as breakers tripped for overcurrent or loss of utility feed power
7. Pertinent events, such as breakers opened or closed by commands from the touchscreen or manually, to be stored as a Sequence of Events (SOE)
8. Trends of key measurements, such as power measured by a breaker vs time, minimum of 1 month trend window required.
9. Secured data export capabilities of all stored data

C. Utility Requirements: The MEMS shall be able to comply with a utility requirement to have zero export power and minimum import power. To achieve this compliance, the system shall send commands to decrease the power output from DERs, curtailing output of the PV inverters, and/or send commands to the power flowing into energy storage devices to follow the real-time loads of the individual battery electric vehicle chargers.

D. Resiliency: In the event of a sustained utility grid power outage, the MEMS shall follow the Sequence of Events as detailed in Section 1.17. At any point in time, the MEMs should have the capability to be manually overridden at specific sections of the system.

1. Substation A and B should have clear signage and separate physical buttons for operators to stop the MEMs from controlling specific separate sections of the grid. For example, if manual override is initiated at Substation B, Substation A should not be affected and continue to be controlled by the MEMs and vice versa.
2. After the button is pushed, the operators should have the ability to manually configure the onsite system. When coming back online, the MEMs shall wait for 1 min before resuming normal operations.

1.14 Economic Optimization of Distributed Energy Resources

A. The MEMS shall include the capability to utilize a service integrated for dispatch of DERs for economic optimization according to local utility requirements (e.g. to

MTS - South Bay Maintenance Facility Power Backup and Photovoltaic Panel Install

maximize Return on Investment). The System shall be capable of running multiple use cases simultaneously. The following services shall include:

1. Remote Monitoring, Forecasting, and Data Storage: monitoring power, energy, and other KPI's for each DER using a web-based interface

2. Demand Charge Reduction (aka Peak Shaving): control DERs (consume/produce/store energy) to reduce peak consumption and resulting charges from utility

3. Self-Consumption: control energy storage to maximize energy consumed and charged directly from solar sources

4. Off Grid Preparation (aka Storm Hardening): control DERs to prepare for likely power outage events (e.g. due to storms)

1.15 Remote Notification of Alarms

A. The MEMS shall offer at least one of the following options for remote notification of alarms (e.g. breaker tripped due to overcurrent):

1. Email: The MEMS shall send an email to designated recipients in the event of an alarm.

2. SMS: The MEMS shall send an SMS to designated recipients in the event of an alarm.

3. Push Notifications: The MEMS shall use a push notification on a mobile app in the event of an alarm.

1.16 Multiple Anchor Resources While Islanding

A. When a MEMS has multiple DERs capable of serving as an anchor resource (e.g. generator and BESS capable of grid-forming mode), the system shall be capable of utilizing a preferred anchor resource over secondary anchor resource(s) within specified parameters.

1. The MEMS shall recognize when use of the primary anchor resource has gone outside the specified parameters (e.g. State-of-Charge below x%), and the system shall switch to a secondary anchor resource. The system will adjust load if necessary.

2. The MEMS shall recognize when the preferred anchor resource can again be utilized (e.g. State-of-Charge above y%), and the system shall switch back to the preferred anchor resource. The system will adjust load if necessary.

1.17 Sequence of Operations

The MEMs shall have five modes: automatic, manual (utility feed), manual (stationary generator), manual (mobile generator), and manual (no microgrid energy management system). The name of the breakers is detailed as below.

Power Source

- GEN-M BKR – mobile generator breaker on Substation B
- GEN-S BKR – stationary generator breaker (GEN-S) on Substation A
- PV1 BKR – PV inverter #1 on Substation B
- PV2 BKR – PV inverter #2 on Substation B
- BESS BKR – Battery Energy Storage System (BESS) on Substation A
- UTILITY BKR – utility feed breaker
- BL1 – Substation B main breaker after the secondary transformer
- AL4 – Substation A main breaker after secondary transformer

All BEB chargers' breakers

- BN1 BKR – BEB charger #1 breaker on northside of Substation B
- BN2 BKR – BEB charger #2 breaker on northside of Substation B
- BN3 BKR – BEB charger #3 breaker on northside of Substation B
- BN4 BKR – BEB charger #4 breaker on northside of Substation B
- BN5 BKR – BEB charger #5 breaker on northside of Substation B
- BN6 BKR – BEB charger #6 breaker on northside of Substation B
- BN7 BKR – BEB charger #7 breaker on northside of Substation B
- BN8 BKR – BEB charger #8 breaker on northside of Substation B
- BS1 BKR – BEB charger #1 breaker on southside of Substation B
- BS2 BKR – BEB charger #2 breaker on southside of Substation B
- BS3 BKR – BEB charger #3 breaker on southside of Substation B
- BS4 BKR – BEB charger #4 breaker on southside of Substation B
- BS5 BKR – BEB charger #5 breaker on southside of Substation B
- BS6 BKR – BEB charger #6 breaker on southside of Substation B
- BS7 BKR – BEB charger #7 breaker on southside of Substation B
- BS8 BKR – BEB charger #8 breaker on southside of Substation B

Scenario	GEN-M	GEN-S	PV1	PV2	BESS	UTILITY	BEBS
AUTOMATIC	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
MANUAL - UTILITY	OPEN	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED
MANUAL – STATIONARY GENERATOR	OPEN	CLOSED	OPEN	OPEN	CLOSED	OPEN	OPEN[1]
MANUAL – MOBILE GENERATOR	CLOSED	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN*

MANUAL – NO MEMS	**[2]	**	**	**	**	**	**

Assumptions:

- MEMs will operate as the charge management system in this draft of the sequence of operations.
- no closed transitions or sensitive loads accounted for in this draft
- If the stationary generator is out of service, avoid manual mode– stationary generator
- If the BESS is out of service, the BESS breaker should be opened and locked out and the PV inverters would need to operate in load curtailing mode
- If PV generation is out of service, the PV breakers should be opened and locked out.
- stationary generator includes integrated load banks which will be automatically engaged by the generator controls system to meet minimum loading requirements.
- This sequence of operation focuses on resiliency usage. however, the automatic modes include some peak shaving operations. the specific programming would depend on future modeling and load profile results which are not discussed in detail in this document.

A. Automatic Mode:

1. All on-site generation shall be limited to on-site usage and shall not be exported to the grid. MEMS shall provide signals to PV inverters to limit power production based on active loads and state of charge of BESS.

2. Stationary BESS shall be charged by PV system when available or by utility power during economically viable modes. BESS shall be discharged when

[1] BEB charger breakers shall be automatically opened to limit connected load to the capacity of the generator. after automatic opening the MEMS shall allow for manual control of BEBs breakers.

[2] **In Manual – The MEMS is not engaged at all. In this mode, the system shall not attempt to automatically control any circuit breakers or generation sources. all breaker operations shall be controlled by facilities staff.

economically viable (i.e. during "on-peak" utility periods, or to provide peak shaving service during high-demand periods).

3. Stationary generator may be energized and paralleled with utility feed to provide peak shaving service when economically viable. MEMS shall confirm generator synchronization with grid prior to closing in the stationary generator breaker (GEN-S).

During prolonged utility outage, in automatic mode, the MEMs

4. If the MEMS detect a prolonged utility outage, all BEBs breakers shall be opened. The MEMS shall begin to execute an open transition to on-site generation sources.

5. If the stationary generator is not energized, it shall be started and stabilized.

6. If the stationary generator is energized and paralleled for peak shaving, the generator breaker (GEN-S) shall be opened and generator shall be stabilized.

7. The Utility feed breaker (UTILITY) and PV generation (PV1 & PV2) and BESS breakers shall be opened.

8. Following generator stabilization, the generator breaker (GEN-S) shall be closed, energizing the bus.

9. PV generation and BESS shall be synchronized to the stationary generator. Following synchronization, the associated circuit breakers (PV1, PV2, & BESS) shall be closed.

10. Facilities staff shall manually close BEB charger breakers and activate charge sessions. A limited number of BEB chargers can be supported by the stationary generator, facilities operators shall monitor generator loading while conducting operations to maintain safe conditions. The MEMS shall automatically open BEB charger breakers if generator loading exceeds safe operations.

11. BESS shall be utilized to support BEB charger loads. once discharged, BESS charging shall be low priority and shall only occur if excess capacity is available from stationary generator or PV generations.

B. Manual (Utility Feed only) Mode

1. PV generation and stationary BESS systems shall be controlled to deactivate power usage. associated breakers shall be opened to prevent accidental energization.

2. All generator breakers shall be held in the open position.

3. Only the utility feed breaker (UTILITY) is closed.

C. Manual (Stationary Generator) Mode

1. if stationary generator is not energized, it shall be started and stabilized.

2. If stationary generator is energized and paralleled for peak shaving, the generator breaker (GEN-S) shall be opened, and generator shall be stabilized.

3. All BEBs breakers shall be automatically opened to limit connected load to the capacity of the generator. mems shall begin to execute an open transition to on-site generation sources.

4. Utility feed breaker (Utility) shall be opened and shall remain open until system is returned to automatic mode.

5. Following generator stabilization, the generator breaker (GEN-S) shall be closed, energizing the bus.

6. PV generation and BESS shall be synchronized to the stationary generator. following synchronization associated circuit breakers (PV1, PV2, & BESS) shall be closed.

7. Facilities staff shall manually close BEB charger breakers and activate charge sessions. A limited number of BEB chargers can be supported by the stationary generator, so facilities operators shall monitor generator loading while conducting operations to maintain safe conditions. The MEMS shall automatically open BEB charger breakers if generator loading exceeds safe operations.

8. BESS shall be utilized to support BEB charger loads. Once discharged, BESS charging shall be low priority and shall only occur if excess capacity is available from stationary generator or PV generation.

D. Manual (Mobile Generation – Substation B) Mode

1. The main breaker of Substation B (BL1) will be opened and shall remain open until the system is returned to automatic mode.

2. All BEB charger breakers (BEBS) shall be opened.

3. PV generation breakers (PV1 & PV2) shall be opened.

4. The MEMS shall take no action on the mobile generator connection breaker but will monitor the status. Manual action will be required to connect the mobile generator, energize mobile generator, and then close in the mobile generator connection breaker. Wait for mobile generators stabilization prior to engaging loads

5. MEMES shall control PV generation to synchronize to the mobile generator. manual engagement of PV generation shall be at the facilities' prerogative.

6. Facilities staff shall manually close BEB charger breakers and activate charge sessions a limited number of BEB chargers can be supported by the mobile generator, facilities operators shall monitor generator loading while conducting operations to maintain safe conditions.

E. Full Manual, No MEMS

1. The system shall not attempt to automatically control any circuit breakers or generation sources. all breaker operations shall be controlled by facilities staff.

F. Return to Automatic mode from Manual

1. Ensure all loads are open and disconnected.

2. Open the stationary generator breaker (GEN-S) and the mobile generator quick connect breaker (GEN-M). Start the stationary generator cooldown process.

3. PV generation and BESS shall be deactivated and circuit breakers (PV1, PV2, and BESS) shall be opened during this transition.

4. Close the utility feed breaker (Utility) re-energizing the system.

5. PV generation and BESS systems shall be synchronized to utility source and PV1, PV2, and BESS circuit breakers shall be closed in.

6. All BEB charger breakers (BEBs) shall be automatically closed. Charging sessions will be started manually.

PART 2 EXECUTION

2.1 GENERAL

A. In addition to the requirements specified herein, execution shall be in accordance with the requirements of specifications Section [26 00 10], Section [26 08 00] and Drawings.

B. Examine equipment exterior and interior prior to installation. Report any damage and do not install any equipment that is structurally, moisture, or mildew damaged.

C. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Engineer, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

D. Pre-Installation Conference: Prior to commencing the installation, an onsite pre-installation conference shall review the material selections, installation procedures, and coordination with other trades. Attendees shall include, but shall not be limited to, the Contractor, the Installer, manufacturer's representatives, and any trade that requires coordination with the work. Date and time of the pre-installation conference shall be acceptable to the Owner and the Engineer

E. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

F. Install equipment in accordance with reviewed product data, final shop drawings, manufacturer's written instructions and recommendations, and as indicated on the Drawings.

G. Provide final protection and maintain conditions in a manner acceptable to the manufacturer that shall help ensure that the equipment is without damage at time of Substantial Completion.

2.2 FACTORY ACCEPTANCE TESTING

A. The manufacturer shall perform a witnessed factory acceptance test prior to shipment. A test report shall be generated documenting the tests performed, assumptions, corrective actions and results. The test shall include the manufactures standard test procedures but shall include the following as a minimum:

1. Inspection and proper energization of components

2. Operational

    a. Transition from utility grid to islanded operation and return to utility grid operation

2.3 FIELD QUALITY CONTROL

A. Functional testing, commissioning, and first parameter adjusting shall be carried out by a factory-trained manufacturer's field service representative. This manufacturer's field service technician shall provide all material, equipment, labor and technical supervision to perform inspection, testing and adjustments to ensure equipment is installed, adjusted, and tested in accordance with the manufacturer's recommendations and is ready for operation. The manufacturer's field service technician shall replace damaged or malfunctioning equipment and report to the Engineer any discrepancies or issues with the installation.

B. The manufacturer's representative shall, upon satisfactory completion of inspection and testing, attach a label to all serviced devices indicating the date serviced and testing company responsible.

2.4 FIELD TESTING AND COMMISSIONING

A. Functional testing, commissioning, and first parameter adjusting shall be carried out by a factory-trained manufacturer's field service representative. This manufacturer's field service technician shall provide all material, equipment, labor and technical supervision to perform inspection, testing and adjustments to ensure equipment is installed, adjusted, and tested in accordance with the manufacturer's recommendations and is ready for operation. The manufacturer's field service technician shall replace damaged or malfunctioning equipment and report to the Engineer any discrepancies or issues with the installation.

B. Operational Readiness Testing

1. The Contractor shall inspect and test furnished equipment and associated systems for conformance to the contract documents, including equipment manufacture's recommendations, and readiness for operation. The test shall include the following as a minimum:

    a. Visually inspect for physical damage and proper installation

    b. Perform tests in accordance with manufacturer's instructions

    c. Perform tests to ensure compliance with Contract Documents

    d. Perform tests that equipment is ready for operation

    e. Touch-up paint all chips and scratches with manufacturer-supplied paint and transfer remaining paint to Owner

2. Contractor shall submit an operational readiness test report documenting all test results, including all assumptions, conditions, allowances and corrections made during the test. The report shall provide a listing of all modifications and

adjustments made onsite to include any settings / parameters not identified as factory defaults within the equipment's O&M documentation. The test report shall include a signed statement from the Contractor, installer(s) and the factory-trained manufacturer's representative(s) certifying that the furnished equipment and associated system have been installed, configured, and tested in accordance with the manufacturer's recommendations, completely conforms to the requirements of the Contract Documents and is ready for operation.

C. Functional Demonstration Testing

1. Prior to scheduling functional demonstration testing the Contractor shall submit a signed statement from the Contractor, installer(s) and the factory-trained manufacturer's representative(s) certifying that the furnished equipment and associated system have been installed, configured, and tested in accordance with the manufacturer's recommendations, completely conforms to the requirements of the Contract Documents and is ready for operation.

2. The Contractor shall completely demonstrate the functionality and performance of the equipment and associated systems in the presence of Owner and Engineer, observing and documenting complete compliance with the Contract Documents.

3. The Contractor shall submit a written report documenting successful completion of functional demonstrating testing including all assumptions, conditions, allowances and corrections made during the test.

2.5 TRAINING

A. O&M Training: Onsite training specific to the equipment furnished shall be provided to the Owner's staff by a factory trained manufacturer's representative. Training duration shall be sufficiently adequate to cover the operation and maintenance of the equipment and shall consist of not less than [1] repeated session(s) with [4] hours of onsite classroom and hands-on instruction for a minimum of [4] attendees per session, or as agreed upon by the Owner in writing.

1. The instructor shall provide sufficient time and detail in each session to cover the following as a minimum:

a. Theory of operation

b. Major components of equipment

c. Operation of equipment

d. Configurations of equipment

e. Maintenance, troubleshooting and repair

f. Replacement of component level parts

2. The submitted O&M manuals shall be used for training.

2.6 SUPPORT

A. The OEM microgrid energy management system should offer long-term support and troubleshooting during the lifetime of the management system.

END OF SECTION

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SECTION 26 41 13

LIGHTNING PROTECTION SYSTEM FOR PERMANENT STANDBY GENERATOR

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope:
   1. Contractor shall provide labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install complete lightning protection system for standby generator.

B. Related Sections:
   1. 26 05 26 Grounding And Bonding for Electrical Systems

1.2 MEASUREMENT AND PAYMENT

A. This item is to be included in lump sum cost for Division 26 Electrical Equipment & Installation.

1.3 REFERENCES

A. NFPA 780 – Standard for the Installation of Lightning Protection Systems (Current Edition)

1.4 SUBMITTALS

A. Product Data: Manufacturer's descriptive and technical literature or catalog cuts.

B. Shop Drawings:
   1. Layout of the lightning protection system, specifically for the building(s) or structures included in the contract drawings.
   2. Installation details of the products to be used in the installation.

C. Manufacturer's Instructions: Installation instructions shall be provided for lightning protection components that require field assembly or fabrication.

D. Qualification data for firms or persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include data on listing or certification by a Nationally Recognized Testing Laboratory (NRTL).

E. Certification, signed by standby generator contractor, that structural adhesive and installation method for air terminals and conductors is approved by manufacturers of the lightning protection components and components of the standby generator and/or generator enclosure.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Installing contractor shall provide building owner with an operation and maintenance manual.

B. Warranty Documentation: The completed installation shall carry a one-year guarantee against defects in material or installation.
   1. Exclusions: Routine preventative maintenance, accidental or intentional damage shall not be included as part of the warranty service.

C. Record Documentation: Installing contractor shall provide building owner a copy of the pre-installation site report, post-installation site report and (3) full-size plots of accurate as-built shop drawings.

1.6 EXTRA STOCK MATERIALS

A. Provide extra stock materials to building owner in a single, durably packed container labeled with “26 41 13 – Lightning Protection for Structures”, installing contractor contact information, date and complete listing of contents.
   1. (3) Air Terminal Assemblies
   2. (3) Secondary sized bonding lugs
   3. (3) Main sized bonding lugs or bonding plates
   4. (5) Cable-to-Cable splice connectors
   5. (25') Main sized conductor
   6. (10) Cable fasteners/holder with related hardware

1.7 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer shall maintain current lightning protection material listings from a Nationally Recognized Testing Laboratory (NRTL).
   2. Installer Qualifications: the system shall be installed by a firm actively engaged in the installation of Underwriters Laboratories Inc. Master Labeled Lightning Protection Systems. The persons performing the work of this section and their supervisor shall be personally experienced in lightning protection systems.

B. The system shall be physically inspected by a Nationally Recognized Testing Laboratory (NRTL), such as LPI-IP, to the current edition of NFPA 780. The certification shall be provided to the Owner at completion of the project.

PART 2 PRODUCTS

2.1 AIR TERMINALS

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding safety tip air terminals or equivalent.

B. Substitution Limitations: Project conditions may dictate the use of an air terminal not shown, installing contractor shall coordinate with lightning protection manufacturer to determine proper materials.

C. Product Options:

1. Length: 10” minimum when installed around the perimeter or along the ridge of a building and 24” minimum when installed in mid-roof areas.
2. Point Type: Gently tapered air terminals shall be used in all areas. Exception, mid-roof mounted air terminals shall be safety tipped to prevent personnel injury.
3. Material Type: Where applicable, copper air terminals shall be used. Exception, copper materials shall not be mounted on aluminum, Galvalume ®, galvanized steel, zinc or directly onto other ferrous metal surfaces. In these instances, aluminum air terminals shall be used.

2.2 AIR TERMINAL BASES

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding air terminal bases or equivalent.

B. Substitution Limitations: Project conditions may dictate the use of an air terminal base not shown. Installing contractor shall coordinate with lightning protection manufacturer to determine proper materials.

2.3 CONDUCTORS

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding conductors or equivalent.

B. Material type: Where applicable, bare copper conductors shall be used. Exception, copper materials shall not be mounted on aluminum, Galvalume ®, galvanized steel, zinc or directly onto other ferrous metal surfaces. In these instances, aluminum conductors shall be used.

2.4 CONDUCTOR FASTENERS

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding conductor fasteners or equivalent.

B. Material type: Where applicable, bare copper fasteners shall be used. Exception, copper materials shall not be mounted on aluminum, Galvalume ®, galvanized steel, zinc or directly onto other ferrous metal surfaces. In these instances, aluminum fasteners shall be used.

2.5 ABOVE GRADE CONNECTORS

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding connectors or equivalent.

B. Material type: Where applicable, bare copper connectors shall be used. Exception, copper materials shall not be mounted on aluminum, Galvalume ®, galvanized steel, zinc or directly onto other ferrous metal surfaces. In these instances, aluminum connectors shall be used.

2.6 BONDING LUGS AND PLATES

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning

and Grounding bonding lugs and plates or equivalent.

B. Material type: Where applicable, bare copper bonding connections shall be used. Exception, copper bonding materials shall not be mounted on aluminum, Galvalume ®, galvanized steel, zinc or directly onto other ferrous metal surfaces. In these instances, aluminum or bi-metallic bonding connections shall be used.

2.7 THRU-ROOFS / THRU-WALLS

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding thru-walls or thru-roofs or equivalent.

2.8 GROUNDING ELECTRODES

A. Basis of Design: Subject to compliance with requirements, provide Harger Lightning and Grounding grounding electrodes or equivalent as specified in section 26 05 26 Grounding and Bonding for Electrical Systems.

B. Substitution Limitations: Soil conditions may dictate the use of a grounding electrode not shown. Installing contractor shall coordinate with lightning protection manufacturer to determine proper materials.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install lightning protection system as indicated on approved shop drawing, according to manufacturer's written instructions.

B. Installation shall comply with all aspects of NFPA 780.

C. Conductors shall be concealed from public view where possible.

3.2 CORROSION PROTECTION

A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture, unless moisture is permanently excluded from the junction of such materials.

B. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors, such as tin.

3.3 FIELD QUALITY CONTROL

A. The system shall be physically inspected by a Nationally Recognized Testing Laboratory (NRTL), such as LPI-IP, to the current edition of NFPA 780. The certification shall be provided to the building owner at the completion of the project.

END OF SECTION

SECTION 26 43 13

SURGE PROTECTION DEVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. The Surge Protection Device (SPD) covered under this section includes all service entrance type SPD suitable for use as Type 1 or Type 2 devices that are applied to the line or load side of the utility feed.

2. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install surge protection devices with size and trip rating as shown or specified.

B. Coordination:

1. Review installation procedures under other Sections and coordinate installation of items to be installed with or before surge protection devices.

C. Related Sections:

1. Section 26 05 05, General Provisions for Electrical Systems.

2. Section 26 05 53, Identification for Electrical Systems.

3. Section 26 13 00, Medium-Voltage Switchgear.

4. Section 26 23 00, Low-Voltage Switchgear.

5. Section 26 24 13, Switchboards.

6. Section 26 24 16, Panelboards.

1.2 MEASUREMENT AND PAYMENT

1. This item is to be included in lump sum cost for Unit Substations.

1.3 REFERENCES

A. Standards referenced in this Section are:

1. UL 1449, 4th Edition – Standard for Surge Protection Devices.

2. UL 1283, 7th Edition – Standard for Electromagnetic Interference Filters.

3. UL 96A, 13th Edition – Standard for Installation Requirements for Lightning

Protection Systems.

4. ANSI/IEEE C62.41 – Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.

5. ANSI/IEEE C62.45 – Guide for Surge Testing for equipment connected to Low-Voltage AC Power Circuits.

6. IEEE C62.62 – Standard Test Specification for Surge Protection Devices for Low-Voltage AC Power Circuits.

7. IEEE 1100 Emerald Book

8. NFPA 70 Article 285, National Electrical Code.

9. NFPA 70E, Electrical Safety in the Workplace

1.4 DEFINITIONS

A. Definitions referenced in this section are:

1. I-nominal: Nominal discharge current.

2. MCOV: Maximum continuous operating voltage.

3. Mode(s), also Modes of Protection: The pair of electrical connections where the VPR applies.

4. MOV: Metal-oxide varistor; an electronic component with a significant non-ohmic current-voltage characteristic.

5. OCPD: Overcurrent protective device.

6. SCCR: Short-circuit current rating.

7. SPD: Surge protective device.

8. VPR: Voltage protection rating.

1.5 SUBMITTALS

A. Action Submittals. Submit the following:

1. Product Data:

a. Surge Protection Devices - Product Data

1) Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

2) Include maximum conductor length for all external SPDs.

3) Include manufacturer's suggested OCPD size and rating.

2. Shop Drawings (NOT USED)

3. Samples (NOT USED)

4. Delegated Design Submittal (NOT USED)

B. Informational Submittals. Submit the following:

1. Certificates (NOT USED)

2. Test and Evaluation Reports

a. Surge Protection Devices – Test and Evaluation Reports

b. Copy of UL Category Code VZCA certification, as a minimum, listing the tested values for VPRs, Inominal ratings, MCOVs, type designations, OCPD requirements, model numbers, system voltages, and modes of protection.

3. Manufacturers' Instructions

a. Surge Protection Devices - Manufacturers' Instructions

1) Submit instructions for each type.

4. Source Quality Control Submittals (NOT USED)

5. Field Quality Control Submittals

a. Surge Protection Devices - Field Quality Control

1) Results of Field Quality Control Reports.

6. Qualifications Statements (NOT USED)

7. Manufacturer Reports (NOT USED)

8. Sustainable Design Submittals (NOT USED)

9. Special Procedure Submittals (NOT USED)

C. Closeout Submittals. Submit the following:

1. Operation and Maintenance Data

a. Surge Protection Devices - Operation and Maintenance Data

1) Submit complete installation, operation and maintenance manuals including test reports, maintenance data and schedules, and description of operation.

2. Record Documentation (NOT USED)

3. Training Material (NOT USED)

4. Warranty Documentation

   a. Surge Protection Devices - Warranty Documentation

      1) Submit manufacturer's warranty per the requirements of this Section.

5. Software (NOT USED)

6. Bonds (NOT USED)

7. Maintenance Contracts (NOT USED)

8. Sustainable Design Closeout Documentation (NOT USED)

D. Maintenance Material Submittals. (NOT USED)

1. Spare Parts (NOT USED)

2. Extra Stock Materials (NOT USED)

3. Tools (NOT USED)

1.6 QUALITY ASSURANCE

A. SPDs shall bear the UL label.

B. National Electrical Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.

C. Testing Agency Qualifications: Independent testing agency shall meet OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907, or shall be full member company in InterNational Electrical Testing Association (NETA).

D. Manufacturer:

1. Manufacturer shall have not less than five years of experience producing substantially similar equipment to that required and, upon request, shall submit documentation of not less than five installations in satisfactory operation for not less than five years in the United States.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by the following or equivalent:

1. External SPDs:

a. ASCO Power Technologies

b. Current Technologies

2. Internal SPDs:

a. Eaton.

b. Siemens

c. Square D.

2.2 GENERAL SPD REQUIREMENTS

A. SPD with Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Comply with UL 1449.

D. MCOV of the SPD shall be the nominal system voltage.

2.3 SERVICE ENTRANCE AND TRANSFER SWITCH SUPPRESSOR

A. SPDs: Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 1449, Type 1.

B. SPDs with the following features and accessories:

1. Integral disconnect switch.

2. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.

3. Indicator light display for power and protection status.

4. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of protection status. Contacts shall reverse on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.

5. Surge counter.

C. Comply with UL 1283.

D. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than [480 kA]. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

E. Protection modes and UL 1449 VPR for grounded wye circuits with [480Y/277 V] three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: [1200 V for 480Y/277 V].

2. Line to Ground: [1200 V for 480Y/277 V].

3. Line to Line: [2000 V for 480Y/277 V].

F. Protection modes and UL 1449 VPR for grounded wye circuits with [208Y/120 V], three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: [700 V for 208Y/120 V].

2. Line to Ground: [V for 208Y/120 V].

3. Line to Line: [1000 V for 208Y/120 V].

G. SCCR: Equal or exceed [100 kA].

H. I-Nominal Rating: 20 kA.

2.4 PANEL SUPPRESSORS

A. SPDs: Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 1449, Type 2.

B. SPDs with the following features and accessories:

1. Integral disconnect switch.

2. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.

3. Indicator light display for power and protection status.

4. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of protection status. Contacts shall reverse on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.

5. Surge counter.

C. Comply with UL 1283.

D. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than (480 kA). The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

E. Protection modes and UL 1449 VPR for grounded wye circuits with [480Y/277 V] three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: [1200 V for 480Y/277 V].

2. Line to Ground: [1200 V for 480Y/277 V].

3. Line to Line: [2000 V for 480Y/277 V].

F. Protection modes and UL 1449 VPR for grounded wye circuits with [208Y/120 V], three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: [700 V for 208Y/120 V].

2. Line to Ground: [1200 V for 208Y/120 V].

3. Line to Line: [1000 V for 208Y/120 V].

G. SCCR: Equal or exceed 100 kA.

H. I-nominal Rating: 20 kA.

2.5 ENCLOSURES

A. Indoor Enclosures: NEMA 250, Type 12.

2.6 CONDUCTORS AND CABLES

A. Power Wiring: Same size as SPD leads complying with Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables.

1. External SPDs:

a. Contractor shall not exceed manufacturer's recommended maximum length of cabling.

b. Contractor shall consult with Engineer for all cable installations longer than manufacturer's recommended maximum length.

B. Class 2 Control Cables: Multi-conductor cable with copper conductors not smaller than No. 18 AWG, complying with Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables.

C. Class 1 Control Cables: Multi-conductor cable with copper conductors not smaller than No. 14 AWG, complying with Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables.

PART 3 EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install an OCPD or disconnect as required to comply with the UL listing of the SPD.

C. Install SPDs with conductors between suppressor and points of attachment as short and straight as possible and adjust circuit-breaker positions to achieve shortest and straightest leads.

1. Do not splice and extend SPD leads unless specifically permitted by manufacturer.

2. Do not exceed manufacturer's recommended lead length.

3. Do not bond neutral and ground.

D. Use crimped connectors and splices only. Wire nuts are unacceptable.

E. Wiring:

1. Power Wiring: Comply with wiring methods in Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables.

2. Controls: Comply with wiring methods in Section 26 05 19, Low-Voltage Electrical Power Conductors and Cables.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative.

1. Compare equipment nameplate data for compliance with Drawings and Specifications.

2. Inspect anchorage, alignment, grounding, and clearances.

3. Verify that electrical wiring installation complies with manufacturer's written installation requirements.

B. An SPD will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.3 STARTUP SERVICE

A. Complete startup checks according to manufacturer's written instructions.

B. Do not perform insulation-resistance tests of the distribution wiring equipment with SPDs installed. Disconnect SPDs before conducting insulation-resistance tests and reconnect them immediately after the testing is over.

C. Energize SPDs after power system has been energized, stabilized, and tested.

3.4 DEMONSTRATION

A. Train Owner's maintenance personnel to operate and maintain SPDs.

END OF SECTION

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SECTION 28 33 00

FUEL GAS DETECTION AND ALARM

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

B. Equipment and all necessary accessories as designated in this section for a multiple-station gas system which shall include the following.

1. Standalone Detectors.

2. Multi-Zone Control Panels.

3. Remote Sensors/Transmitters.

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.

B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.3 STANDARD AND REGULATORY REQUIREMENTS

A. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. Reference to any code, standard or regulation shall mean the latest published editions, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

C. In the event of conflict between codes, standards or regulations, the conflict shall be referred to the Engineer for resolution.

D. The organizations having jurisdiction include, but are not limited to, the following:

1. AGA American Gas Association

2. ANSI American National Standards Institute

3. ASME American Society of Mechanical Engineers

4. FCC Federal Communications Commission

5. NEMA National Electrical Manufacturers Association

6. NFPA National Fire Protection Association.

7. OSHA Regulations of the Occupations Safety and Health Administration.

8. RoHS Restriction of Hazardous Substances Directive

9. UL Underwriter's Laboratories Inc.

10. The state, county or municipal laws and regulations governing the location where the equipment is to be installed.

E. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

A. 'Buy America' Requirements: All manufactured products listed within this specification section are part of a federally assisted procurement involving funds granted by the Federal Transit Administration (FTA) and shall comply with Buy America requirements as delineated by Title 49 Code of Federal Regulations (CFR) Subsection 661.

1.4 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.5 SUBMITTALS

A. Design Data: Include details of materials, construction, and finish. Include relationship with adjacent construction.

B. Manufacturers Installation Instructions: Submit installation instructions for material and equipment.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

D. Shop Drawings - Submit in accordance with Division 1 -General Requirements of these specifications.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings

shall further include

dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.

2. Provide product data for each equipment indicated and include the following:

   a. Manufacturer's data sheets on each product to be used.

   b. Preparation instructions and recommendations.

   c. Storage and handling requirements and recommendations.

   d. Typical installation methods.

   e. Product dimensions including required clearances.

   f. Drawings showing physical dimensions, mounting requirements and terminations.

   g. General arrangement or component drawing.

   h. Panel layout drawing.

   i. Wiring Diagram.

3. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

4. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

E. Startup service reports.

1. Certificate: Contractor's start-up and demonstration affidavit

F. Operation and Maintenance Manual:

1. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

   a. Commissioning instructions.

b. Calibration Instructions/schedule frequency

c. Trouble shooting guide and instructions.

d. Vendor data or “cut sheets” on major components.

e. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

f. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

G. 'Buy America' Certificates: ‘Buy America' certificates required during bidding shall also be required as part of each product submittal. Certificates shall be complete and accurate. Certificates shall indicate either compliance or non-compliance with the ‘Buy America' regulations. Certificates of non-compliance shall also include copies of any granted waivers. Waivers still being applied for or being processed at the time of submittal shall be indicated as such.

1.6 WARRANTY

A. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials.

B. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to the Owner.

C. The warranty period shall be the Manufacturer's standard warranty period, but not less than a minimum of twelve (12) months after startup, or 18 months after delivery of the equipment at the site (whichever comes first).

D. Warranty shall include materials and labor necessary to correct defects.

E. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

F. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.

B. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 COORDINATION

A. Coordinate with electrical and controls contractor all device locations, power and wiring requirements and any special wiring requirements.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. American Gas Safety.

2. Emerson.

3. Honeywell.

4. MSA.

5. Sensidyne.

6. Siemens.

2.2 GENERAL

A. Provide a system with electrically supervised detection and noncoded alarm of combustible gas in Class I, Division 1, Group C and D locations, conforming to the applicable requirements of NFPA 70 and NFPA 72.

2.3 CONTROLLER

A. The Gas Detection Controller shall have the following features:

1. Multi-Channel Gas Controller shall be microprocessor based with 7-inch LCD touchscreen display 800 X 480 resolution and capacitive multi-touch TN panel for easy screen navigation.

2. The controller shall be capable of operating over a temperature range of 32 to 125 degrees F, capable of monitoring multiple detectors.

3. The controller shall be housed in a weatherproof cabinet suitable for wall mounting in a Class I, Division 1, location with solid-state plug-in-type relays and solid-state rectifiers

4. The system uses an RS-485 communication protocol that accommodates 128 channels through four digital ports. In addition,

there are 128 analog inputs from any 4-20 mA device and equally 128 4-20 mA outputs.

5. The system can accommodate up to 128 binary inputs and 128 binary outputs.

6. Communications:

   a. Modbus RS485

   b. BACnet IP

7. The system communicates wirelessly for programming and downloading of data through smartphone or tablet device.

8. Input/output boxes can be installed at any location on the RS-485 network for ease of installation of additional sensors.

9. A touch screen graphic display is used for programming.

10. All relevant gas detection data, such as relay status, historical data, location and addresses of sensors are displayed by scrolling through multiple screens.

11. The controller has a scheduler that can be programmed to activate relays and deactivate relays several times a day based on a frequency of day, weekday or weekend only.

12. An auto-configure program searches for connected devices.

13. The unit can accept any 4-20 mA signal, which is ideal for additional monitoring such as temperature humidity and other parameters that may be of interest.

14. Controllers can be connected together to a centralized system that will display gas detection concentrations of an entire facility. Remote monitors are an optional item that can be used to observe the concentration of gases prior to entering the space.

2.4 SENSORS/TRANSMITTERS

A. Provide the quantity and type of gas detection sensors as shown on the drawings

B. Natural Gas/Methane sensor(s) shall have a catalytic bead sensing element, with a typical life of three (3) years.

   1. Pre-calibrated sensors can be purchased and installed by the user thereby reducing calibration costs and minimizing downtime.

C. Transmitter electronics

   1. Microprocessor based.

2. Housed in a NEMA 4X enclosure

3. The controller shall have an alphanumeric LCD display for gas concentration and unit configuration, five LED's for communication and relay status, and three function keys for operation/configuration.

4. Programming and calibration is nonproprietary and is accessed through a user selectable password that protects system integrity

5. The sensors can be installed as stand-alone, digitally networked with controller through a standard RS-485, Modbus communication port.

6. A user configured 4-20 mA, 2-10 VDC, or 1-5 VDC analog output that is fully assignable over a chosen range is standard.

7. Three user programmable relays

   a. The relays can be configured to energize at a preselected concentration or based on a time-weighted average concentration.

8. 80 dB buzzer.

D. The natural gas sensors shall be powered by a 24VAC class 2 power supply. Class 2 power supply will be provided by the gas monitoring equipment supplier and installed by the electrician or controls contractor.

2.5 ACCESSORIES

A. External Audible Alarm:

1. Basis of Design: Vibratone Horns, Model 350; as manufactured by Federal Signal.

2. Operating Temperature: Minus 65 to 150 degrees F (minus 54 to 66 degrees C).

3. Weight: 1.4 pounds (0.6 kg).

4. Size (WxHxD): 4.06 x 4.06 x 2.19 inches (103 x 103 x 55.6 mm).

5. Model 350-024-30:

   a. Power Requirements: 24 VAC, 0.90 A, 50/60 Hz.

   b. Decibels: 100 at 10 feet (110 at 1 M).

6. Model 350-120-30:

   a. Power Requirements: 120 VAC, 0.18 A, 50/60 Hz.

   b. Decibels: 100 at 10 feet (110 at 1 M).

B. External Strobe:

1. Operating Temperature: Minus 31 to 150 degrees F (minus 35 to 66 degrees C).

2. Weight: 0.1 pounds (0.06 kg).

3. Size (WxHxD): 3.94 x 3.95 x 1.6 inches (100 x 100 x 40.6 mm).

4. Flash Rate: 80 per minute.

5. Candela Peak: 108,000.

6. Mounting: Surface.

7. Model VALS-024:

   a. Power Requirements: 24 VAC, 0.08 A.

8. Model VALS-120:

   a. Power Requirements: 120 VAC, 0.06 A, 50/60 Hz.

C. Fuse:

1. Basis of Design: Radial Lead Fuse, 374 Series, TR5 Fuse, Time Lag; as manufactured by Littelfuse.

2. Compliance: UL 248.

3. Halogen free and lead-free.

4. Reduced PCB space requirements.

5. Low internal resistance.

D. Modbus:

1. Basis of Design: Modbus TRNS Gen 2 as manufactured by Brasch Environmental Technologies, LLC

   a. Communicates across a two-wire RS-485 bus using the Modbus RTU protocol.

   b. Addressable with up to 128 unique addresses

   c. Supports Function Code (FC) 04

   d. Provides gas sensor readings and error codes

   e. Data on This Bus: Readable by a remote device capable of interfacing with this protocol. The remote device is the client and the TRNS is the server.

1) Baud Rate: 9600

2) Data: 8 bits

3) Stop: 1 bit

4) Parity: None

5) Flow Control: None

f. DIP Switch: 7-position. Used to set the device address.

g. Programmed and configured at the factory; field adjustable.

h. Address is assigned using a binary counting system.

2.6 SYSTEM SEQUENCE OF OPERATION

A. Natural gas alarm shall be set at 20% (low) and 50% (high) LEL within the 0 - 100% LEL measuring range.

B. When natural gas concentration from the sensors exceeds the low alarm setpoint, the audible alarms shall sound, the light indicator associated with that alarm will be activated at the Multi-Channel Gas Controller, the alarm will be transmitted to the Remote Alarm Panel and BMS system.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until mounting surfaces have been properly constructed and prepared. If mounting surface preparation is the responsibility of another installer, notify Owner in writing of unsatisfactory preparation before proceeding.

B. Before installation, Contractor shall verify actual locations, and note any conditions affecting installation, routine maintenance, and operation.

1. Final locations indicated on Drawings are approximate. Determine exact locations before roughing-in for electrical connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

B. Equipment Mounting: Mount all sensors at or as close as possible to the recommended heights.

1. Sensor Mounting Heights

a. Natural Gas Sensor HT = 2' – 0” below ceiling.

C. Install in locations that will allow access for calibration and testing.

D. The Contractor shall wire the sensors to their respective channels inside the controller with shielded cables specified by the equipment manufacturer to certify length and maximum loop resistance as required.

E. Ensure that the installation of combustible-gas detection and alarm systems complies with ICC IFGC, NFPA 70 and applicable requirements of NFPA 72.

3.3 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01

3.4 TESTING

A. General: Test system either in its entirety or in sections after system is installed or cleaned.

B. Conduct performance tests in accordance with ANSI/ISA 60079-29-1.

C. Test operation of the entire system in operational and alarm modes. Activate each detector by a gas calibration bottle representing the adjusted Lower Flammable Limit (LFL). Test the malfunction feature for each control unit.

3.5 CLEANING

A. Clean products in accordance with the manufacturer's recommendations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 TRAINING

A. Provide on-site operator training services to be performed by a factory trained field experienced professional.

B. Train Owner's maintenance and operations personnel on how to adjust, operate, and maintain the gas detection system.

END OF SECTION

SECTION 31 20 00

EXCAVATION

PART 1 - GENERAL

1.1 Excavation shall include the removal of existing material to the elevations required for the proposed pavement sections as shown in the plans; removal, disposal or stockpiling of material excavated as required; subgrade preparation; re-use of excavated material; placement and compaction of re-used material or imported engineered fill to the required elevations shown in the plans and in accordance with the Caltrans Standard Specifications, APWA Standard Specifications for Public Works Construction, Current Edition and these Special Provisions.

1.2 SECTION INCLUDES

A. Excavation

B. 1-Sack Cement Slurry Backfill

C. Engineered Fill

D. Buried Man-made Objects

E. Dust Control

F. Surplus Material

G. Hazardous Materials in Excavation

H. De-watering

I. Utility Trenches

1.3 RELATED SECTIONS

A. Not Used

1.4 REFERENCE STANDARDS

A. Caltrans Standard Specifications, Current Edition

1. Section 5.120, “Coordination with Other Entities”

2. Section 14-11, “Hazardous Waste and Contamination”

3. Section 18, “Dust Palliatives”

4. Section 19, “Earthwork”

B. APWA Standard Specifications for Public Works Construction (Greenbook), Current Edition

1.5 REFERENCE DOCUMENTS

A. The reference documents listed below were referenced in the preparation of this specification. The documents are considered supplemental information except as referenced in these Special Provisions. The Contractor may use these documents at their own risk.

1.6 SUBMITTALS

A. Engineered Fill Product Data: Submit source, gradation, R-value, sand equivalent, and durability for the proposed fill material.

B. Engineered Fill Certified Test Results: At least seven calendar days in advance of desired date of ENGINEER'S approval, submit certified test results performed by an independent testing laboratory certifying that the proposed base material complies with the specifications. Test results shall not be more than 30 days old. Test results shall indicate type of aggregate, gradation, R-value, sand equivalent, and durability.

C. Documentation: Submit delivery tickets from each load of fill delivered to the Worksite which include, as a minimum the supplier, material and its composition, and material weight.

D. Health and Safety Plan: Contractor shall prepare a site specific Health And Safety Plan (HASP) that complies with the HAZWOPER requirements for excavation and other work related to excavating, handling or otherwise coming into contact with hazardous materials in excavation (impacted soil). Non-HAZWOPER trained personnel shall not excavate, handle or otherwise come in contact with impacted soil. Contractor shall designate, mark, and enforce an exclusion zone to prevent unauthorized contact with impacted soils. Contractor shall also supply, construct, and maintain a decontamination area for personnel and equipment at the perimeter of the exclusion zone.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Engineered Fill

Onsite excavated material may be used as engineered fill provided it is free of oversized rock, organic materials and deleterious debris. Oversized material is defined as material exceeding 8 inches in diameter. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

B. 1-Sack Cement Slurry Backfill: a self-compacting, cementitious flowable material requiring no vibration or tamping to achieve consolidation, may be used. The Contractor must submit a mix design in writing to the Engineer for approval. The design shall provide:

1. A minimum 28 day strength of 50 psi and a maximum 28 day strength not to exceed 150 psi.
2. Consistency shall be flowable (6 to 8 IN slump)

Onsite excavated material may be used as engineered fill provided it is free of oversized rock, organic materials and deleterious debris. Oversized material is defined as material exceeding 8 inches in diameter. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

C. Unsuitable Material
Onsite excavated material that is soft or yielding is considered unsuitable and may not be used as engineered fill and must be disposed of offsite as surplus material.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Pavement and Trench Areas: The existing asphalt pavement, including base, sections are assumed to be 20” thick, or as shown on the contract drawings. Contractor to verify and match existing pavement section.

B. Upon removal of the existing asphalt pavement areas, contractor shall have MTS contracted geotechnical engineer test soils for constituents of concern prior to excavation. Stockpiles shall not be allowed on-site.

3.2 PLACEMENT OF ENGINEERED FILL

A. Engineered fill shall be placed in uniform, loose lifts of approximately 8 inches and then compacted to prior to the placement of subsequent lifts. Engineered fill shall be moisture conditioned to at least 4 percent above optimum moisture content. Onsite excavated material shall be compacted to a minimum of 90 percent relative compaction based on ASTM D 1557. Material placed in the upper 12 inches of pavement subgrade shall be scarified then moisture conditioned to a moisture content of 3% above optimum content and compacted to a minimum 95 percent relative compaction.

3.3 BURIED MAN-MADE OBJECTS

A. Buried man-made objects discovered during excavation and not previously known or otherwise identified in the plans shall be removed and disposed of according to Section 19-1.03D, “Buried Man-made Objects”, of the Caltrans Standard Specifications and these Special Provisions. The CONTRACTOR shall immediately inform the ENGINEER of the discovery of any buried man-made objects. Depressions left by removed buried man-made objects shall be backfilled with engineered fill.

3.4 DUST CONTROL

A. The Contractor Watering for dust control shall comply with Section 18, “Dust Palliatives”, of the Caltrans Standard Specifications.

3.5 SURPLUS MATERIAL

A. Surplus excavated material not designated or determined to contain hazardous waste shall become the property of the Contractor and shall be disposed of offsite in conformance with Caltrans Standard Specifications, except that MTS shall be absolved from responsibility instead of the Department. Surplus material shall not be disposed of in any MTS or public street right of way.

3.6 HAZARDOUS WASTE IN EXCAVATION

A. There is the possibility that there is undocumented hazardous material onsite. If the Contractor encounters hazardous waste in excavation, as defined by Section 25117 of the Health and Safety Code, the Contractor shall immediately so notify the Engineer in writing. The Engineer shall notify the City of San Diego Solid Waste Local Enforcement Agency (LEA) and MTS during earthwork. Excavation in the immediate area of the suspected hazardous material shall be suspended until the Engineer authorizes it to be resumed. If such suspension delays the current controlling operation, the Contractor will be granted an extension of time as provided in Section 8-1.07, "Liquidated Damages," of the Standard Specifications.

If such suspension delays the current controlling operation more than 2 working days, the delay will be considered a right-of-way delay and the Contractor will be compensated for each such delay as provided in Section 8-1.08, "Right of Way Delays," of the Standard Specifications.

MTS reserves the right to use other forces for exploratory work to identify and determine the extent of such material and for removing hazardous material from such area.

B. Should TPH- and pesticide-impacted soil or other contaminants be encountered during excavation, the Contractor excavation work shall be modified as follows:

1. Comply with requirements outlined in the Soil Management Plan.
2. Comply with San Diego County Department of Environmental Health (SDCDEH) requirements and guidance (e.g., guidance for sampling subsequent to UST and associated piping removal and oil/water separator system removal).
3. Comply with the SDCDEH Site Assessment and Mitigation (SAM) Program Manual, dated September 2, 2010 or any later revision. Specifically refer to Section 5-XI – waste characterization and soil reuse.
4. Comply with California Code of Regulations, Title 22, Division 4.5, “Environmental Health Standards for the Management of Hazardous Waste” regarding identification of hazardous waste.
5. During excavation, segregate impacted from non-impacted soil. This may be done on a bucket-by-bucket load basis. Contractor shall also take various monitoring instrument readings and samples. Contractor will evaluate which bucket load or scraped run is impacted or not impacted based on visual observations, odor, and photoionization detector (PID) readings, except for those areas predetermined as pesticide impacted.
6. Should potentially impacted soil be discovered, the Resident Engineer shall be contacted immediately.
7. Place impacted and non-impacted soil in separate stockpiles on-site. In some cases a third soil stockpile may be needed for “questionable” soils.
8. Maintain soil stockpiles as required. Contractor shall collect soil samples for environmental analytical testing and waste characterization.
9. Cover all stockpiles daily with Visqueen or similar plastic sheeting with a minimum thickness of 10-millimeters. The sheeting will be anchored with sand bags to minimize rain or water used for dust control from contacting the waste and collecting in the stockpile areas. The temporary stockpiles shall be constructed to a maximum height of 7 feet with flat tops to facilitate sampling, if necessary. All stockpiles shall be kept covered when not actively being worked on. When the stockpiles are actively worked on, light misting will be used to minimize generation

of dust. Load stockpiles for disposal as requested by the ENGINEER.

C. Contractor shall hire an environmental consultant to be onsite during all soil management activities. The environmental consultant's onsite personnel shall be trained and have at least 3 years of experience in the use and calibration of appropriate instrumentation used in the testing and classification of soil that is potentially impacted by TPH and pesticides. All testing results and reports shall be delivered to the Engineer as soon as they are available.

D. Contractor shall have the Soil stockpiles remain in-place until soil sampling and waste characterization has been completed to allow for proper disposal. It is anticipated that excavated impacted soil will need to be stockpiled for a period not to exceed 30 days. Stockpiling of excavated soil at the Site shall be coordinated with the Engineer. Should the potentially non-impacted stockpile be found to be free of contamination, the soil shall be re-used or disposed of offsite, as required by the Contractor.

E. Regulatory Requirements for Permitting for Dust and Emissions Controls: Contractor shall comply with the requirements outlined in the construction drawings for dust control as well as erosion control. Regarding the impacted soil stockpile shall be continuously covered with plastic sheeting. Plastic sheeting shall consist of Visqueen or similar plastic sheeting (minimum 10-mil thickness). Sand bags, staking or other means shall be applied to maintain plastic sheeting cover from possible winds. Impacted soil stockpiles shall also be placed on plastic sheeting.

F. Regulatory Requirements For Construction Contractor and Personnel: Excavation and handling of impacted soils shall be performed by an appropriately licensed California construction contractor with Hazardous Substance Removal Certification (California Code of Regulations [CCR], Division 9, Title 16, Article 3. Classification). In addition, all personnel working on sites exposed to hazardous substances, health hazards, or safety hazards and their supervisors shall be trained and covered under the Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements (Code of Federal Regulations [CFR] Standard 29 Part 1910.120) including current 8-hour HAZWOPER refresher training. Contractor shall comply with all elements of the HAZWOPER requirements including:

1. Training;
2. Training Refreshers;
3. Medical Surveillance; and
4. Safety and Health Program Implementation.

G. Regulatory Requirements For Soil Profiling, Transportation And Disposal:

1. Soil Profiling: Prior to removal from Site, the impacted soil and other potential hazardous or regulated waste must be profiled. Sample and analytical test data from Site investigations may be used for profiling; preferably data for the impacted oil stockpile should be used. The hired environmental consultant shall assist with waste profiling; however, the waste generator is responsible for profiling the waste and determining the following:

   a. Hazardous waste determination
   b. The proper documentation (e.g. hazardous waste manifest or bill-of-lading)
   c. The proper disposal (or treatment) facility.

d. Waste manifest or bill-of-lading shall be signed by the waste generator, transporter, and disposal facility.

2. Soil Transportation: Hazardous waste shall only be transported by a Department of Transportation (DOT) licensed hazardous waste hauler. Hazardous waste and petroleum-impacted (nonhazardous) waste shall utilize shipping documents acceptable to the receiving facility and in compliance with state and federal requirements. Each load must be accompanied by a signed hazardous waste manifest or bill-of-lading. Each load must be completely covered with a secured tarp.
3. Upon exiting the Contractor's exclusion zone at the Site, all soil shall be removed from the exterior of the truck and truck tires by means such as, but not limited to, brushing/sweeping to prevent spreading of impacted soil beyond the construction excavation exclusion zone and on to streets.
4. Soil disposal: Impacted soil shall be transported only to the generator's approved disposal facilities soil profiles shall be approved prior to shipment. Trucks shall be released only under the following conditions:

   a. Loads leaving the Site are logged by the Contractor (i.e. truck number/name, date and time);
   b. Facility is approved in advance by the waste generator;
   c. Each load transported to facility is accompanied by a hazardous waste manifest or bill-of-lading;
   d. Each load is weighed and tared; and
   e. Each load is documented by the Contractor.

5. Contractor's documentation shall include the following:

   a. Copies of all disposal facility-signed hazardous waste manifests or bill-of- lading;
   b. Log of each load;
   c. Log of each load's weight and tare weight; and
   d. Certificate from disposal facility documenting acceptance/treatment for total quantity of impacted soil and other wastes disposed.

6. Impacted soil shall be disposed at a facility authorized to receive contaminate soil.

H. Dust Control and Air Monitoring Compliance. The Contractor shall take action to prevent, reduce, or mitigate contaminated dust emissions through use of best management practices (BMPs). Dust suppression shall be performed by the Contractor, as required, by spraying with a light mist of water. Watering for dust suppression shall comply with Section 17, “Watering”, of the Caltrans Standard Specifications. It should be noted that there are no specific air monitoring requirements in San Diego County for sites where TPH- or pesticide-impacted soil is the main constituent of concern. For soil that is to be temporarily stockpiled, the Contractor shall contain and cover the soil using 10-mil Visqueen or similar plastic sheeting for dust suppression purposes.

I. Water Pollution Control Plan (WPCP). The Contractor shall follow the WPCP for all on-site and disposal activities. See also MTS Stormwater Standards and Section 5.26 Temporary Stormwater Pollution Control.

J. Contractor must secure and maintain graded/excavated areas in the event of a storm.

BMPs shall be used to prevent soil (impacted or otherwise) from washing into storm drains, being tracked, or washing off Site. BMPs should also protect open excavations to the extent practical, to prevent flooding and the subsequent need for over- excavation.

K. For soil that is to be temporarily stockpiled, the Contractor shall contain and cover the soil using 10-mil Visqueen or similar plastic sheeting, to the extent necessary to prevent soil transport by storm water from the stockpile. The Contractor shall use erosion control bags around the stockpile perimeters if rain is forecast or if rain occurs.

L. Spills of Soil or Other Materials. Contractor shall maintain appropriate required BMPs to prevent and mitigate potential spills of potentially hazardous materials. If a spill of potentially hazardous material occur, the Contractor shall take all appropriate steps required to clean up the spill in a timely manner. Contractor will also immediately notify the RWQCB (as required), local Fire Department, and MTS of the spill. Contact Information follows:

a. MTS
Mr. Eli Belknap
Manager of Capital Projects
100 16th St.
San Diego, CA 92101
Tel: (619) 595-7039
Eli.Belknap@sdmts.com

b. Fire-Rescue Department– San Diego
Emergency: 911
Non-Emergency: (619) 533-4300
sdfd@sandiego.gov

M. Tracking and Reporting of Impacted Soil.

1. Photographs of Construction Excavations: Contractor shall photograph obvious features within the construction area that are associated with contamination and with the construction activities. Photographs shall be taken, as necessary, to assist in documenting pre-existing environmental conditions encountered during construction grading and excavation.
2. Photographs shall be numbered and a brief description compiled for each photograph, including location (i.e. location number), orientation (i.e. facing east, on the west end of the excavation area), date, and description of feature. In addition, general photographs of Site activities shall also be taken to document construction progress and environmental procedures.
3. Field documentation Organization: Contractor shall compile field documentation related to environmental conditions. Field reporting shall be performed by completing standard forms that will be compiled as the job progresses. This documentation shall be organized into several files as follows:
   a. Map(s) of the Site showing the location and dimensions of each excavation;
   b. Estimated quantities of soil temporarily stockpiled on-Site;
   c. Estimated quantities of soil removed from Site and transported to a disposal facility (based on field notes);
   d. Actual quantities of soil removed from the Site and transported to a disposal facility (based on weight tickets);
   e. Photographs organized by Site area that document relevant features, such

as apparent preferential pathways or observed indications of contamination;

f. Copies of bills of lading and manifests for soil removed and transported to an off-Site treatment or disposal facility; and

g. Miscellaneous correspondence.

3.7 UTILITY TRENCH EXCAVATIONS

A. Trenches and excavations shall be designed and constructed in accordance with OSHA and other applicable government safety codes and regulations. Excavations deeper than 5 feet shall be shored or laid back on a slope no steeper than 1.5:1 (H:V). For trench excavations, Contractor shall meet OSHA requirements regarding personnel safety with the appropriate use of shoring or laying back of slopes. If seepage is encountered, the Contractor shall immediately inform the Engineer. The Engineer or his designee shall evaluate the seepage and determine if de-watering is required. Contractor shall keep vibrations away from the immediate excavation area. The Contractor shall setback all stockpiled materials from the trench a distance of at least one half the excavation depth. Shoring and/or bracing may be required. The material excavated from the trench may not be re-used as backfill and must be treated and disposed of as contaminated waste pending sampling and testing in accordance with Article 3.5. of these Special Provisions.

B. The project site contains existing utilities that are shallow. Contractor shall pothole and inform the Engineer of the location of all existing utilities at crossings prior to excavation. The Contractor shall determine alternative duct bank configurations at each crossing where conflicts exist and obtain approval from Engineer prior to excavation.

C. Not all utilities are shown on the project plan sheets. It is the responsibility of the contractor to provide utility locating to ensure no additional utilities are on the project.

3.8 DE-WATERING

A. De-watering is not anticipated on this project. If groundwater or water drainage from excavated soils is encountered during construction, the Contractor shall immediately inform the Engineer, sample and control the runoff in a manner that is consistent with the Water Pollution Control Plan (WPCP). De-watering shall be considered Force Account Work if required and shall conform Section 9-1.04, “Force Account”, of the Caltrans Standard Specifications.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Excavation shall be measured by the cubic yard based on the dimensions of material in place, as shown within the construction plans and these Special Provisions. Includes excavation of trench and any miscellaneous excavation. It shall NOT include the concrete and asphalt material removed as part of Demolition.

B. Loading, Hauling, and Disposing Clean Fill Export (no manifest) shall be measured by the cubic yard and completed in accordance with the Contract Documents and as measured by the Engineer, removed from the site and delivered to a location approved by the Owner. Does not include excavation of the material.

C. Loading, Hauling, and Disposing Non-Hazardous waste (manifest required) will be

measured by the cubic yard and completed in accordance with the Contract Documents and as measured by the Engineer or Owner's representative. The quantities as contained on the Bid Form, Schedule of Quantities and Prices, or approved schedule of values, as applicable, as derived from the Plans will be used as the basis for this measurement. Does not include excavation of the material.

4.2 PAYMENT

A. Excavation shall be paid by the cubic yard based on the dimensions within the construction plans. Full compensation for Excavation shall include furnishing the labor and materials, equipment, tools and incidentals involved in excavation, subgrade preparation, placement of engineered fill, stockpiling and re-use of suitable excavated material and disposal of surplus material. Includes excavation of trench and any miscellaneous excavation. Pavement removed as part of Demolition shall NOT be included in the payment made for Excavation.

B. Loading, Hauling, and Disposing Clean Fill Export (no manifest) furnished and completed in accordance with the Contract Documents will be paid for at the Contract Price, as listed on the Bid Form or Schedule of Quantities and Prices, as applicable. This price shall include full compensation for furnishing all labor, materials, tools, equipment, supplies, supervision, and incidentals, and doing all work for loading, hauling and disposing of clean material, as shown on the Plans, and as specified in these Special Provisions, and as directed by the Engineer. Does not include excavation of the material.

C. Full compensation for workers to attend OSHA accepted HAZWOPPER 40 Hour Training and possess a certificate showing proof of acceptable training as described in this section shall be included in various items of work involved and no additional compensation will be allowed therefor.

END OF SECTION

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SECTION 31 23 33

GAS LINE TRENCHING, BACKFILL, AND RESURFACING

PART 1 - GENERAL

1.1 SCOPE

A. This specification covers requirements for excavation, backfill, base (bedding), shading material and resurfacing for trenches intended for buried gas utilities.

1.2 SECTION INCLUDES

A. Excavation

B. Buried Man-Made Objects

C. Dust Control

D. Surplus Material

E. Hazardous Waste in Excavation

F. Utility Trench Excavation

G. De-watering

H. Resurfacing

1.3 RELATED SECTIONS

A. 31 20 00 EXCAVATION

1.4 REFERENCE STANDARDS

A. Caltrans Standard Specifications, Current Edition

B. APWA Standard Specifications for Public Works Construction (Greenbook), Current Edition

C. SDG&E Service Standards & Guide, Current Edition

D. SDG&E Underground Construction Standards, Current Edition

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's information, material source, gradation, R-value, sand equivalent, and durability for the shading and base (bedding) material.

B. It is the responsibility of the contractor to provide material whose constituents meet all applicable requirements of this specification. The Supplier must be capable of supplying a consistent material. Subsequent to Supplier approval, the Supplier shall make no changes to the material without satisfying the following conditions:

- Prior written notice to the engineer and SDG&E of intent to change material.
- Written notification from the engineer and SDG&E approving the change.

1.6 DEFINITIONS

A. Sand: Natural, manufactured, or recycled granular material, or a combination thereof, free of deleterious amounts of contaminants defined in this specification.

B. Manufactured Sand: Material made by crushing existing native natural material.

C. Recycled Sand: Material made by crushing concrete, asphalt-concrete, or concrete and asphalt mixture.

D. Supplier: Manufacturer, vendor, contractor, or developer who supplies trench bedding, shading, and material for use in installing gas utilities.

E. Base (bedding): A layer of select materials, normally screened sand, placed at trench bottom for the purpose of providing uniform support of the buried utility and protection from substructures, trench irregularities, rock projections or other features that could cause damage to the utility.

F. Shading: A layer of select material, normally screened sand, to surround the utility after installation for the purpose of protecting it from damage by the backfill material.

G. ASTM: American Society for Testing and Materials

1.7 SDG&E COORDINATION

A. Contractor shall coordinate gas meter install and point of connection for 2” gas service line prior to construction of gas service trench.

B. Contractor shall coordinate inspection of gas service trench prior to SDG&E installing gas service and energizing the system.

C. Contractor shall coordinate gas meter install, trench inspection, gas service installation by calling the number listed on the following SDG&E service order.

D. After SDG&E has installed gas service and energized the system, the contractor is responsible for backfilling and resurfacing the trench.

SDGE

GAS METER & SERVICE LOCATION

Customer Copy

Notification #: 300000540950	Job #: 530000331752	TB: 1330-E5
Wanted Date: ON INSPECTION	Date Prepared: 09/06/2023	
Customer Type: Commercial	Service Type: LARGE GAS METER & SERVICE RELOCATION	
Project Title: MTS SB MTNANCE FAC- GAS SVC GEN		
Project Address: 3650 MAIN ST	Project City: CHULA VISTA	
Additional Address Info:		
Customer POC: Michael McEachern	Customer Phone #: 619-595-7031	
SDGE Contact: Operations Assistant	Contact Info: , 619-699-1039	
☐ Traffic Control Permit Required	☒ SDG&E Application Required-Call: 1-800-411-7343	
Excavation/Encroachment Permits Required By: Customer		
Municipal Inspection required By: CITY OF CHULA VISTA		

SERVICE INSTALLATION AND/OR METER LOCATION:
Replace existing 1" PE service at 3650 MAIN ST (GS 105330-03) with new 2" PE service. No EFV required since load exceeds EFV capacity, install 2" PE curb valve in accessible location. Install new 2" riser w/bypass. Replace existing 7M MSA with new 16M-HP MSA @5psig delivery pressure. Riser to houseline spacing to be 90". Customer houseline to be inspected, tested and released by city inspection to SDGE prior to setting MSA. Customer is responsible for installing step-down regulation on appliances when required.

Barrier Posts Required?		
Trench By: Customer	Joint Trench With:	
☐ Tier Header Required	Date Header Wanted:	
Number of Meters on:	# 00	Regulator: DUAL

Meters are required to be readily accessible 24 hours per day. Meters must be located in a safe area free of any potentially hazardous or dangerous condition. Provide 3-ft. x 3-ft. clear and level working space in front of meter. Meter must be located on premises to be served. PHONE DIG ALERT "811" AT LEAST TWO DAYS PRIOR TO TRENCHING FOR LOCATION OF UNDERGROUND UTILITIES.

Additional Information: ☐ Right of Way Required Assessor's parcel Number:
Please call your Operations Assistant at 619-699-1039 with questions about application, inspection, construction installation and to schedule a crew.

If SDG&E encounters hazardous or toxic material while performing construction of your project, SDG&E will halt work immediately and it will be your responsibility to remove and or clean up all hazardous or toxic material prior to SDG&E continuing construction. SDG&E shall have no liability or obligation whatsoever to cleanup, remove or remediate any hazardous or toxic materials discovered during the course of construction unless it is through negligence of SDG&E.
Customer-owned facilities to receive gas service are subject to all applicable local and state of California inspection authority requirements. Building address and/or houseline must be permanently identified prior to meter set. Barrier posts may be required based on field conditions at any time prior to meter set as determined by the SDG&E Representative. Per Rule 16.A.1.a. In compliance with Section 783 of the Public Utilities Code, SDG&E will apply only those construction and design specifications, standards, terms, and conditions that are applicable to a new extension of service project for the 18 months following the date the application for a new extension of service project is approved. Keep this notice with your building permit.
All installations performed under this order must meet SDG&E standards unless a written deviation has been approved.

Planned By: James Sarmiento	Phone#: 6196767435

PART 2 - Sand: Natural, manufactured PRODUCTS

2.1 MATERIALS

A. Base (bedding) and shading material intended for buried gas utilities consist of natural sand, equivalent native natural material, manufactured sand, or recycled sand, or a

combination thereof and shall meet SDG&E Underground Standard specifications UG3370 and UG3371 and the requirements of this specification.

B. Base (bedding) and shading material shall be free of hazardous material. Oblong rocks (cobbles) or angular pieces of rock that resemble arrowheads, as described in ASTM D2488, shall not be included in the base or shading material. Beach sand shall not be used under any circumstance.

C. The manufactured sand, recycled sand, or a combination thereof, submitted for testing shall meet the specifications provided in Table 1.

Table 1 – Sand Requirements

Property	Test Method	Requirements
Sand Equivalent	California Test 217 or ASTM D2419	≥ 20
Durability Index	California Test 229	≥ 35
pH Value	California Test 643	Case-by-case evaluation by the Company, with a minimum value of 6.0
Electrical Resistivity (ohm- cm)	California Test 643	Case-by-case evaluation by the Company, with a minimum value of 4,500 ohm-cm
Organic Impurities	ASTM C40	Shall not be darker than the Plate #3 when compared to standard Gardner Color Series
Sieve Size	ASTM C136 Size (inch)	Total percentage of material passing by weight (%)
	½ (0.500)	100
	#4 (0.187)	91 - 100
	#8 (0.0937)	72 - 100
	#16 (0.0469)	50 -100
	#30 (0.0232)	30 - 90
	#50 (0.0117)	12 - 46
	#100 (0.0059)	1 - 26
	#200 (0.0029)	0 - 16
Compaction Test	ASTM D1557	Relative compaction of 95% or greater

PART 3 - EXECUTION

3.1 EXCAVATION

A. The contractor shall obtain all permits and traffic control approvals prior to construction within the public right of way at K Street. The trench location shown on the plans is approximate and shall be coordinate by the contractor with SDG&E from the gas meter station to the point of connection. All base material, shading and backfill must be approved by the Engineer and SDG&E prior to placement and acceptance of material. The contractor shall obtain all traffic control approvals and permits required to complete the work prior to the start of construction. State law requires the contractor to contact DigAlert at least 2 working days prior to excavation.

3.2 BURIED MAN-MADE OBJECTS

A. Buried man-made objects discovered during excavation and not previously known or otherwise identified in the plans shall be removed and disposed of according to Section 19-1.03D, “Buried Man-made Objects”, of the Caltrans Standard Specifications and these Special Provisions. The CONTRACTOR shall immediately inform the ENGINEER of the discovery of any buried man-made objects. Depressions left by removed buried man-made objects shall be backfilled with engineered fill.

3.3 DUST CONTROL

A. The Contractor Watering for dust control shall comply with Section 18, “Dust Palliatives”, of the Caltrans Standard Specifications.

3.4 SURPLUS MATERIAL

A. Surplus excavated material not designated or determined to contain hazardous waste shall become the property of the Contractor and shall be disposed of offsite in conformance with Caltrans Standard Specifications, except that MTS shall be absolved from responsibility instead of the Department. Surplus material shall not be disposed of in any MTS or public right of way.

3.5 HAZARDOUS WASTE IN EXCAVATION

A. There is the possibility that there is undocumented hazardous material. If the Contractor encounters hazardous waste in excavation, as defined by Section 25117 of the Health and Safety Code, the Contractor shall immediately so notify the Engineer in writing. The Engineer shall notify the City of San Diego Solid Waste Local Enforcement Agency (LEA) and MTS during earthwork. Excavation in the immediate area of the suspected hazardous material shall be suspended until the Engineer authorizes it to be resumed. If such suspension delays the current controlling operation, the Contractor will be granted an extension of time as provided in Section 8-1.07, "Liquidated Damages,” of the Standard Specifications.

3.6 UTILITY TRENCH EXCAVATIONS

A. Trenches and excavations shall be designed and constructed in accordance with OSHA and other applicable government safety codes and regulations. Excavations deeper than 5 feet shall be shored or laid back on a slope no steeper than 1.5:1 (H:V). For trench excavations, Contractor shall meet OSHA requirements regarding personnel safety with the appropriate use of shoring or laying back of slopes. If seepage is encountered, the Contractor shall immediately inform the Engineer. The Engineer or his designee shall evaluate the seepage and determine if de-watering is required. Contractor shall keep vibrations away from the immediate excavation area. The

Contractor shall setback all stockpiled materials from the trench a distance of at least one half the excavation depth. Shoring and/or bracing may be required.

3.7 DE-WATERING

A. De-watering is not anticipated on this project. If groundwater or water drainage from excavated soils is encountered during construction, the Contractor shall immediately inform the Engineer, sample, and control the runoff in a manner that is consistent with the Water Pollution Control Plan (WPCP). De-watering shall be considered Force Account Work if required and shall conform Section 9-1.04, “Force Account”, of the Caltrans Standard Specifications.

3.8 RESURFACING

A. Gas line trenching and resurfacing through K Street is within the public right of way and is subject to City of San Diego requirements and standard drawings. SDG&E shall approve the trench, tie-in excavation, base shading and backfill material prior to installing the gas service and energizing the system. The SDG&E inspector must approve installation of shading material prior to backfill and resurfacing the trench. The contractor shall replace all sidewalk, curb and gutter, asphalt, and striping to restore the existing condition as shown in the plans and to the satisfaction of the City representative.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Gas Line Trenching, Backfill, and Resurfacing shall be measured by the linear foot of trench construction, as shown within the construction plans and these Special Provisions. Gas Line Trenching, Backfill, and Resurfacing shall include all pavement and concrete removal, saw cutting, backfill, base/bedding, shading material, and resurfacing of the trench. SDG&E shall inspect/approve the trench and install the gas service line and energize the system prior to backfill and resurfacing.

4.2 PAYMENT

A. Gas Line Trenching, Backfill, and Resurfacing shall be paid by the linear foot based on the dimensions within the construction plans. Final alignment and exact point of connection to be coordinate with SDG&E prior to the start of construction. Full compensation for Gas Line Trenching, Backfill, and Resurfacing shall include furnishing the labor and materials, equipment, tools and incidentals involved in demolition, excavation, subgrade preparation, placement of backfill, stockpiling and re-use of suitable excavated material, disposal of surplus material, traffic control, encroachment permits, and resurfacing of the trench.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Aggregate Base Material

B. Installation Standards

C. Spreading of Material

D. Compacting

E. Field Quality Control

1.2 RELATED SECTIONS

Not Used

1.3 REFERENCE STANDARDS

A. Caltrans Standard Specifications, Current Edition

1. Section 26, "Aggregate Bases"

1.4 SUBMITTALS

A. Product Data: Submit source, gradation, R-value, sand equivalent, and durability for the proposed material.

B. Certified Test Results: At least seven calendar days in advance of desired date of ENGINEER'S approval, submit certified test results performed by an independent testing laboratory certifying that the proposed base material complies with the specifications. Test results shall not be more than 30 days old. Test results shall indicate type of aggregate, gradation, R-value, sand equivalent, and durability.

C. Documentation: Submit delivery tickets from each load delivered to the Worksite which include, as a minimum the supplier, material and its composition, and material weight.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE MATERIAL

A. Aggregate base shall be in Class 2, 3/4 in accordance with Section 26, Aggregate Bases, Caltrans Standard Specifications.

2.2 SOURCE QUALITY CONTROL

A. Once the material has been approved, change source of supply only after obtaining approval of the new source material.

B. Approval of a source of supply does not relieve the Contractor from the obligation to furnish material which conforms to the specified requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect in accordance with the Contractor's Quality Management Plan and document in writing acceptance of the prepared subgrade before proceeding with the placement of aggregate course.

B. The subgrade to receive aggregate course, immediately prior to spreading, shall conform to the compaction and elevation tolerances indicated for the material involved and shall be free of standing water and loose or extraneous material.

3.2 INSTALLATION STANDARDS

A. Aggregate base course shall be spread over the prepared subgrade in accordance with Section 26 of the Caltrans Standard Specifications.

B. Aggregate base course shall be compacted to a minimum of 95 percent relative compaction as obtained by the ASTM D 1557 test procedure.

C. Aggregate course shall have minimum uniform thickness after compaction of dimensions indicated on the Plans. Where not indicated, compacted thickness shall be 6 inches. Grade tolerances shall be in accordance with Section 26 of the Caltrans Standard Specifications.

3.3 FIELD QUALITY CONTROL

A. Field testing shall be performed in accordance with the test methods specified in Caltrans Standard Specifications Section 26. Tests shall be performed by Contractor -hired independent testing laboratory.

B. Perform sampling and tests of the aggregate base materials for grading, sand equivalent, resistance (R-value) and durability to determine compliance with specified requirements. Samples shall be taken from material as delivered to the site. Tests shall represent no more than 500 cubic yards of base course material or one day's production, whichever is the lesser amount.

C. Perform field tests to determine compliance with requirements for compaction and moisture content of aggregate bases. Testing frequency shall be not less than one test for every 2,000 square feet of aggregate base material, per layer or lift.

D. Measure thickness of the aggregate bases. Perform a minimum of one test for each unit of 2000 square yards of aggregate bases installed at a location selected by the ENGINEER. For units of aggregate bases less than 2000 square yards, perform a minimum of one test. In that unit where the aggregate subbase or base is deficient by more than 0.05 foot in thickness, the deficiency shall be corrected to meet the required grade and thickness using a method approved by the ENGINEER.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Aggregate Base to be measured by the cubic yard in accordance with the Standard Specifications and these Special Provisions. The quantity is determined from the dimensions shown in the Construction Plans and Details.

4.2 PAYMENT

A. Aggregate Base to be paid by the cubic yard in accordance with the Standard Specifications and these Special Provisions.

END OF SECTION

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SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Asphalt Materials

B. Aggregate materials.

C. Asphalt paving base course and wearing course.

D. Asphalt paving overlay for existing paving.

E. Field quality control.

1.2 REFERENCE STANDARDS

A. Caltrans Standard Specifications, Current Edition

1. Section 39, “Asphalt Concrete”

B. City of San Diego Greenbook Supplement (Whitebook), Current Edition

1.3 SUBMITTALS

A. Product Data:

1. Submit product information for asphalt and aggregate materials.

2. Submit mix design with laboratory test results supporting design.

B. Certified Test Results: At least seven calendar days in advance of desired date of ENGINEER'S approval, the CONTRACTOR shall submit certified test results performed by an independent testing laboratory certifying that each batch of the proposed asphalt binder material complies with the specifications. Test results shall not be more than 12 months old.

PART 2 - PRODUCTS

2.1 TRENCH RESURFACING

A. Trench resurfacing for asphalt paving areas shall be per COSD Std Dwg SDG-107.

2.2 ASPHALT PAVING

A. Asphalt Concrete paving shall be assumed to be 7 inches in depth, unless otherwise shown on the plans, with horizontal dimensions as shown on Contract Plans.

2.3 SOURCE QUALITY CONTROL

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the City of San Diego for asphalt paving work.

PART 3 - EXECUTION

3.1 EQUIPMENT

A. Spreading and Compacting Equipment

1. Spreading and compacting equipment shall conform to Section 39-2.01C(2), "Spreading and Compacting Equipment" of the Caltrans Standard Specifications.

3.2 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Asphalt Concrete will be measured by the ton of asphalt actually placed and verified by the ENGINEER by the certified weight tickets. Recorded batch weights or truck scale weights will be used to determine the basis for the tonnage.

4.2 PAYMENT

A. The contract unit price paid per ton of Asphalt Concrete actually placed and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in installing Asphalt Concrete complete in place, including testing, job mix formula preparation and approval process, tack coat, and asphalt cold joint adhesive (as required) as shown on the construction drawings and as specified in these Special Provisions.

END OF SECTION

SECTION 32 31 13

BOLLARDS AND BOLLARD COVERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Steel pipe bollards for equipment and structure protection.

B. Bollard covers: Polyethylene protective pipe sleeves for steel pipe bollards.

1.2 RELATED SECTIONS

A. Not used.

1.3 REFERENCE STANDARDS

A. Not used.

1.4 SUBMITTALS

A. Product Data: Submit to the Engineer per Section 3.9, "Submittals" under General Conditions, the manufacturer's or supplier's certification that the materials delivered to the site are in compliance with the Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fixed Bollard shall be 6" diameter standard galvanized pipe and concrete filled per Civil Details of the plans. Bollard shall include shop coating as specified on the contract drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fixed Bollards are to be set in holes which shall have been formed or drilled as shown on the plans or as directed by the Engineer. After the bollards have been set in place and properly supported to hold them in line and grade, the remaining space shall be filled with concrete as specified in the project plans.

3.2 TOUCH-UP AND FIELD PAINTING

A. Touch-up damaged coatings following installation.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Fixed Bollards shall be measured by each bollard installed.

4.2 PAYMENT

A. The contract price for Fixed Bollard shall include the full compensation for furnishing all labor, materials, tools, equipment, and incidentals, for acquiring and installing the bollards complete in place, and touch-up painting, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

END OF SECTION

SECTION 44 13 73

CATALYTIC REDUCTION EQUIPMENT

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 WORK INCLUDED

A. The installation of the catalytic reduction system shall include the following:

1. Horizontal catalyst/oxidation reactor vessel, including catalyst.

2. Mixer assembly with injection tubes.

3. Urea storage tank, with valving and instrumentation.

4. Metering/Injection system complete with metering pump, dosing box, and atomizing air compressor.

5. Engine exhaust gas continuous sampling system.

6. Flexible connections, as required.

7. Urea injection control and instrumentation system.

8. PLC controls with indicators, alarms, and shutdown annunciators.

9. All necessary trim, pipe, valves instruments and fittings within the boundaries of equipment furnished by Suppliers (interconnecting tubing is by others).

10. Bolts, nuts, and gaskets at system flanged interfaces.

11. Electrical wiring, conduit and all electrical components within the boundaries of manufacturer's scope of supply.

12. Prime and finish painting of equipment, components and structure, auxiliary equipment and piping, and other exposed steel surfaces.

13. Shop testing.

14. Startup and two-year operational spare parts.

15. Special tools required for erection, operation, or maintenance.

16. Foundations, structural steel, anchor bolts, washers, and nuts.

17. Insulation and painting.

18. On-site technical support and supervision during installation and start-up.

19. Operator Training.

B. The SCR system shall be installed outdoors in the exhaust duct of one (1), natural gas fueled, engine/generator set (refer to specification 263213). The SCR system shall reduce the exhaust emissions to the level as listed in Attachment No. 2. The scope of equipment supplied shall be as specified herein, and in the Equipment Data Sheets on which the operating conditions and special requirements are listed.

C. In the event the Engine exhaust temperature exceeds 975 deg F (including all exhaust temperature tolerances) thus causing ammonia slip above CA limits at any load point, an additional oxidizing catalyst or a pre-cooler shall be provided to cool the exhaust prior to the SCR catalyst and to limit the ammonia slip to the level acceptable by EPA. The SCR catalyst shall be able to handle the elevated flue gas temperatures during the engine low load operations.

1.2 QUALITY ASSURANCE

A. The Supplier shall be responsible for satisfactory total operation of the SCR and its certification. This supplier shall have had experience with three (3) or more installations of SCRs of comparable size and complexity in regards to coordinating, engineering, testing and supervising. Each of these installations shall have been in successful operation for three (3) or more years. Prior to review of submittals, the Engineer reserves the right to:

1. Have the Supplier submit a list of locations of similar installations.

2. Inspect any of these installations and operations of the SCR system, and question the user concerning the installations without the presence of the Supplier.

B. Factory authorized representative shall be capable of providing emergency maintenance and repairs at the project site within four (4) hours maximum of notification.

C. Supplier shall be responsible for coordination of all sub-suppliers, and for overall guarantees relating to the mechanical and electrical compatibility of equipment, including the proper functioning of instrumentation, control and the interaction of the overall system.

D. Manufacturer's quality plan shall be available for review and shall specify how Manufacturer shall ensure that:

1. All engineering, design, drafting, calculations, specifications, and other related work performed by Supplier, his sub-suppliers, or his subcontractors is ensured of being accurate, technically correct, and in compliance with all specifications, codes, standards, and other technical requirements of the specification.

2. All applicable Standards and Engineering specifications, documents, and other requirements are communicated to and complied with by sub-suppliers and subcontractors.

3. All materials can be verified as to origin and conformance to requirements.

4. Fabrication is in accordance with approved drawings and procedures. Non- conforming work is subject to corrective action or replacement.

5. Non-conforming items are not shipped without Owner's authorization.

6. Verification equipment is correctly calibrated and adjusted.

E. Experience: Equipment shall be produced by a manufacturer of established reputation with a minimum of five years experience supplying specified equipment.

F. Manufacturer's Representative:

1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out and start up.

2. Training: Provide technical representative to train Owner's maintenance personnel in operation and maintenance of specified equipment.

1.3 STANDARD AND REGULATORY REQUIREMENTS

A. All materials, design, fabrication, assembly and test procedures shall be in accordance with the requirements of all applicable codes, standards or regulations having jurisdiction over the work.

B. Reference to any code, standard or regulation shall mean the latest published editions, including addenda, supplements and revisions thereto, which are in effect when the purchase order is awarded.

C. In the event of conflict between codes, standards or regulations, the conflict shall be referred to the Engineer for resolution.

D. The organizations having jurisdiction include, but are not limited to, the following:

1. ANSI American National Standards Institute

2. ASME American Society of Mechanical Engineers

3. EPA Federal, State and Local Environmental Protection Agencies

4. IBC International Building Code, California Edition

5. ISA Instrument Society of America.

6. NEC National Electrical Code.

7. NEMA National Electric Manufacturer's Association.

8. NFPA National Fire Protection Association.

9. OSHA Regulations of the Occupations Safety and Health Administration.

10. UL Underwriter's Laboratories Inc.

11. The state, county or municipal laws and regulations governing the location where the equipment is to be installed.

E. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic and fire codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

1.4 SUBMITTALS

A. Refer to Drawing Q9.06 Shop Equipment Schedule for submittal requirements listed in the “Submittals” column of the equipment list. In the event of conflict between Drawing Q9.06 Shop Equipment Schedule and the following expanded submittal descriptions, Drawing Q9.06 Shop Equipment Schedule is to govern.

B. Product Data:

1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.

2. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review. Non- marked or generic product data submittals with no marks indicating specific items, parts and accessories will be a cause for rejection.

3. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

C. Operation and Maintenance Manual:

1. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

a. Description of system and components.

b. Schematic diagrams of electrical, plumbing and compressed

air systems.

c. Manufacturer's printed operating instructions.

d. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.

e. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

2. Assemble and provide copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.

D. Shop Drawings: Submit in accordance with Division 1 -General Requirements of these specifications. Refer to Drawing Q9.06 Shop Equipment Schedule for the equipment mark numbers requiring shop drawings.

1. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.

1.5 SPARE PARTS

A. With his proposal, the Supplier shall identify all spare parts, including source, cost and identification of the manufacturer and associated model number, critical to initial startup that are recommended for the Engineer/Owner to have on-hand to minimize unplanned construction delays or equipment downtime, as well as a standard priced spare parts list for replacement of components as needed. The Supplier shall recommend spare parts expected for replacement during startup and two (2) years of operation.

1.6 PRODUCT SUBSTITUTIONS

A. Follow requirements specified in Division 1 - General Requirements.

B. Additional costs resulting from substitution of products other than those specified, including drawing changes and construction, will be at the expense of the Contractor.

C. Substitution Approval: Manufacturers listed for each equipment item may bid without submittal for that item. Manufacturers not listed shall submit for approval in accordance with "Instructions to Bidders". Prior to installation, submittals for

each equipment item by Mark Number shall be provided in accordance with Division 1 - General Requirements.

1.7 WARRANTY

A. The Manufacturer shall warrant that all materials and equipment furnished under this contract will be new and of good quality, free from defects in design, workmanship, and materials.

B. Each item of equipment, or part thereof, proving to be defective within the specified period of the warranty shall be replaced, free of defect, without cost to the Owner.

C. The warranty period shall be the Manufacturer's standard warranty period, but not less than a minimum of twelve (12) months after startup, or 18 months after delivery of the equipment at the site (whichever comes first).

D. Warranty shall include materials and labor necessary to correct defects.

E. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish.

F. Submit warranties in accordance with Division 1 - General Requirements of these specifications.

G. All parts shall be readily available locally in the United States.

1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid, dusty conditions.

B. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Mark Number of this specification.

C. Provide equipment and materials specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.9 LABELING

A. Manufacturer shall securely attach in a prominent location on each major item of equipment a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (U.L.), or other National Recognized Testing Laboratory (NRTL), in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to compliance with requirements of this specification, are as follows:

1. Safety Power Inc.
2. Miratech Corp.
3. Steuler
4. Johnson Matthey

2.2 GENERAL

A. Asbestos or asbestos filled materials shall not be used for any component.

B. The SCR system shall be guaranteed to achieve reduction of emissions to levels below the maximum site emissions from a minor stationary source located in a Severe Non-Attainment area as defined by Title V of the Federal Clean Air Act of 1990, as well as the emissions reduction criteria stipulated by the San Diego Air Permit and Control District.

C. Urea is the only reducing agent that will be accepted for use in the SCR system.

D. Supplier shall ensure the total back pressure imparted on the engine exhaust by the SCR System, and other in-line exhaust components shall be less than the engine manufacturer recommends

2.3 SELECTIVE CATALYTIC REDUCTION SYSTEM

A. SCR Reactor Vessel

1. The SCR catalyst reactor housing shall be fabricated from non-scaling heat resistant stainless steel, of rigid reinforced construction. The SCR catalyst reactor housing shall be equipped with ANSI flanges at both ends. The SCR housing and all components in contact with engine exhaust shall be suitable for continuous operation at the maximum engine exhaust temperature without scaling, deformation or any other physical damage for the life of the system.
2. The SCR reactor housing shall be equipped with insulation supports. Insulation shall be supplied and installed by others.
3. The SCR reactor housing shall be designed to be mounted horizontally in the engine exhaust gas duct and be supported from overhead. The SCR supporting steel shall be provided by Supplier.
4. The reactor housing shall be equipped with sample gas ports, maintenance and inspection doors for easy access and catalyst bed loading and unloading, instrumentation connections and other connections as deemed necessary by the Supplier.

5. The SCR vessel catalyst core shall consist of an adequate number of layers of catalyst material, with room for one (1) additional layer of material in the reactor housing. Each layer of catalyst material shall be of a modular design. Catalyst modules shall be of size and weight to facilitate manual loading.

6. The catalyst shall be type as recommended by the SCR manufacturer and shall be designed for operation at the maximum and minimum exhaust temperatures achievable by the engine.

B. Catalyst

1. General

a. Shall be extruded, ceramic blocks with square monolithic channels (honeycomb type). The catalyst material shall be mixed into the substrate prior to extrusion. The catalyst material composition shall be tungsten, vanadium, titanium and other base metals. The catalyst shall have a proven track record in similar applications.

b. Shall operate and perform properly without the use of a guard bed or filter which may become masked, coated and clogged and require frequent cleaning and/or change-out due to compounds and particulates such as soot or ash.

c. Shall be shop assembled with a high temperature fiberglass gasket material. The modules should be approximately 6 inches x 6 inches in cross section and 6, 12 or 18 inches in depth for ease of field installation and removal from the reactor housing.

d. Shall be designed to minimize the SO2 to SO3 conversion rate.

e. Shall be of sufficient mass such that the natural frequency in or around the engine is far above the resonant frequency of the engine firing so it will not resonate.

2. SCR Catalyst

a. Shall have a minimum active surface area of 270 sq ft/cu ft.

b. Shall have an operating range of 572°F to 986°F

3. Ammonia Reduction Catalyst

a. Shall have a minimum active surface area of 270 sq ft/cu ft

b. Shall have an operating range of 572°F to 986°F

c. Shall reduce the concentration of residual ammonia in the exhaust gas without creation of NOx

4. Oxidation Catalyst

   a. Shall have an operating range of 572°F to 986°F

   b. May be located within the SCR Converter Housing or in a separate housing upstream of the injection lance.

C. Catalytic System Accessories

1. The SCR system shall include a static exhaust gas mixer to be mounted upstream of the SCR catalyst reactor housing. The mixer shall insure full and complete mixing of the atomized injected reducing agent with the engine exhaust gas under all engine load conditions. The static mixer shall be fabricated from non-scaling heat resistant stainless steel. The static mixer shall be equipped with a stainless steel injection lance, through which the atomized reducing agent is introduced into the exhaust stream. The static mixer shall be equipped with ANSI flanges at both ends.

2. The static mixer shall be equipped with insulation supports. Insulation shall be supplied and installed by others.

3. The SCR system shall be supplied with a reducing agent storage, injection and control system which shall included but not necessarily limited to the follow: Urea storage tank, metering/injection pump, dosing box, atomizing air compressor, and all appurtenances required to form a complete and operable system. The capacity shall by as recommended by the SCR supplier.

4. Injection Lance

   a. The reducing agent injection lance constructed of 304 Stainless Steel shall be installed on the engine exhaust upstream from the reactor housing at a location to achieve proper reducing agent distribution and atomization. Injection nozzles shall be oriented with respect to engine exhaust gas flow for optimum dispersion of the reducing agent into the engine exhaust gas upstream of the catalyst bed.

   b. The injection lance shall be of the two-phase type using compressed air to atomize the reducing agent.

   c. The injection lance assembly shall be designed for ease of installation and service. The catalyst manufacturer shall supply mating flange for saddle connection of the lance to the exhaust duct

5. Compressed air system, for urea atomization shall be provided by the Supplier.

6. The reducing agent metering and control system shall be capable of insuring, that the maximum ammonia slip to atmosphere from the SCR system does not exceed the limits specified in Attachment No. 2 under

all engine operation conditions. Use of an oxidation catalyst mounted downstream of the SCR catalyst to eliminate excess ammonia slip to atmosphere is prohibited.

7. The Urea/water solution shall be directed into the exhaust gas stream by means of a metered injection nozzle system.

8. The Supplier shall provide one (1) 360 gallon, polyethylene storage tank for urea/water solution. The tank supplied shall be installed indoors within the generator enclosure and be of vertical design. The Urea tank should be manufactured from High Density Cross linked Polyethylene or steel. It should be one piece seamless molded designed with wall thicknesses conforming to ASTMD-1998 standards for liquid storage. Accessories included with the tank:

   a. Level Indication

   b. High/Low Level Alarms

   c. Fill system with vacuum break

D. Piping/Tubing

1. All Urea solution and compressed air pipe/tube materials and components shall be stainless steel. Minimum tube size shall be 1/2 inch nominal. Minimum tubing thickness is 0.063 of an inch.

2. Stainless steel tubing sizes shall be limited to 1" and below. Carbon steel, cast, ductile, or malleable iron piping material shall not be used

3. All stainless steel Urea piping shall be welded. Threaded connections shall be minimized. Pipe threads shall conform to ANSI B2.1, Taper Pipe Threads. Taper threaded connections are unacceptable in stainless steel.

2.4 INSTRUMENTATION AND CONTROLS

A. PLC based, closed loop analysis and reactant injection system to maximize reactant injection efficiency by continuously sampling and analyzing the treated exhaust gas.

B. The SCR control system shall be equipped with an interface display and with a serial interface to permit communication and monitoring of the SCR system from the Building Automation System (BAC). The Supplier shall provide and configure the Modbus communications interface, provide programming of all parameters required to effectively monitor the SCR system from the BAC.

C. Completely pre-wired Control panel, built in accordance to manufacturer standards, with UL listed components, shall be provided.

D. The Temperature and Urea flow information shall be continuously stored in an electronic data storage for the EPA compliance record.

E. General

1. All Control system components shall be designed to operate on 208VAC, Single Phase, 60Hz power with a maximum current draw of 10 Amps per engine set.

2. The control system shall be Programmable Logic Controller based and provide automatic SCR system start-up, operation, shutdown, monitoring and annunciation of abnormal conditions.

3. All tubing within the system shall be either Type 316 stainless steel tubing or heavy wall Teflon. Tubing shall be laid out to minimize elbows and bends, and to present neat, orderly assembly.

4. Wiring within the panel shall be arranged in wire tray to not interfere with routine servicing. All wiring shall be numbered at both ends. Analog signal wiring shall be routed away from power wiring to avoid potential interference. All wiring to and from the metering panel shall terminate on easily accessible, numbered terminal blocks. All components shall be identified with a device tag corresponding to the wiring diagrams and P&ID supplied with the equipment.

5. The control system shall control and provide automatic SCR system start- up, operation, shutdown, monitoring and annunciation of abnormal conditions.

6. The metering panel shall control the amount of reducing agent injected into the exhaust gas stream. The panel shall contain the reducing agent metering equipment and their controls. Controls shall include a main disconnect breaker for power supply; indication of operating status; a PLC to perform all interlock, sequencing, alarm, and injection rate control functions; 24 Volt DC power supply.

7. The reducing agent to be used in the SCR system shall be technical grade urea dissolved in demineralized water to provide a 32 to 40 percent aqueous solution or 19% aqueous ammonia solution.

F. Closed Loop Control Unit

1. Reactant injection rate shall be based on NO emission values and may not be solely dependent on engine speed or power output feed back.

2. Analysis of the NO concentration shall be via a redundant integrated electrochemical cell based sample system. Interfacing with 3rd party analysis systems shall not be allowed

3. Measuring system accuracy and zero must be confirmed on 5 minute intervals by the control system without the use of external calibration/span gas.

4. Data shall be available to the operator via an LCD display. The following data shall be included:

a. Emission Value

b. Emission Target

c. Reactant Injection Rate

d. Operational Alarms with ID Number and Description

5. The system shall automatically stop and re-start under the following conditions:

a. Catalyst bed temperature less than 572 °F

b. Engine shutdown

6. Data Logging capabilities. The Controller should be able to data log every 5 minutes and store up to 3 months of data for troubleshooting purposes the following items.

a. Date

b. Time

c. Engine Load (%)

d. Dosing Valve Opening

e. NO after SCR (ppm)

f. NO emissions (ppm)

g. Reactant flow (l/hr)

h. Temperature after converter (C)

i. Temperature in Converter (C)

j. Pressure drop across converter (mbar)

7. Networking: The controller platform will utilize TCP / IP networking and can accommodate up to 16 control panels and 2 pump controllers on the same network. This network will allow visualization of the network from any controller. Remote access to network via internet for visualization or troubleshooting should be available via dedicated IP address.

2.5 FINISHES

A. All carbon steel surface and equipment shall be primed and finished painted in accordance with manufacturer's standards. In the absences of specific manufacturer's standards, prime paint with a Zinc rich primer (dry film thickness - 2.0 mils min, 2.5 mils max), finish coat shall be of Aliphatic Polyurethane (dry film thickness - 2.0 mils min, 2.5 mils max) or standard manufacturer epoxy paint.

B. Stainless steel components shall not be painted.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas, equipment bases, and conditions, with installing Contractor present, for compliance with requirements for installation and other conditions affecting SCR installation and performance.

B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before SCR system installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. The installation shall be performed in accordance with shop drawings, specifications, and the manufacturer's instructions, and with recognized industry practices, to ensure proper performance in accordance with the specifications.

B. Provide enclosure manufacturer's site personnel to supervise reassembly of the enclosure as well as provide engine manufacturer's certified technicians to perform reassembly of the generator set on site to maintain integrity of the product and warranty.

C. Coordinate with the work of other trades including piping, breeching, electrical power and accessories as necessary to provide a complete operational system.

D. Include the installation of control and monitoring and power panels and other appurtenances to the extent that such appurtenances are not factory installed and wired.

E. Include field inter wiring and power supply and control connections for air compressor, air dryer, urea pumps, switches, solenoid valves and other miscellaneous items as required in accordance with manufacturers wiring diagrams. Such wiring shall include (but not be limited to):

1. Wiring between urea control panel and power supplies thereto.

2. Power supply wiring and control wiring for engine jacket water heater.

3. Power supply wiring and control wiring for fuel pumps, integral fuel tank, float switches, valves and other urea supply system components.

F. Ground equipment.

3.3 FIELD QUALITY CONTROL

A. The complete installation shall be checked for procedural and operational

compliance by a representative of the system manufacturer's authorized local dealer. The engine lubricating oil and antifreeze, as recommended by the system manufacturer, shall be provided by the generator set dealer. If different manufacturers furnish switchgear and generator sets, technical representatives of both manufacturers' authorized dealers shall verify the installation meets requirements. Any deficiencies shall be noted and corrected by the Contractor.

B. The system manufacturer's dealer representative shall be present to assist the Contractor during start-up, systems check, adjusting, and any site testing required after the installation is complete.

3.4 POST-INSTALLATION TESTING

A. The bidder shall furnish all consumables necessary for testing. Any defects, which become evident during the test shall be corrected by the bidder at his own expense prior to shipment to the jobsite.

1. Furnish one full tank of urea.

B. After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with all specified features in the presence of the Engineer using acceptance procedures provided by the manufacturer.

C. Following installation, the following tests shall be performed by the system manufacturer's local dealer representative(s) in the presence of the owner's engineer or designated appointee:

D. Operation

1. Load - Four hours operation at 100% of full load rating. After the first fifteen minute stabilization period at full load, the following shall be recorded at fifteen-minute intervals:

a. Voltage and amperage (3 phase), frequency

b. Fuel pressure, oil pressure and water temperature

c. Exhaust gas temperature at engine exhaust outlet

d. Ambient temperature

2. Proper operation of controls, engine shutdown, and safety devices shall be demonstrated.

3.5 CLEANUP

A. Touch-up damage to painted finishes.

B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

C. Clean area around equipment installation and remove packing or installation debris from job site.

D. Notify Engineer for acceptance inspection.

3.6 TRAINING

A. The Supplier shall provide on-site training for operating and maintenance personnel. This service shall include operating instructions and training for Owner's personnel. Instructions shall include, but not be limited to, training materials,
hands-on and classroom instruction and complete review of all manuals. Classroom training shall be performed in a maximum of 8-hour daily sessions. The hands-on instructions shall include start-up, operation (normal and expected transients), shutdown and maintenance of all systems.

3.7 SERVICE MANUALS AND PARTS BOOKS

A. The system manufacturer's authorized local dealer shall furnish one copy each of the manuals and books listed below for each unit under this contract:

B. Operating Instructions - with description and illustration of all SCR controls and indicators.

C. Parts Books - which illustrate and list all assemblies, subassemblies and components, except standard fastening hardware (nuts, bolts, washers, etc.).

D. Preventative Maintenance Instructions - on the complete system that cover daily, weekly, monthly, biannual, and annual maintenance requirements and include a complete lubrication chart.

E. Troubleshooting Chart - covering the complete SCR system showing description of trouble, probable cause, and suggested remedy.

F. Recommended Spare Parts List - showing all consumables anticipated to be required during routine maintenance and test.

G. Wiring Diagrams and Schematics - showing function of all electrical components.

H. All manuals and books described above shall be contained in rigid plastic pouches.

3.8 SPECIAL TOOLS

A. The Supplier shall furnish one (1) set of special tools required for the SCR system proposed.

PART 4 – ATTACHMENTS

4.1 Data Sheets for SCR System, Emissions Data and Electrical Requirements

ATTACHMENT NO. 1 - SCR SYSTEM DATA SHEET

Service: Selective Catalytic Reduction system (SCR) for one (1) 1000 (+/-5%) kW engine generator set. The SCR system shall reduce the exhaust gas emissions to the level as listed in Attachment No. 2.

Scope: Supplier shall supply, as a minimum, SCR system components as follows:

(1) SCR Reactor housing for horizontal gas flow (with support steel and insulation supports) loaded with SCR catalyst material

(1) Static Mixer

(1) 360 gallon Urea Storage Tank with level transmitter and tank trim

(1) Urea injection system, pumps, dosing box, atomizing air compressor

(1) Electrical equipment and control system

Note: Supplier to furnish information marked with * with the BID

Operating Data	**Specified Information**	**Information by**
Natural Gas Engine Manufacturer	By Supplier	*
Natural Gas Fuel Consumption	By Engine Supplier	*
Load, [%] HP/ kW	By Engine Supplier	*
Exhaust flow rate, wet basis	By Engine Supplier	*
Exhaust flow rate, dry basis	By Engine Supplier	*
Engine exhaust gas temperature	By Engine Supplier °F	*
Consumption of Urea	By SCR Supplier	*
Consumption of water	By SCR Supplier	*
Pressure drop across SCR	By SCR Supplier	*
Pressure drop across Static Mixer	By SCR Supplier	*
Guarantee for SCR catalyst	By SCR Supplier (operating hours)	*

SCR SYSTEM DATA:

Description	**Specified Information**	**Information by**
Urea Consumption – 32.5%	N/A	*
SCR Pressure Loss, inches WC	N/A	*

SCR REACTOR DIMENSIONS:

Description	**Specified Information**	**Information by**
Length / Width / Height	N/A	*
Cross section approx.	N/A	*
Reactor material	Stainless Steel	*

Weight without catalyst material	N/A	*
Weight of Catalyst material	N/A	*
Inlet/outlet flange Type/Size	ASME B16.5	*

SCR-CATALYST MODULE

Description	Specified Information	Information by
Make / Model / Manufacturer	By SCR Supplier	*
Catalyst Module	(*) layers Catalysts + (1) spare	*
Catalyst type /material	By SCR Supplier	*
Catalyst module dimensions	Incl. stainless steel wire mesh	*
Length / Width / Height	By SCR Supplier	*
Catalyst module quantities	By SCR Supplier	*
Arrangement	By SCR Supplier	*
Total catalyst surface	By SCR Supplier	*
Guarantee life of catalyst	By SCR Supplier (operating hours)	*
Min / Max Catalyst Bed Temp	By SCR Supplier	*
Min / Max Temp at Urea Injection	By SCR Supplier	*
Min/Max exhaust gas Temp. at SCR	By SCR Supplier	*
Min / Max press drop across	By SCR Supplier	*
Ammonia Slip (ppmvd)	< 8 ppmvd	*

CO-CATALYST MODULE

Description	Specified Information	Information by
Make / Model / Manufacturer	By SCR Supplier	*
Catalyst Module	(*) layer(s)	*
Catalyst type /material	By SCR Supplier	*
Catalyst module dimensions	Incl. stainless steel wire mesh	*
Length / Width / Height	By SCR Supplier	*
Catalyst module quantities	By SCR Supplier	*
Arrangement	By SCR Supplier	*
Total catalyst surface	By SCR Supplier	*
Guarantee life of catalyst	By SCR Supplier (operating hours)	*
Min / Max Catalyst Bed Temp	By SCR Supplier	*
Min / Max Temp at Urea Injection	By SCR Supplier	*
Min / Max press drop across	By SCR Supplier	*

SCR STATIC MIXER DIMENSIONS

Description	Specified Information	Information by
Length / Width / Height	N/A	*
Cross section approx.	N/A	*
Material	Stainless Steel	*
Weight	N/A	*
Inlet/outlet flange Type/Size	ANSI/ASME B16.5	*

UREA SUPPLY, METERING and INJECTION SYSTEM:

Metering pump w/speed controlled drive (Capacity to be confirmed by Supplier)

Injection lance nozzle with high temperature protection, to be mounted into the static mixer

Injection lance material including set of stainless steel fittings.

80 microns (Supplier to confirm) filter to precipitate suspended particulate from Urea solution with SS screen. Air Compressor with accessories for atomization of urea solution.

ELECTRICAL and CONTROL SYSTEM

Automatic urea metering and control system shall be equipped with closed loop gas analysis system that shall inject urea in accordance with engine load.

SCR Supplier shall furnish temperature sensors for field installation by Contractor, to measure the operating temperature across the SCR catalyst and to release the urea injection upon the catalyst temperature exceeds the required minimum operating temperature for the exothermal reaction of the NOx oxidation. The temperature sensors shall de-energize the injection system upon the Engine shut down. Completely pre-wired UL listed Control panel, built in accordance to manufacturer standards, shall be provided.

UREA STORAGE TANK:

Manufacturer: * Model Number: * Type: Vertical

Capacity: 360 gal (Nominal) Dimensions: * Material: Polyethylene or Steel

Manhole: *” Dia. Flanged w/cover Mounting : *
Tank wall thickness: * Level Transmitter (LT) Required: (X) Yes ( ) No

Tank Connections (sizes and type to be confirmed by Supplier):

Fill (w/internal dip tube if located on top): *” NPT *

System Return (w/internal dip tube if located on top): *” NPT *

Level Transmitter: *“ NPT *

Drain: *" NPT Overflow: *" NPT Pump Suction:*" NPT Vent: *" NPT

Spare connection on the top of the Tank: *" NPT (w/blind flange)

UREA METERING PUMP:

Manufacturer: * Model Number: * Type: *

Horsepower: * Flowrate Required: * gpm Pressure Required: * Pump Speed: * Spm

Pump Material: * housing / * internals / * Non wetted parts

All necessary piping/tubing and associated hardware between urea tank and urea injection nozzle shall be provided including, but not limited to, the following:

Pump air mufflers, strainers/filters, check valves and ball type shut-off valves.

Valve Material: 304 SS or 316 SS * Pipe/Tube Material: 304 SS or 316 SS

UREA ATOMIZING AIR COMPRESSOR:

Manufacturer: * Model Number: * Type: *
Horsepower: * Flowrate Required: * scfm Pressure
Speed: * rpm Materials of construction:

ATTACHMENT NO. 2 - EMISSION DATA

EMISSION DATA	
EMISSION REQUIREMENTS (see note)	**PERFORMANCE DATA**
Nitrogen Oxides (Nox) Grams/BHP-hr Lbs/Mw-hr Ppmvd @ 15% O2 Percent Reduction	 * * 65 *
Carbon Monoxide (CO) Grams/BHP-hr Ppmvd @ 15% O2 Percent Reduction	 * 270 *

VOC Grams/BHP-hr Ppmvd @ 15% O2	 * 60
Ammonia Slip Ppmvd @15% O2	 10
NOTE: Supplier shall confirm emission performance data is in accordance with latest Federal, State and Local Codes for natural gas fueled internal combustion reciprocating engines. All testing requirements shall conform to the regulations set by the County of San Diego Air Pollution Control District.	

END OF SECTION

Contractor's Name: G.A. ABELL, INC. dba PRECISION ELECTRIC COMPANY

Bid Form

PWB437.0-25 SBMF ZEB Backup Power Project

No.	Item Description	Quantity	Unit	Unit Cost	Cost
GENERAL REQUIREMENTS					
1	Mobilization	1	LS	$ 300,000.00	$ 300,000.00
2	Construction Staking and Surveying	1	LS	$ 18,000.00	$ 18,000.00
3	Temporary Storm Water Pollution Control	1	LS	$ 21,000.00	$ 21,000.00
EXISTING CONDITIONS					
4	Sawcut Existing Pavement	360	LF	$ 39.00	$ 14,040.00
5	Remove Existing Asphalt	1225	SF	$ 18.00	$ 22,050.00
CONCRETE					
6	Cast-in-Place Concrete (Minor Concrete)	51	CY	$ 1,960.00	$ 99,960.00
EARTHWORK					
7	Excavation	10	CY	$ 5,700.00	$ 57,000.00
8	Loading, Hauling, and Disposing Clean Fill Export (No Manifest)	10	CY	$ 730.00	$ 7,300.00
9	Potholing	1	LS	$ 9,100.00	$ 9,100.00
EXTERIOR IMPROVEMENTS					
10	Class 2 Aggregate Base	16	CY	$ 550.00	$ 8,800.00
11	Asphalt Concrete	17	TON	$ 4,647.00	$ 78,999.00
12	Fixed Bollard	20	EA	$ 1,350.00	$ 27,000.00
13	Gas Line Trenching, Backfill, and Resurfacing	80	LF	$ 998.00	$ 79,840.00
PERMANENT GENERATOR					
14	Permanent Electric Generator - includes vertical duct mounted load bank, Custom Weather/Sound Enclosure, steel access platform for SCR	1	LS	$ 1,070,000.00	$ 1,070,000.00
15	Microgrid Controller - Installed in Substation B	1	EA	$ 320,000.00	$ 320,000.00
16	Power Cable from Substation A to SWBD A	50	LF	$ 360.00	$ 18,000.00
17	Power Ductbank from Substation A to SWBD A	50	LF	$ 480.00	$ 24,000.00
18	Power Cable from SWBD A to Electric Generator	25	LF	$ 3,360.00	$ 84,000.00
19	Power Ductbank from SWBD A to Electric Generator	25	LF	$ 560.00	$ 14,000.00
20	Control Cable from Microgrid Controller to Generator Control Panel	375	LF	$ 53.00	$ 19,875.00
21	Control Cable from Microgrid Controller to Substation A Breaker	300	LF	$ 56.00	$ 16,800.00
22	Control Cable from Microgrid Controller to SWBD A - Generator Breaker	350	LF	$ 37.00	$ 12,950.00
23	Control Cable from Microgrid Controller to Substation B Breakers	200	LF	$ 65.00	$ 13,000.00
24	Substation A additional components (MV Sections x 3 + Transformer) per vendor quote	1	EA	$ 1,125,000.00	$ 1,125,000.00
25	LV Swichboard - 480V, 3000A, 3Ph 4W, Nema 3R - SWBD A	1	EA	$ 940,000.00	$ 940,000.00
26	SCR System	1	EA	$ 220,000.00	$ 220,000.00
27	Grounding/Bonding of Generator System Assembly	1	EA	$ 40,000.00	$ 40,000.00
28	Lightning Protection	1	LS	$ 15,000.00	$ 15,000.00
29	Installation and Commissioning	1	LS	$ 40,000.00	$ 40,000.00
BATTERY STORAGE					
30	Battery Storage (20' x 8' Containerized, IP54) - 500 kW, 1000 kWh (includes transformer and switchgear)	1	LS	$ 1,007,000.00	$ 1,007,000.00

Contractor's Name: G.A. ABELL, INC. dba PRECISION ELECTRIC COMPANY

Bid Form

PWB437.0-25 SBMF ZEB Backup Power Project

No.	Item Description	Quantity	Unit	Unit Cost	Cost
31	SWBD A Additional Circuit Breakers	1	EA	$ 17,000.00	$ 17,000.00
32	Power Cable, from SWBD A to Battery Storage	20	LF	$ 540.00	$ 10,800.00
33	Power Ductbank, from SWBD A to Battery Storage	20	LF	$ 1,600.00	$ 32,000.00
34	Control Cable from Microgrid Controller to Battery Storage	375	LF	$ 30.00	$ 11,250.00
35	Control Cable from Microgrid Controller to SWBD A - BESS Breaker	350	LF	$ 30.00	$ 10,500.00
36	Installation and Commissioning	1	LS	$ 25,000.00	$ 25,000.00
PHOTOVOLTAIC SYSTEM					
37	PV Panels (Hanwha 425W)	504	EA	$ 900.00	$ 453,600.00
38	DC Optimizer (SolarEdge P860)	252	EA	$ 580.00	$ 146,160.00
39	PV Wiring	1	LS	$ 48,000.00	$ 48,000.00
40	PV Grounding	1	LS	$ 48,000.00	$ 48,000.00
41	PV Support System (Design, Furnish & Install per Manufacturer)	1	LS	$ 98,000.00	$ 98,000.00
42	PV Inverters (SolarEdge 100kW)	2	EA	$ 24,000.00	$ 48,000.00
43	PV Signage and Commissioning	1	LS	$ 9,000.00	$ 9,000.00
44	Power Cable, from Substation B to PV Inverters	50	LF	$ 620.00	$ 31,000.00
45	Control Cable from Microgrid Controller to PV Inverters	50	LF	$ 460.00	$ 23,000.00

TOTAL BID (BASIS FOR AWARD) $ 6,734,024.00

Metropolitan Transit System

Agenda Item No. 24

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Semiannual Uniform Report of Disadvantaged Business Enterprise (DBE) Awards and Payments (Samantha Leslie)

INFORMATIONAL ONLY

Budget Impact

None.

DISCUSSION:

As a Federal Transit Administration (FTA) grantee, San Diego Metropolitan Transit System (MTS) complies with the federal regulations set forth in 49 CFR Part 26 regarding participation by DBEs in the U.S. Department of Transportation (DOT) Program.

I. Goals of MTS's DBE Program

The goals of MTS's race-neutral DBE program are:

1. to ensure nondiscrimination in the award and administration of DOT-assisted contracts;
2. to create a level playing field on which DBEs can compete fairly for DOT-assisted contracts;
3. to ensure that the DBE program is narrowly tailored in accordance with applicable law;
4. to ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are permitted to participate as DBEs;
5. to help remove barriers to the participation of DBEs in DOT-assisted contracts;
6. to assist the development of firms that can compete successfully in the marketplace outside of the DBE program; and
7. to provide appropriate flexibility to recipients of federal financial assistance in establishing and providing opportunities for DBEs.

II. MTS's DBE Triennial Overall Goal for FFY 2025-2027

The DBE regulations require MTS to prepare a DBE Triennial Overall Goal. The DBE Triennial Overall Goal is established upon the number of ready, willing, and able DBE contractors within MTS's geographic market area that are available to bid on MTS's federally assisted

procurements (excludes transit vehicle procurements per FTA DBE Regulations). On July 18, 2024 (Agenda Item (AI) 5), the MTS Board of Directors approved an aspirational DBE Overall Goal of **5.6%** on federally funded contracts for FFY 2025-2027 (October 1, 2024, to September 30, 2027)**.**

III. Participation by certified DBEs

For purposes of reporting DBE participation to the FTA, MTS may only count participation by certified DBE contractors. In order to be certified as a DBE through the California Unified Certification Program, contractors must:

(1) have a majority owner who is **socially and economically disadvantaged** (Native Americans, Black Americans, Hispanic Americans, Asian-Pacific Americans, Subcontinent Asian Americans, Women and any additional groups whose members are designated as socially and economically disadvantaged by the U.S. Small Business Administration (SBA)) are currently presumed to be socially and economically disadvantaged by the DOT);

(2) the majority owner must have a personal net worth of less than **$2,047,000**; and

(3) the business must be a **small business** and, for *most* types of businesses, have average annual gross receipts less than **$30,720,000**.

Per DOT DBE Regulations, MTS *may not* count participation from certified minority owned businesses (MBE), disabled veteran owned businesses (DVBE), women owned businesses (WBE), small businesses (SB), lesbian gay bisexual transgender owned businesses (LGBTBE), or persons with disabilities businesses (PDBE) (collectively referred to as SBEs) toward meeting its DBE Triennial Overall Goal. Nonetheless, MTS encourages participation from, conducts outreach to, and tracks awards to SBEs.

IV. Race-Neutral Outreach Measures to Increase DBE and SBE Participation

A race-neutral DBE program means that there are no DBE contract specific goals and no advantages provided to interested DBE contractors when submitting bids or proposals. Successful bidders are chosen using race-neutral means, generally through a low-bid or best-value procurement process.

To increase DBE participation on MTS's federally assisted procurements, as well as SBE participation on all MTS's contracts, MTS conducts outreach to DBEs and SBEs in an effort to inform them of upcoming MTS procurements. The following are some of the race-neutral measures MTS has implemented:

1. outreach to new vendors to provide the benefits of DBE, MBE, DVBE, WBE, SB, PDBE and/or LGBTBE certification and what qualifications are necessary to become certified, as some may already qualify;

2. outreach to vendors requesting that they register on PlanetBids so they can receive automatic notification of upcoming MTS procurements;

3. for small purchase procurements in which MTS must seek out three (3) bids, MTS aims to advertise more of these procurement on PlanetBids so as to increase the potential of DBEs, and SBEs learning of the procurement, if such a contractor is available to perform the work;

4. for small purchase procurements in which MTS must seek out three (3) bids, seeking at least one (1) of those bids from a DBE or SBE, if available; and

5. attend and actively promote small business conferences and programs to alert DBEs and SBEs of upcoming MTS contracting opportunities and to educate about MTS's DBE program.

MTS also continued to attend San Diego Public Agency Consortium (PAC) bi-monthly meetings, as well as the Local Small Business Council bi-monthly meetings, virtually. At these meetings, public agencies discuss upcoming planned outreach events amongst the members and best practices regarding their agency's DBE and SB programs.

V. Federally Funded Procurements

Only contracts awarded and paid by MTS using federal funds (or a portion of federal funds) are reported to the FTA per DOT DBE Regulations. MTS generally reserves federal funds for transit vehicle procurements, transit facility improvements, state-of-good-repair vehicle or system preventative maintenance projects, and contracted fixed route and paratransit bus services. MTS generally uses local and state funds for administrative costs and other expenses (e.g. marketing, land management, office supplies).

VI. Summary of Semi-Annual DBE Report Achievement (Federal Funds Only)

The FTA Semi-Annual Report for October 1, 2024, to March 31, 2025, is the first of six reports in the triennial period of FFY 2025-2027. The following is information on federally funded contracts awarded, open and completed during October 1, 2024, to March 31, 2025 (excluding transit vehicle procurements per DOT DBE regulations).

a. Contracts Awarded

For this reporting period, MTS **achieved** its DBE Triennial Overall Goal of 5.6% for contracts awarded. MTS achieved **65.02%** DBE participation for contracts awarded, as shown below in Table 1.

Table 1: Federal Contracts Awarded

Federal Contract Awards/Commitments				**Goal**
REPORTING PERIOD	Total Federal $	DBE $	DBE %	vs 5.6%
Federal Funds: Oct 1, 2024 to Mar 31, 2025	$35,687,701.92	**$23,205,146.41**	**65.02%**	+59.42%

The main reason for why MTS was able to meet its DBE Triennial Overall Goal for contracts awarded was due to awarding a large multi-year contract to a DBE firm. This included: **Carlos**

Guzman, Inc., a **DBE firm,** for 5 years for accident body repair and refurbishment of trolley vehicles in the amount of **$23,198,835.36** (federal portion only).

b. Contracts Open

For this reporting period, MTS **did not achieve** its DBE Triennial Overall Goal of 5.6% for payments on open contracts. MTS achieved **3.63%** DBE participation for open contracts, as shown below in Table 2.

Table 2: Federal Contracts Open

Federal Contracts Open/Payments During Reporting Period				**Goal**
REPORTING PERIOD	Total Federal $	DBE $	DBE %	vs 5.6%
Federal Funds: Oct 1, 2024 to Mar 31, 2025	$23,199,096.01	**$842,128.23**	**3.63%**	-1.97%

The main reason why MTS was not able to meet its DBE Triennial Overall Goal for contracts opened was due to ongoing payments to **Transdev,** a **non-DBE firm**, for fixed route bus service, in the amount of $12,711,734.13 (federal portion only) paid between October 1, 2024 to March 31, 2025. These payments substantially diluted ongoing payments to contracts with DBE firms, such as a large contract to **NMS Management**, a **DBE firm**, for janitorial services, in the amount of **$836,666.14** (federal portion only) paid between October 1, 2024 to March 31, 2025.

c. Contracts Completed

For this reporting period, MTS **did not achieve** its DBE Triennial Overall Goal of 5.6% for contracts completed. MTS achieved **0.41%** DBE participation for contracts completed, as shown below in Table 3.

Table 3: Federal Contracts Completed

Federal Contracts Completed/Total Payments				**Goal**
REPORTING PERIOD	Total Federal $	DBE $	DBE %	vs 5.6%
Federal Funds: Oct 1, 2024 to Mar 31, 2025	$8,721,675.06	$36,073.49	**0.41%**	-5.19%

The main reason for why MTS was not able to meet its DBE Triennial Overall Goal for contracts completed during this six month period was due to closing out large contracts to non-DBE firms, which included, but is not limited to: 62nd Street Station Trackway Replacement construction project with **Balfour Beatty Infrastructure**, a **non-DBE firm,** total payments made during the life of this contract totaled $1,508,845.05 (federal portion only); and 4th and C grade crossing replacement with **Veterans Engineering**, a **DVBE firm,** total payments made during the life of this contract totaled $591,633.35 (federal portion only). Please note, MTS decides contract performance periods based on MTS business and operational needs. Every reporting period will differ on the number, type and dollar amount of contracts closed out. No large contracts with a DBE firm were closed out during this reporting period.

VII. Summary of Achievement Toward Meeting MTS's DBE Triennial Overall Goal

While the specific DBE participation rate for each six (6) month reporting period may fluctuate, the goal of the MTS DBE program is to achieve the 5.6% DBE Triennial Overall Goal as an average for the FFY 2025-2027 triennial period. MTS has **achieved** its DBE Triennial Overall Goal of 5.6% for FFY 2025-2027 thus far, as shown below in Table 4.

Table 4: DBE Achievement for FFY 2025-2027

<table>
<tr><th colspan="5">DBE Achievement for FFY 2025-2027</th></tr>
<tr><th>FFY</th><th>Reporting Period</th><th>Total Federal Awarded</th><th>Total DBE Awarded</th><th>DBE %</th></tr>
<tr><td>FFY 2025</td><td>Oct 1 24 to Mar 31 25</td><td>$35,687,701.92</td><td>$23,205,146.41</td><td>65.02%</td></tr>
<tr><td>FFY 2025</td><td>April 1 25 to Sept 30 25</td><td colspan="3" rowspan="5">In progress – not yet completed</td></tr>
<tr><td>FFY 2026</td><td>Oct 1 25 to Mar 31 26</td></tr>
<tr><td>FFY 2026</td><td>April 1 26 to Sept 30 26</td></tr>
<tr><td>FFY 2027</td><td>Oct 1 26 to Mar 31 27</td></tr>
<tr><td>FFY 2027</td><td>April 1 27 to Sept 30 27</td></tr>
<tr><td colspan="2">TOTAL</td><td>$35,687,701.92</td><td>$23,205,146.41</td><td>65.02%</td></tr>
<tr><td colspan="2">Achievement Toward Meeting FFY 2025-2027 DBE Triennial Overall Goal of 5.6%

(FFY 2025-2027 Total DBE Awarded ÷ FFY 2025-2027 Total Fed Awarded)</td><td colspan="3">65.02%
Achieved 65.02% towards DBE Overall Triennial Goal of 5.6%, thus far</td></tr>
</table>

VIII. Summary of DBE, WBE, MBE, DVBE, PDBE, LGBTBE and SB Participation for all Contracts (Regardless of Funding Source)

Although MTS may not count participation of MBE, DVBE, WBE, SB, PDBE and LGBTBE (collectively referred to as SBEs) towards achievement of its DBE Overall Triennial Goal, MTS does record the participation of these businesses to gauge the success of its program to foster small business participation. MTS encourages the participation of DBEs and SBEs on all of its contracts, no matter the funding source.

MTS's DBE and SBE participation rates for the reporting period, *using both local and federal funds*, are included below in Table 5.

Table 5: All Contracts Awarded (All Funding Sources)

All Contract Awards/Commitments (All Funding Sources)					
REPORTING PERIOD	**Total $**	**DBE $**	**DBE %**	**SBE $ (MBE, DVBE, WBE, SB, PDBE and LGBTBE)**	**SBE %**
Total Funds: Oct 1, 2024 to Mar 31, 2025	$147,588,727.57	$33,295,811.99	22.56%	$37,602,373.96	25.48%

To compare MTS's current achievements with past reporting periods, enclosed is a History of Semi-Annual Reports (Attachment A).

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. History of Semi-Annual DBE Reports

MTS History of DBE Semi Annual Reports

Contract Awards/Commitments*

	Federal DBE GOAL	REPORTING PERIOD	TOTAL DOLLARS AWARDED (fed & local)	Total DBE $$	Total DBE %	Total SBE $$	Total SBE %	Total Federal $$	Federal DBE $$	Federal DBE %	Federal SBE $$	Federal SBE %	Total Local $$	Local DBE $$	Local DBE %	Local SBE $	LOCAL SBE %
FFY19		**Oct 1 18 to Mar 31 19**	$ 73,790,097.91	$ 606,817.10	0.82%	$ 5,715,068.36	7.75%	$ 8,603,476.55	$ 204,022.26	**2.37%**	$ 182,110.81	2.12%	$ 65,186,621.36	$ 402,794.84	0.62%	$ 5,532,957.55	8.49%
		Apr 1 19 to Sept 30 19	$ 40,005,268.47	$ 6,243,719.33	15.61%	$ 1,796,894.06	4.49%	$ 9,005,016.32	$ 3,884,727.66	**43.14%**	$ 644,406.58	7.16%	$ 31,000,252.15	$ 2,358,991.67	7.61%	$ 1,152,487.48	3.72%
FFY20		**Oct 1 19 to Mar 31 20**	$ 52,022,126.82	$ 4,330,163.32	8.32%	$ 4,831,911.79	9.29%	$ 7,065,591.07	$ 84,861.22	**1.20%**	$ 1,309,065.78	18.53%	$ 44,956,535.75	$ 4,245,302.10	9.44%	$ 3,522,846.01	7.84%
		Apr 1 20 to Sept 30 20	$ 230,588,830.67	$ 636,712.08	0.28%	$ 2,322,909.77	1.01%	$ 130,881,224.89	$ 135,337.29	**0.10%**	$ 242,071.52	0.18%	$ 99,707,605.78	$ 501,374.79	0.50%	$ 2,080,838.25	2.09%
	2.9%	*Apr 1 20 to Sept 30 20 w/o First Transit contract (*for reference only*)*	*$ 47,280,121.00*	*$ 636,712.08*	*1.35%*	*$ 2,322,909.77*	*4.91%*	*$ 14,306,408.31*	*$ 135,337.29*	*0.95%*	*$ 242,071.52*	*1.69%*	*$ 32,973,712.69*	*$ 501,374.79*	*1.52%*	*$ 2,080,838.25*	*6.31%*
FFY21		**Oct 1 20 to Mar 31 21**	$ 546,248,722.19	$ 428,054.08	0.08%	$ 5,511,166.79	1.01%	$ 182,514,682.65	$ 45,759.00	**0.03%**	$ 369,213.11	0.20%	$ 363,734,039.54	$ 382,295.08	0.11%	$ 5,141,953.68	1.41%
		*Oct 1 20 to Mar 31 21 w/o Transdev contract (*for reference only*)*	*$ 39,863,273.69*	*$ 428,054.08*	*1.07%*	*$ 5,511,166.79*	*13.83%*	*$ 1,059,896.95*	*$ 45,759.00*	*4.32%*	*$ 369,213.11*	*34.83%*	*$ 38,803,376.74*	*$ 382,295.08*	*0.99%*	*$ 5,141,953.68*	*13.25%*
		Apr 1 21 to Sept 30 21	$ 96,111,004.32	$ 461,370.54	0.48%	$ 44,133,244.11	45.92%	$ 14,952,198.32	$ 44,380.72	**0.30%**	$ 712,640.36	4.77%	$ 81,158,806.00	$ 416,989.82	0.51%	$ 43,420,603.75	53.50%
FFY19-21	**2.9%**	**Oct 1, 2018 thru Sept 30, 2021 (6 semi-annual reports)**	**$ 1,038,766,050.38**	**$ 12,706,836.45**	**1.22%**	**$ 64,311,194.88**	**6.19%**	**$ 353,022,189.80**	**$ 4,399,088.15**	**1.25%**	**$ 3,459,508.16**	**0.98%**	**$ 685,743,860.58**	**$ 8,307,748.30**	**1.21%**	**$ 60,851,686.72**	**8.87%**
		*Oct 1, 2018 thru Sept 30, 2021 (6 semi-annual reports) w/o First Transit or Transdev contract (*for reference only*)*	*$ 349,071,892.21*	*$ 12,706,836.45*	*3.64%*	*$ 64,311,194.88*	*18.42%*	*$ 54,992,587.52*	*$ 4,399,088.15*	*8.00%*	*$ 3,459,508.16*	*6.29%*	*$ 294,079,304.69*	*$ 8,307,748.30*	*2.83%*	*$ 60,851,686.72*	*20.69%*
FFY22		**Oct 1 21 to Mar 31 22**	$ 58,074,628.88	$ 637,356.70	1.10%	$ 6,907,845.36	11.89%	$ 7,843,315.85	$ 234,599.40	**2.99%**	$ 760,885.51	9.70%	$ 50,231,313.03	$ 402,757.30	0.80%	$ 6,146,959.85	12.24%
		Apr 1 22 to Sept 30 22	$ 45,351,112.49	$ 670,801.19	1.48%	$ 1,810,431.39	3.99%	$ 6,977,851.08	$ 92,523.71	**1.33%**	$ 231,078.11	3.31%	$ 38,373,261.41	$ 578,277.48	1.51%	$ 1,579,353.28	4.12%
FFY23	**6.3%**	**Oct 1 22 to Mar 31 23**	$ 67,365,767.07	$ 10,440,863.02	15.50%	$ 12,221,020.20	18.14%	$ 17,806,277.45	$ 7,965,351.88	**44.73%**	$ 1,029,876.32	5.78%	$ 49,559,489.62	$ 2,475,511.14	5.00%	$ 11,191,143.88	22.58%
		Apr 1 23 to Sept 30 23	$ 53,799,232.47	$ 5,446,585.33	10.12%	$ 1,208,807.09	2.25%	$ 9,630,377.28	$ 2,237,323.28	**23.23%**	$ 126,527.09	1.31%	$ 44,168,855.19	$ 3,209,262.05	7.27%	$ 1,082,280.00	2.45%
FFY24		**Oct 1 23 to Mar 31 24**	$ 77,886,701.74	$ 4,246,084.11	5.45%	$ 8,310,162.54	10.67%	$ 11,394,054.87	$ 240,626.03	**2.11%**	$ 1,832,026.03	16.08%	$ 66,492,646.87	$ 4,005,458.08	6.02%	$ 6,478,136.51	9.74%
		Apr 1 24 to Sept 30 24	$ 73,649,043.32	$ 6,949,059.93	9.44%	$ 4,564,695.97	6.20%	$ 3,624,621.11	$ 75,249.65	**2.08%**	$ 871,257.12	24.04%	$ 70,024,422.21	$ 6,873,810.28	9.82%	$ 3,693,438.85	5.27%
FFY22-24	**6.3%**	**Oct 1, 2021 thru Sept 30, 2024 (6 semi-annual reports *IN PROGRESS*)**	**$ 376,126,485.97**	**$ 28,390,750.28**	**7.55%**	**$ 35,022,962.55**	**9.31%**	**$ 57,276,497.64**	**$ 10,845,673.95**	**18.94%**	**$ 4,851,650.18**	**8.47%**	**$ 318,849,988.33**	**$ 17,545,076.33**	**5.50%**	**$ 30,171,312.37**	**9.46%**
FFY25		**Oct 1 24 to Mar 31 25**	$ 147,588,727.57	$ 33,295,811.99	22.56%	$ 37,602,373.96	25.48%	$ 35,687,701.92	$ 23,205,146.41	**65.02%**	$ 1,490,978.37	4.18%	$ 111,901,025.65	$ 10,090,665.58	9.02%	$ 36,111,395.59	32.27%
		Apr 1 25 to Sept 30 25	$ -	$ -	#DIV/0!	$ -	#DIV/0!			**#DIV/0!**		#DIV/0!			#DIV/0!		#DIV/0!
FFY26	**5.6%**	**Oct 1 25 to Mar 31 26**	$ -	$ -	#DIV/0!	$ -	#DIV/0!			**#DIV/0!**		#DIV/0!			#DIV/0!		#DIV/0!
		Apr 1 26 to Sept 30 26	$ -	$ -	#DIV/0!	$ -	#DIV/0!			**#DIV/0!**		#DIV/0!			#DIV/0!		#DIV/0!
FFY27		**Oct 1 26 to Mar 31 27**	$ -	$ -	#DIV/0!	$ -	#DIV/0!			**#DIV/0!**		#DIV/0!			#DIV/0!		#DIV/0!
		Apr 1 27 to Sept 30 27	$ -	$ -	#DIV/0!	$ -	#DIV/0!			**#DIV/0!**		#DIV/0!			#DIV/0!		#DIV/0!
FFY25-27	**5.6%**	**Oct 1, 2024 thru Sept 30, 2027 (6 semi-annual reports *IN PROGRESS*)**	**$ 147,588,727.57**	**$ 33,295,811.99**	**22.56%**	**$ 37,602,373.96**	**25.48%**	**$ 35,687,701.92**	**$ 23,205,146.41**	**65.02%**	**$ 1,490,978.37**	**4.18%**	**$ 111,901,025.65**	**$ 10,090,665.58**	**9.02%**	**$ 36,111,395.59**	**32.27%**

***Transit Vehicle Procurements (buses, trolleys) from Transit Vehicle Manufacturers (TVM) are not included in this Report per DOT DBE Regulations. TVMs have their own DBE Program, Goals and Reporting requirements. Inventory procurements are also not included.**

Only at time an inventory item is issued from store room will the federal/local breakdown be known, not at the time of purchase. *

Metropolitan Transit System

Semiannual Uniform Report of Disadvantaged Business Enterprise (DBE) Awards and Payments

Board of Directors

DBE Program

- As a Federal Transit Administration (FTA) grant recipient, MTS must comply with DBE Regulations at 49 CFR Part 26.
  - Develop a DBE Program (MTS Board Policy No. 26)
    - MTS has a race-neutral program
  - Conduct Outreach Measures to DBE and other SB concerns
    - Also outreach to Minority Owned Businesses (MBE), Woman Owned Businesses (WBE), Disabled Veteran Businesses (DVBE), LGBT Businesses (LGBTBE), and Persons with Disabilities Businesses (PDBE)
  - Establish a Triennial Overall DBE Goal
    - Current Triennial Goal is 5.6% for FFY25-27
    - Only may count achievement towards DBE Overall Goal from DBE certified firms
  - Report DBE Achievement Semi-Annually
  - Shortfall Analysis if not meeting Overall Goal in FY

DBE Semi-Annual Report

- For period of October 1, 2024 to March 31, 2025
  - FTA Funded Contracts Awarded
    - FTA primary focus as to determining whether a shortfall
    - 65.02% DBE Achievement (*exceeded MTS's DBE Overall Goal of 5.6%)*
    - Carlos Guzman, DBE, body repair of trolleys, awarded $23mil (federal $ only)
  - FTA Funded Contracts Open
    - 3.63% DBE Achievement
    - Payments of $836k (federal $ only) to NMS Management, DBE, for janitorial services were diluted by payments to other large non-DBE contracts
  - FTA Funded Contracts Completed
    - 0.41% DBE Achievement
    - No large DBE contracts closed out during this reporting period

MTS's Outreach Event July 9th

- MTS is hosting its own Virtual Outreach Event on July 9th between 8:30am-1:45pm
- All vendors are invited to attend
- Topics include technical assistance, upcoming MTS procurements, and information on how to apply and benefits of becoming a certified firm
- Presenters include various MTS staff, Caltrans, CA DGS, CA Supplier Clearinghouse, and PlanetBids

Questions/Comments

Metropolitan Transit System

Agenda Item No. 25

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Transit Operations Insourcing Feasibility Study – Task 2 – Operational and Administrative Concept Plan (James Gerken and Russ Chisholm with Transportation Management Design (TMD), Inc. and Mike Daney)

INFORMATIONAL ONLY

Budget Impact

No budget impacts.

DISCUSSION:

On July 18, 2024 (Agenda Item (AI) 16), the San Diego Metropolitan Transit System (MTS) Board of Directors authorized the Chief Executive Officer (CEO) to execute a contract with TMD to perform a Transit Operations Insourcing Feasibility Study.

At the March 13, 2025 (AI No. 26), Board of Directors meeting, TMD, provided an overview of the Transit Operations Insourcing Feasibility Study, including a summary of MTS' current operations existing conditions, along with key focus areas of the study, work plan and study timeline.

This eighteen-month study aims to determine the feasibility of bringing current contract-operated fixed bus routes, minibus transit, and paratransit services in-house, so that all functions are performed by MTS employees.

The project is divided into four phases: Existing Conditions, Operational & Administrative Concept Plan, Implementation Transition Strategy & Schedule, and Cost Implications & Impacts Analysis

This report, the second phase of the study, will provide an overview of operating concepts that would allow MTS to bring contracted operations in-house, highlighting key differences, staffing needs and functional responsibilities, and how these operating units conduct business for MTS and our riders.

The final goal of this study is to provide the MTS Board of Directors with a clear picture of the steps, efficiencies, challenges, and cost impacts to migrate the current contracted operated services into the directly operated services portfolio of bus services.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, julia.tuer@sdmts.com

Attachment: A. MTS Insourcing Feasibility Study – Operational & Administrative Concept Plan

MTS Insourcing Feasibility Study
Operational & Administrative Concept Plan
June 2025 | FINAL

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List of Acronyms

ADA	Americans with Disabilities Act [of 1990]
ATU	Amalgamated Transit Union
BEB	Battery Electric Bus
CalPERS	California Public Employees' Retirement System
CBA	Collective Bargaining Agreement
CDL	Commercial Driver's License
CNG	Compressed Natural Gas
CPD	[MTS] Copley Park Division
DMV	[California] Department of Motor Vehicles
ECD	[MTS] East County Division
FR	Fixed Route [Bus Transit]
FTA	Federal Transit Administration
FTE	Full-Time Equivalent [Employee]
FY	Fiscal Year
IAD	[MTS] Imperial Avenue Division
IBEW	International Brotherhood of Electrical Workers
IT	Information Technology
KMD	[MTS] Kearny Mesa Division
MTS	[San Diego] Metropolitan Transit System
O&M	Operating and Maintenance [Facility]
OEM	Original Equipment Manufacturer
PV	[California DMV's] Passenger Vehicle [Endorsement]
RFP	Request for Proposal
RTMS	Regional Transit Management System
SBD	[MTS] South Bay Division
SGR	State of Good Repair
SIR	Self-Insured Retention
SOP	Standard Operating Procedure(s)
VDS	[Transdev's] Visual Dispatch System

1. Executive Summary

1.1 Project Overview

The San Diego Metropolitan Transit System (MTS) Insourcing Feasibility Study seeks to understand the feasibility of insourcing current contract-operated fixed bus route and minibus transit and paratransit services, i.e., bringing them 'in house,' with all functions performed by MTS employees. [1] This wide-ranging study is intended to provide the MTS Board of Directors with a clear and holistic picture of what it would take, what it will cost, and any impediments associated with converting any of the services. It is important to note that this study does not provide a singular recommendation or set of recommendations to MTS and its Board regarding insourcing. The intention is to provide clarity on the feasibility of insourcing and develop a road map for the different insourcing options should MTS pursue this in the future. The study examines fixed route bus transit, MTS Access paratransit, and MTS's fixed route minibus service. The MTS Trolley rail system is already operated in-house and is not part of this study.

The project began with an Existing Conditions review (Task 1), to develop a baseline understanding of both the MTS-operated and contractor-operated transit services and to identify any key differences in the way either entity conducts business. This Operational & Administrative Concept Plan report (Task 2) details the findings from an analysis of the changes to MTS that would be necessary to insource fixed route bus service and/or Paratransit, including new or expanded responsibilities or functional areas and projected changes to budgeted positions. This report also provides an overview of key hurdles or challenges to insourcing and elements requiring close consideration in the implementation planning process.

The key findings from this report will help to inform the final two tasks of the study which are noted below.

- Task 1: Existing Conditions
- Task 2: Operational & Administrative Concept Plan (*This report*)
- Task 3: Implementation Transition Strategy & Schedule
- Task 4: Cost Implications & Impacts Analysis

1.2 Key Findings

Any of the insourcing scenarios discussed in this report carry significant impacts for MTS, especially Scenarios 1 and 2 that would bring the Transdev fixed route divisions in-house.

- The most notable impact to MTS in these scenarios is a **substantial increase to the number of budgeted full-time positions** at the agency and addressing the pay and benefit differentials. While estimated cost impacts were not part of this task and will follow in a later task, this major staffing increase has the potential to significantly increase MTS's annual operating costs for the same service as compared to what MTS currently pays Transdev.

[1] The current contractor is Transdev Services Inc. for all three services.

- Beyond this staffing (and potential cost) impact, a second major challenge is **resolving the labor representation and bargaining unit structure** issues discussed in this report. Either option for converting represented Transdev employees to MTS employees has significant challenges and will require close consideration of the relevant labor unions' positions and interests and careful negotiation to avoid issues that could lengthen the implementation timeline or hinder the process if the MTS Board pursues insourcing.
- The third major structural challenge relates to the **Maintenance apprenticeship program** requirements for Mechanics. Transdev hires directly for the level that is open while MTS hires at an entry level and then develops their maintenance workforce in-house through the apprenticeship program.

Insourcing considerations or challenges are discussed for each department or functional area in Section 3. The most notable issues agency-wide under each scenario are presented below in *Table 1-1* and in Section 4. The four insourcing scenarios shown in *Table 1-1* are discussed further in Section 2.2, and include insourcing of all contracted services, insourcing of fixed route (FR) and Minibus (Mini), insourcing of only Paratransit (Para), or a do-nothing alternative.

Table 1-1: Key Issues by Scenario

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing Impacts	• Preliminary estimates for impacts to budgeted FTEs counts are shown in *Table 4-2*.			No Change
Labor Representation	• Resolution of labor representation for each of the insourced Transdev operating elements. • Conflict between current non-represented MTS Supervisors and represented Transdev Supervisors.	• Resolution of labor representation for each of the insourced Transdev operating elements. • Conflict between current non-represented MTS Supervisors and represented Transdev Supervisors.	• Retention of current labor representation for Paratransit services.	No Change
Wage Rate Differential	• Material difference between MTS and Transdev.	• Material difference between MTS and Transdev fixed route services.	• Material difference between MTS and Transdev's Paratransit staff for similar job classifications.	No Change
Work Rule Differences	• Detailed in Labor Section.	• Detailed in Labor Section.	• No existing in-house MTS Paratransit operation, but similar differences to resolve for similar job classifications.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Expanded MTS Human Resources Effort	• Significant burden for expanded MTS recruitment and hiring to accommodate more than a doubling of the current MTS operational workforce.	• Significant burden for expanded MTS recruitment and hiring to accommodate an approximate doubling of the current MTS fixed route operational workforce.	• Significant burden for expanded MTS recruitment and hiring to accommodate the additional staffing needs of the paratransit operational workforce.	No Change
Disparate Maintenance Hiring Philosophy	• MTS hires Mechanics at the entry level and trains them via a prescribed program for advancement. Transdev hires Mechanics at the job level that is open and has a less structured training procedure. • Beyond the general labor representation issues, MTS will also need to resolve the conflict between the current requirement that MTS Mechanics complete the MTS Apprenticeship program and the likely need to hire existing Transdev mechanics who have not completed the program.			No Change

1.3 Next Steps

The project team will continue to work with MTS staff across departments to refine the insourcing scenarios and ensure thorough identification and understanding of impacts associated with potential insourcing. Through the remainder of 2025, the team will develop the insourcing implementation strategies and cost impacts as the insourcing feasibility study progresses through Tasks 3 and 4.

2. Introduction

2.1 Report Overview and Purpose

2.1.1 REPORT STRUCTURE AND PROCESS

This Operational & Administrative Concept Plan document builds on the Existing Conditions report developed in the first task of the project. The project team utilized the analysis and key findings from that report, supplemented by additional data and information from MTS and Transdev and follow-up meetings with MTS staff, to identify the key hurdles, challenges, and necessary changes to each department or functional area under each insourcing scenario.

Data Sources

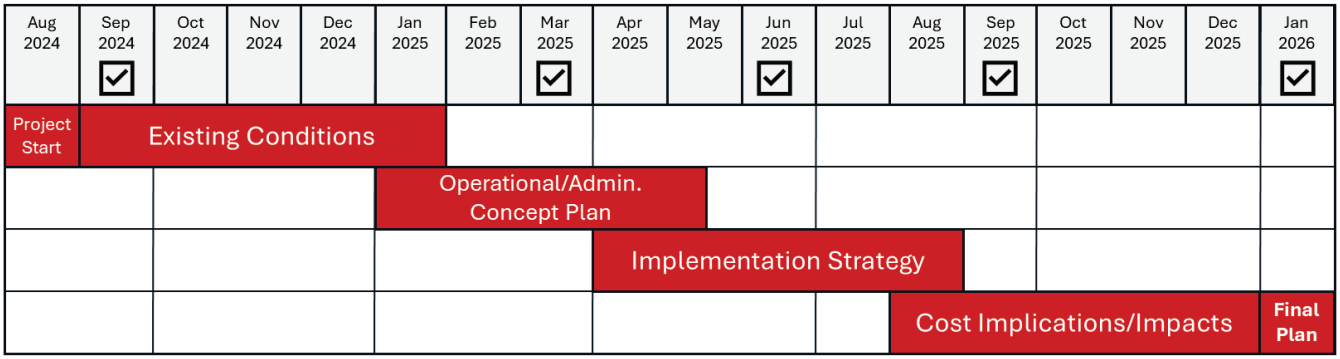
Data and information utilized in this report that were not publicly available were provided by MTS and Transdev. This includes documents, contracts and agreements, and quantitative datasets within the organizational areas reviewed in this report.

2.1.2 PROJECT SCHEDULE

The project began in August 2024 with a planned 18-month timeline and is scheduled to conclude in early 2026. As each phase of the project progresses, MTS staff and the consultant team will provide updates to the MTS Board to keep them apprised of project findings and seek their input on key challenges and opportunities associated with the four scenarios. The current project schedule is shown in *Figure 2-1*.

Figure 2-1: Project Schedule

☑ **Board Update and Discussion**



2.2 Scenarios Under Consideration

This study was directed to consider four scenarios for the future of MTS's fixed route, paratransit, and minibus operations. This report presents the insourcing concepts within the parameters of these scenarios. The next phase of this project (implementation strategies for each scenario) will present more opportunities to consider the benefits and challenges to each scenario as well as implementation phasing or other choices that may shape the final character of one or more scenarios.

Table 2-1: Insourcing Scenarios Summary

Insourced Services	Fixed Route	Minibus	Paratransit
Scenario 1	X	X	X
Scenario 2	X	X	
Scenario 3			X
Scenario 4			

Scenario 1: Insource all contract operations (fixed route, minibus, and paratransit)

Under this scenario, all MTS branded - services would be directly operated. All operations, maintenance, and other functional areas currently performed by contractor employees would be assumed by direct employees of MTS. MTS would assume management of day-to-day operations of the South Bay Division (SBD), East County Division (ECD), and Copley Park Division (CPD).

Scenario 2: Insource contract-operated fixed route and minibus services only

Under this scenario, fixed route bus services currently operated by Transdev out of the South Bay and East County divisions would be insourced, along with the minibus services currently operated by Transdev out of Copley Park. MTS would assume day-to-day operational control of SBD and ECD. Transdev would continue to operate CPD with only Paratransit services. Minibus operations and fleet would be reassigned to one of the four fixed route divisions.

Scenario 3: Insource paratransit operations only

Under this scenario, only the MTS Access paratransit service would be insourced. The current contract-operated fixed route bus and minibus services would remain with a contractor. MTS would assume day-to-day operational control of CPD with only Paratransit operations at that division. Minibus operations and fleet would continue to be operated by Transdev, but would need to be reassigned to either SBD or ECD.

Scenario 4: No change from present (Do Nothing)

Under this scenario, nothing would change in the current situation. MTS would continue to operate the existing directly operated fixed route service at IAD and KMD. The fixed route bus operations at the South Bay and East County divisions, and the paratransit and minibus operations at Copley Park Division, would remain outsourced.

3. Functional Area/Organizational Assessment

This section examines each of MTS's functional areas or departments related to bus operations, maintenance, and administrative support for the currently contracted services and provides an overview of the key hurdles or impacts related to each of the insourcing scenarios. Each subsection outlines the key impacts or considerations for each functional area/department. Following that, Section 4 of this report provides a top-level summary of the most important and consequential impacts related to insourcing as well as a preliminary projection of budgeted MTS headcount requirements (relative to the proposed FY2026 budgeted full-time equivalent (FTE) positions).

This section assumes that any insourced employees will be subject to all MTS policies, procedures, and practices from day one for each position unless superseded by a collective bargaining agreement. Many of the insourced employees will need training in MTS policies, procedures, and practices, as well as software and technology regularly utilized in the analogous MTS positions (e.g., HASTUS Daily module vs. Transdev's VDS software).

3.1 Contracts

MTS currently holds two contracts with Transdev for outsourced operations. The fixed route contract encompasses operations at the South Bay Division (SBD) and East County Division (ECD), and its base term is in effect through June 30, 2027. The contract includes two, two-year option periods, which would extend the June 30 expiration to 2029 or 2031. The second contract, which was inherited from First Transit after Transdev acquired that company in 2023, encompasses the MTS Access paratransit and fixed route minibus services operated out of Copley Park Division (CPD). That contract expires on June 30, 2026, with two, two-year option periods which would extend the June 30 expiration to 2028 or 2030. *Table 3-1* summarizes key considerations, challenges, or impacts for the two contracts as they relate to the insourcing scenarios.

Table 3-1: Contracts Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Transdev Fixed Route Contract	• MTS will need to establish an end-date for Transdev services ("disentanglement") in line with an achievable implementation timeline. • If not exercising the contract's "termination for convenience" clause, possible transition dates are **June 30** in either **2027**, **2029**, or **2031**. These are the end dates of the contract's base term and two two-year option periods.		No Change	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Transdev Minibus/Paratransit Contract	• MTS will need to establish an end-date for Transdev services ("disentanglement") in line with an achievable implementation timeline. • If not exercising the contract's "termination for convenience" clause, possible transition dates are **June 30** in either **2026**, **2028**, or **2030**. These are the end dates of the contract's base term and two two-year option periods. • Insourcing service from this contract, with different base-term and option expirations than the fixed route contract, will require either a two-phase implementation or a termination for convenience.	• MTS will need to execute a contract amendment, or possibly a new contract, with Transdev to disentangle solely the **minibus** portion of the services administered by this contract. • Insourcing service from this contract, with different base-term and option expirations than the fixed route contract, will require either a two-phase implementation or a termination for convenience.	• MTS will need to execute a contract amendment, or possibly a new contract, with Transdev to disentangle solely the **paratransit** portion of the services administered by this contract. • Minibus operations could be shifted to the fixed route contract and operated out of SBD and/or ECD through a contract amendment. (Note that minibuses use propane fuel, which is currently only available at CPD.)	No Change

3.1.1 THIRD-PARTY CONTRACTS

This section details the third-party contracts that MTS and Transdev currently hold with outside vendors for materials or services and how they would be impacted under the insourcing scenarios.

MTS-Controlled Contracts and Vendors

The third-party contracts owned by MTS are detailed in *Table 3-2*. In general, insourcing would not have a major impact on these contracts as MTS would continue to utilize the materials or services and MTS is already a party to the contracts. With any contracts where the goods or services provided are currently utilized by Transdev employees, MTS will need to update the contract language to reflect that MTS is now operating the service and/or inform the vendor of new points of contact or procedures when delivering materials or engaging in the contract's stated service.

Table 3-2: MTS-Controlled Third-Party Contracts Insourcing Considerations

Item & Current Contractor	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Compressed Natural Gas (CNG) Fuel – Trillium	• Update contract to reflect change in operation to MTS		No Change	No Change
CNG Fueling Station O&M Services and Equipment Replacement – Trillium	• Update contract to reflect change in operation to MTS		No Change	No Change
Propane Fuel – Suburban Propane	• Update contract to reflect change in Minibus operation to MTS • Address potential move of minibus operations away from CPD, the only division with propane fueling capabilities.		• Update contract to reflect change in Paratransit operation to MTS • Address potential move of minibus operations away from CPD, the only division with propane fueling capabilities.	No Change
Battery Electric Bus (BEB) Overhead Charging infrastructure – Heliox	• Update contract to reflect change in operation to MTS		No Change	No Change
BEB Charge Management Software – BP Pulse Fleet	• Update contract to reflect change in operation to MTS		No Change	No Change
BEB Fleet Management Software – ChargePoint ViriCiti	• Update contract to reflect change in operation to MTS		No Change	No Change
Transmissions Rebuilds – HD Industries	• Update contract to reflect change in operation to MTS		No Change	No Change
Cummins In-Frame Overhauls – Cummins	• Update contract to reflect change in operation to MTS		No Change	No Change
RTMS Radio Maintenance – Motorola	• Update contract to reflect change in operation to MTS			No Change
RTMS Hardware/Software Support-Conduent	• Update contract to reflect change in operation to MTS			No Change
CPD Dispatch Consoles, Radios, and Air Time Services – Mobile Relay Associates	No Change	• Update contract to reflect change in Minibus operation to MTS	• Update contract to reflect change in Paratransit operation to MTS	No Change
Cell Service for Paratransit Tablets – Verizon Wireless	No Change	No Change	• Update contract to reflect change in Paratransit operation to MTS	No Change

Item & Current Contractor	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
ADA Paratransit Certification – MTM Transit	No Change	No Change	• Update contract to reflect change in Paratransit operation to MTS	No Change
Passenger Facilities and Bus Stop Maintenance – 26 different Subcontractors (See Appendix)	No Change			No Change
Facility CCTV Maintenance – ESS	• Update contract to reflect change in operation to MTS			No Change

Transdev-Controlled Contracts and Vendors

The third-party contracts owned by Transdev for the South Bay, East County, and Copley Park divisions are detailed in *Table 3-3*. In general, insourcing would require that MTS enter into a new contract with any vendor currently providing a necessary material or service for Transdev operations that is not already supplied by an MTS vendor or can be performed in-house by MTS employees.

Table 3-3: Transdev-Controlled Third-Party Contracts Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
ADA Paratransit Taxi Services – Yellow Taxi Group	• MTS will need to negotiate and enter into a new contract with Yellow Taxi Group to ensure continuity of services for MTS Access customers • Alternatively, MTS will need to procure a new vendor for Access taxi service	No Change	• MTS will need to negotiate and enter into a new contract with Yellow Taxi Group to ensure continuity of services for MTS Access customers • Alternatively, MTS will need to procure a new vendor for Access taxi service	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Outside Labor – five vehicle maintenance-related vendors[2]	• Continued contracting with these vendors for SBD and ECD will depend on how MTS currently handles these activities.	• Continued contracting with these vendors for SBD and ECD, including the Minibus fleet, will depend on how MTS currently handles these activities.	No Change	No Change
Towing – one vendor	• Continued contracting with these vendors for SBD and ECD will depend on how MTS currently handles these activities.	• Continued contracting with these vendors for SBD and ECD, including the Minibus fleet, will depend on how MTS currently handles these activities.	No Change	No Change
Environmental Services – seven vendors	• Continued contracting with these vendors for SBD and ECD will depend on how MTS currently handles these activities.	• Continued contracting with these vendors for SBD and ECD, including the Minibus fleet, will depend on how MTS currently handles these activities.	No Change	No Change
Bus Body Work – three vendors	• MTS currently manages most bodywork in-house for its fixed route fleet and undertakes some work for the Transdev-operated fleet. • MTS will need to assess its ability to handle a similar volume of body work with the insourced fleet, and if needed increase staffing or engage third-party vendors.	• MTS currently manages most bodywork in-house for its fixed route fleet and undertakes some work for the Transdev-operated fleet. • MTS will need to assess its ability to handle a similar volume of body work with the insourced fleet, and if needed increase staffing or engage third-party vendors.	No Change	No Change

[2] See Appendix for a list of all of Transdev's current outside vendors.

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Buildings & Grounds – 16 vendors	• Continued contracting with these vendors for SBD and ECD will depend on how MTS currently handles these activities.	• Continued contracting with these vendors for SBD and ECD will depend on how MTS currently handles these activities.	No Change	No Change
Janitorial Services – one vendor	• Continued contracting with these vendors for SBD and ECD will depend on how MTS currently handles these activities.	• Continued contracting with these vendors for SBD and ECD will depend on how MTS currently handles these activities.	No Change	No Change

3.1.2 CONTRACT SERVICES MANAGEMENT

The Contract Services division currently has 8.5 budgeted FTEs, headed by a director, and manages two different functions – contract services (4.5 FTEs) and passenger facilities (3 FTEs), which oversee bus stops for both in-house and contracted services. For contracted transit operations and maintenance, this includes a Director of Contract Services, a Senior Contract Operations Administrator, a Contract Operations Administrator, a Manager of Paratransit and Minibus, a Supervisor of Paratransit, and one intern (0.5 FTE). Management of bus passenger facilities includes a Supervisor of Passenger Facilities and two Passenger Facilities Coordinators. The biggest impact to this area as a result of insourcing would be a decrease in the number of required budgeted positions.

Table 3-4: Contract Services Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing (Budgeted Positions)	• The current 5.5 FTE positions managing the Transdev operations and maintenance contracts will no longer be needed. • Passenger Facilities Supervisor and Passenger Facilities Coordinator positions would remain unchanged.	• MTS Contract Services management of Transdev responsibilities would be reduced to Paratransit only, resulting in a reduction of 3.5 FTE positions. • Passenger Facilities Supervisor and Passenger Facilities Coordinator positions would remain unchanged.	• MTS Contract Services management of Paratransit would be eliminated, possibly resulting in a reduction of 2.0 FTE positions. • Passenger Facilities Supervisor and Passenger Facilities Coordinator positions would remain unchanged.	No Change

3.2 Capital Assets

All Operations and Maintenance (O&M) facilities currently used by Transdev (South Bay Division, East County Division, and Copley Park Division) are owned by MTS. MTS periodically inspects and audits each of the facilities and designs, approves, and funds any major improvements.

Table 3-5: Capital Assets Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Operating & Maintenance Facilities	• MTS should conduct a full audit of the facilities (SBD, ECD, CPD) to ensure state of good repair (SGR) and contract compliance prior to operations handover. • Insourcing would require that day-to-day maintenance and repair be transferred to MTS. Specific responsibilities within Transdev managed and staffed facilities would need to be absorbed by MTS. This includes above-ground Diesel fuel tank monitoring, general CNG station monitoring, third party vehicle lift inspection contracts, Electric Charging stations monitoring, building and utility repairs and upkeep, yard and building cleaning, and landscaping services and maintaining LEED Certifications. • Most of the support equipment at these facilities are also owned by MTS. Any individual items that may be owned by Transdev (office/staff furniture) would have to be removed and replaced or purchased from Transdev. Transdev-supplied computer equipment would need to be replaced with comparable MTS-integrated units. • Most of the fleet and facilities spare parts inventory Is purchased by Transdev and these would be purchased by MTS or removed by Transdev. MTS will need to conduct an audit to confirm parts inventory ownership, quality, quantity, and value.	• MTS should conduct a full audit of the facilities (SBD, ECD) to ensure state of good repair and contract compliance prior to operations handover. (CPD audit only if minibus stays at that facility.) • All discussions for Scenario 1 apply to Scenario 2 for SBD and ECD. • Insourcing implications for CPD depend on how paratransit and minibus services are disentangled and which service remains at CPD. • Most of the spare parts inventory Is purchased by Transdev and these would be purchased by MTS or removed by Transdev. MTS will need to conduct an audit to confirm parts inventory ownership, quality, quantity, and value.	• MTS should conduct a full audit of the CPD facility to ensure state of good repair and contract compliance prior to operations handover. • Decision will be needed for Minibus operating base – with Paratransit moving to MTS, Minibus operations will need to transfer to SBD and/or ECD. • No change for SBD or ECD • Most of the fleet and facilities spare parts inventory Is purchased by Transdev and these would be purchased by MTS or removed by Transdev. MTS will need to conduct an audit to confirm parts inventory ownership, quality, quantity, and value.	No Change
Passenger Facilities and Bus Stops	• No Change. MTS currently owns all assets and parts inventory.			No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Revenue Vehicles	• All buses, minibuses, and paratransit vans assigned to SBD, ECD, and CPD are procured and owned by MTS and used by Transdev under an Operating Agreement. • The contract-operated fixed route vehicles are fully compatible with the remainder of the MTS fleet and can be directly operated by MTS, • The Commuter Bus fleet assigned to ECD have non-registering fareboxes, requiring additional effort for emptying and cash counting as compared to registering fareboxes present on the rest of the fleet. • Transdev-operated revenue vehicles currently have a secondary camera/monitoring system (Lytx DriveCam) that will need to be removed from all vehicles or transferred per MTS/Transdev negotiation. • MTS audits and periodically inspects the Transdev-operated fleet to assure that conformance with proper maintenance is being provided. Prior to transfer, MTS should undertake a comprehensive close-out audit to assure State of Good Repair and that all equipment is included and comparable to that on the MTS fleet. • Insourcing would require that the operation, cleaning, and maintenance of these vehicles be transferred to MTS.	• All buses assigned to SBD and ECD are procured and owned by MTS and used by Transdev under an Operating Agreement. • The contract-operated fixed route vehicles are fully compatible with the remainder of the MTS fleet. • The Commuter Bus fleet assigned to ECD have non-registering fareboxes, requiring additional effort for emptying and cash counting as compared to registering fareboxes present on the rest of the fleet. • Transdev-operated revenue vehicles currently have a secondary camera/monitoring system (Lytx DriveCam) that will need to be removed from all vehicles or transferred per MTS/Transdev negotiation. • The fixed-route minibus fleet would need to be transferred to one or more of the four fixed route facilities. • MTS audits and periodically inspects the Transdev-operated fixed route fleet to assure that conformance with proper maintenance is being provided. Prior to transfer, MTS should undertake a comprehensive close-out audit.	• The non-Paratransit minibus fleet would need to be transferred to one or more of the Transdev-operated fixed route facilities (SBD and/or ECD).	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
		• Insourcing would require that the operation, cleaning, and maintenance of these fixed route vehicles be transferred to MTS.		
Non-Revenue Vehicles	• MTS would need to increase the number of leased non-revenue vehicles to ensure adequate vehicles are available to support needed operations. • Prior to leasing of any additional non-revenue vehicles to support insourced operations and maintenance, MTS should conduct an assessment of actual need relative to existing non-revenue fleet quantity, locations, and deployments and changing schedule construct requirements.		• MTS would need to increase the number of leased non-revenue vehicles to ensure adequate vehicles are available to support needed operations.	No Change

3.3 Finance & Accounting

This section discusses potential impacts to the MTS Finance Department and activities overseen by this group. Key impacts or likely changes that would be needed under the insourcing scenarios are shown in *Table 3-6*. As many of the administrative and oversight responsibilities of the Transdev contract and the contracted transit services are overseen by other departments (e.g., Contract Services), it is expected that the biggest impact to MTS Finance will be the need for additional staffing. Most of this need will fall within the accounting and payroll areas, as insourcing would dramatically increase the number of MTS-employed operating staff and Accounts Payable duties.

Table 3-6: Finance & Accounting Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing (Budgeted Positions)	• This would entail a need for MTS resources to handle a variety of additional activities, including payroll services for a larger employee population and increased financial activity associated with additional purchasing activities. • MTS Accounting-related staff would not need to review the financial reports currently required from Transdev (bonus/penalties, completed trips, pass-thru costs, monthly mileage, etc.) to generate payments against submitted invoices. • This scenario may require as many as 12 additional FTE positions.	• This would entail a need for MTS resources to handle a variety of additional fixed route activities, including payroll services for a larger employee population and increased financial activity associated with additional purchasing activities. • MTS Accounting related staff would not need to review the numerous fixed-route related financial reports currently required from Transdev (bonus/penalties, completed trips, pass-thru costs, monthly mileage, etc.) to generate payments against submitted invoices. Paratransit financial reports would still need review. • This scenario may require as many as 9 additional FTE positions.	• This would entail a need for MTS resources to handle a variety of additional Paratransit activities, including payroll services for a larger employee population and increased financial activity associated with additional purchasing activities. • MTS Accounting related staff would not need to review the numerous Paratransit-related financial reports currently required from Transdev (bonus/penalties, completed trips, pass-thru costs, monthly mileage, etc.) to generate payments against submitted invoices. Fixed route financial reports would still need review. • This scenario may require as many as 3 additional FTE positions.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Fare Collection	• MTS currently holds a contract with the same cash transportation vendor as Transdev, Sectran Security. • MTS would need to expand the scope of this contract to include cash transportation from any of the insourced divisions.			No Change
Insurance Policies	• MTS would be required to increase various forms of insurance coverage currently supplied by Transdev (covered as a contract cost) at potentially different rates.			No Change
Retirement Plan Costs	• MTS would be required to have an updated actuarial valuation to determine the impact of adding insourced non-represented employees into an MTS (or other government) managed retirement plan. Represented employee retirement plans would be handled separately. • This audit will address costs of employer matched contributions, impacts of higher position levels and potential pre-payments for adding a significant number of new employees into the current MTS retirement plan. • The circumstances with insourcing represented Transdev employees is less clear with two options available – maintaining all current CBAs and bargaining units or consolidating the bargaining units to those existing for MTS. As these individuals would no longer be employed by Transdev, they would need to be incorporated into MTS's defined contribution plan on similar terms as MTS employees in equivalent titles.			No Change

3.4 Procurement and Materials Management

Key capital assets are all owned by MTS and share commonality within service type or fleet groups. Currently, MTS and Transdev have separate procurement efforts with significant overlap in specific materials and supplies acquisition.

Table 3-7: Procurement Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Integration with MTS Procurement Systems and Processes	• For any Transdev-procured fleet or facility parts, MTS should reconcile with its internal approved parts list and manifest to ensure compliance and conformity. Material forecasting processes will also need to be integrated to ensure that parts availability remains high and minimizes stock-outs. CPD has a unique revenue fleet for Paratransit and Minibus and will need special transitioning.			No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing (Budgeted Positions)	• Additional MTS purchasing requirements for fleet and facility parts will likely increase staffing requirements at the administrative level by 2.0 to 4.5 FTEs, with the addition of a new revenue fleet type (Paratransit and/or Minibus vehicles). The increased dollar value for fleet and facility parts purchases by MTS may result in more formal requirements imposed to solicit such goods and services. • As Transdev-managed third-party contracts will expire after MTS assumption of existing contracts, new vendor contracts will need to be developed to maintain continuity of required services. • MTS will need to staff additional FTE positions at the facility storerooms for parts and materials management in accordance with current staffing coverage at IAD and KMD. The projected increase for scenarios 1, 2, and 3 are +19, +14, and +9 FTES, respectively.			No Change

3.5 Legal

Under any of the insourcing scenarios, MTS will need to anticipate any and all legal implications associated with converting contracted services to in-house operation and the conversion of Transdev employees to MTS positions. As Transdev's San Diego operation is operated on behalf of MTS, who are a Federal Transit Administration (FTA) funding recipient, the current contract services are subject to the same oversight and compliance with FTA, Americans with Disabilities (ADA), and other regulations as MTS's directly operated services. Given this, the most notable insourcing impacts from a legal standpoint relate to risk management and claims and liabilities as well as compliance with Section 13(c) of the Federal Transit Act during the conversion of employees to MTS. The following section discusses these implications and is followed by Section 3.6, which documents the other key labor-related area requiring close consideration – collective bargaining processes and agreements.

3.5.1 RISK MANAGEMENT

The MTS Risk Management department oversees all activities related to protecting MTS from claims and liabilities. Insourcing Transdev fixed route and/or paratransit operations will require expansion of current activities potentially over doubling of current exposure in terms of facilities, vehicles, and service delivery.

Table 3-8: Risk Management Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Integration with MTS Risk Management Systems and Processes	• MTS will need to reconcile Transdev's Risk Management with its internal risk management systems to ensure protection for the expanded operation of up to three divisions, associated revenue and non-revenue services, and a much larger ridership base. CPD and its unique Paratransit operation will need special transitioning.			No Change
Staffing (Budgeted Positions)	• Additional MTS staff will be required to manage and deliver a risk management program that will over double in size for bus. While there will be some expected economies of scale, an increase of as many 3.5 FTEs in Scenario 1 is anticipated. +2.0 FTEs are projected for Scenario 2 and +1.5 in Scenario 3.			No Change

Claims & Liabilities

Current MTS coverage will need to expand to cover insourced activities under the various scenarios up to over doubling current MTS exposure. Activities and challenges are addressed below in three major groupings: workers' compensation, third-party liability, and asset protection.

Table 3-9: Claims & Liabilities Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Workers' Compensation Claims	• MTS, and its subsidiary corporations, are self-insured for Workers' Compensation claims. • MTS will likely need to either increase its self-insured retention (SIR) or obtain additional commercial coverage to manage the increased exposure to Workers' Compensation claims associated with a larger workforce. • The increase in budgeted positions in Scenario 3 (only insourcing Paratransit) would be more modest (an estimated +259.5 FTEs) and would not require as much additional (self-)insurance coverage as Scenarios 1 or 2, which will add more than 1,400 FTEs to MTS payroll.			No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Third-Party Liability Claims	• MTS and Transdev currently manage any third-party exposure, including passenger liability claims separately. (i.e., Transdev responds to and pays for any claims that arise on or from the vehicles they operate.) • MTS will need to assume this responsibility for any and all services that are insourced. This will likely require MTS to increase its SIR for third-party claims or obtain additional commercial insurance coverage for the increased exposure to third-party liability claims. Note that MTS has no history of working with Paratransit which has a different exposure to claims than regular fixed-route service (Scenarios 1 and 3).			No Change
Asset Insurance/Warranty Claims	• Transdev's Maintenance Department currently handles all insurance or warranty claims for MTS revenue fleet and major equipment assets that they operate. • MTS will need to take over this responsibility for the entire fixed route and/or Paratransit fleet, depending on the scenario, in line with their current Maintenance Department Practices. • Around 76% of MTS' total revenue fleet is comprised of vehicles from Gillig or New Flyer. MTS employees already maintain and handle warranty claims with these two original equipment manufacturers (OEM). • While many of the other vehicles from different OEMs (MCI, Starcraft, and El Dorado) are no longer under warranty, MTS does not currently maintain these makes of buses in-house and will need to establish processes and points of contact for interaction with these other three OEMs (where applicable in each scenario).			No Change

3.5.2 FEDERAL PUBLIC TRANSPORTATION PROTECTIONS

Section 13(c) of the Federal Transit Act underlies nearly all the labor and employment decisions that may need to be made in the event MTS decides to insource services currently provided by Transdev under the first three insourcing scenarios. As a reminder, Section 13(c) requires transit agencies that receive federal assistance or funding to enter into protective arrangements that cover the following six areas:

1. The preservation of rights, privileges and benefits under existing collective bargaining agreements;
2. The continuation of collective bargaining rights;
3. The protection of individual employees against a worsening of their pensions related to employment;

4. Assurances of continued employment to employees of acquired public transportation systems;
5. Assurances of priority of employment of employees whose employment is ended or who are laid off; and
6. Paid training or retraining.

While the risks of impacting a protected area may be low when insourcing, given that MTS currently provides its employees with arguably higher wages and benefits, these obligations still must be kept in mind when making any insourcing decisions.

In this regard, the continuation of collective bargaining rights and the preservation of the rights, privileges, and benefits in the existing Transdev collective bargaining agreements are outlined in detail in Section 3.6 below. At a minimum, however, MTS should be prepared to provide Transdev employees impacted by insourcing with assurances of continued employment at MTS.

3.6 Labor/CBAs

Across the MTS organization and Transdev's San Diego operation, unionized employees are represented by four locals of three separate unions under nine different collective bargaining agreements (CBA). These three unions and four locals are the Amalgamated Transit Union (ATU) Local 1309, the International Brotherhood of Electrical Workers (IBEW) Local 465, and Teamsters Locals 542 and 683. (MTS-employed operations department supervisors and dispatchers are non-represented.) A breakdown of the union locals and bargaining units at each division is shown in *Table 3-10*. As discussed in this study's Existing Conditions report, wages, employment terms, and benefits vary among these units, even for employees in the same job title at different divisions (in the case of Transdev). The following section provides an overview of key insourcing considerations as they relate to the collective bargaining process, agreements, and represented units.

Table 3-10: Union Representation by Division and Job Classification

Org.	Division	Union (& Local)	Bargaining Unit	Term of CBA/MOU
MTS	IAD/KMD	ATU (Local 1309)	Operators, Dispatchers, Clerks, Student Operators, Part-Time Operators, and Information Clerks	1/1/2025 – 12/31/2027[3]
		IBEW (Local 465)	Maintenance Employees	1/1/2025 – 12/31/2027[3]
		Not Represented	Supervisors	--

[3] New contracts ratified by MTS Board in December 2024.

Org.	Division	Union (& Local)	Bargaining Unit	Term of CBA/MOU
Transdev	South Bay	ATU (Local 1309)	Road Supervisors and Non-Supervisory Dispatchers	7/1/2023 - 6/30/2026
		Teamsters (Local 683)	Operators	1/1/2023 - 12/31/2025
			Mechanics and Service Workers	1/1/2024 - 10/31/2026
	East County	ATU (Local 1309)	Operators	7/1/2023 - 6/30/2026
		Teamsters (Local 683)	Mechanics and Service Workers	7/1/2022 - 6/30/2025
			Road Supervisors and Dispatchers	6/1/2024 - 5/31/2027
	Copley Park	ATU (Local 1309)	Dispatchers, Schedulers, Office Clerks, and Road Supervisors	5/21/2021 - 5/20/2025
		Teamsters (Local 542)	Drivers, Technicians (Maintenance), Utility Workers, and Reservationists	6/26/2023 - 3/31/2026

3.6.1 COLLECTIVE BARGAINING PROCESS

This section provides an overview of the impacts insourcing would have on the collective bargaining process, and the options MTS has for this relative to existing agreements and relevant state or federal statutes and regulations. In general, MTS has two options:

- **Alternative 1:** Insourced employees are brought into the existing bargaining units for represented MTS employees, whether immediately or following a transition period.

- **Alternative 2:** Maintain existing collective bargaining unit structure permanently for all represented employees of insourced services. MTS would negotiate updated contracts and/or bridge agreements with each union local. Future employees would join the union locals in the existing bargaining unit relative to their title and assigned work location.

Both Section 13(c) and MTS's enabling statute (Public Utilities Code sections 120300-120509) will require that MTS honor any insourced employees' collective bargaining rights, which effectively means, unless a classification is absorbed into an existing MTS bargaining unit, insourced classifications will continue to be represented by their respective unions. **MTS will need to decide whether to (1) accrete (or add) insourced classifications to one of its existing bargaining units or (2) maintain the Transdev bargaining unit and recognize the existing union as the exclusive representative of that unit.**

The ability to include insourced classifications in existing MTS bargaining units will largely depend upon whether that position, or a similarly situated one, is already represented in an MTS bargaining unit. For example, it may be appropriate to include fixed route bus operators

working in the South Bay and East County divisions in the same bargaining unit as MTS operators working out of IAD and KMD, to the extent that they perform essentially the same or similar duties. Even in those situations where there is no counterpart for the classification already represented in an MTS bargaining unit, MTS may be able to accrete or add the position into the MTS unit if that classification shares a sufficient community of interest with the MTS unit. A community of interest may include similar duties, supervision, training and licensing requirements, hours and schedules, and other terms and conditions of employment.

Accretion, or Alternative 1, may facilitate the integration of MTS and Transdev employees in the same classification, regardless of where they work, potentially allowing for the transfer of employees between divisions (i.e., feasibility and permissibility of system picks – the opportunity to move between divisions) and additional promotional opportunities. Further, fewer bargaining units would allow for greater uniformity of wages, hours, and other terms and conditions of employment. For example, an operator in the South Bay division would enjoy the same working conditions as operators in East County or the current MTS divisions. Accretion also simplifies labor relations and administration of represented employee matters in the long term. Fewer bargaining units means fewer CBAs and fewer parties with which to negotiate. A significant disadvantage would be potential challenges to accretion from any union that lost its status as the exclusive representative of a bargaining unit that it currently represents. This could extend the insourcing transition period significantly.

If MTS does not, or cannot, pursue Alternative 1, the other option is to preserve the existing collective bargaining unit structure in parallel with the other existing MTS bargaining units and their differing representation. An advantage is that this could more easily facilitate a longer transition period for wage, benefit, and work rule parity. A disadvantage to this alternative would be the need to negotiate separate labor agreements based on the division, despite the fact that all other duties in a particular classification remain the same.

Table 3-11 summarizes the potential options for determining the appropriate bargaining units under each insourcing scenario.

Table 3-11: Transdev Bargaining Unit Insourcing Considerations

Location	Transdev Bargaining Unit	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
South Bay Division	**Road Supervisors & Non-Supervisory Dispatchers** (ATU Local 1309)	• Recognize ATU as representative of existing unit, or only as the representative of Road Supervisors while adding Dispatchers to MTS unit. • Consider creating MTS-wide Road Supervisor Unit.		No Change	No Change
	Operators (Teamsters Local 683)	• Recognize Teamsters as representative of existing unit or add Operators to MTS unit.		No Change	No Change

Location	Transdev Bargaining Unit	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
	Mechanics & Service Workers (Teamsters Local 683)	• Recognize Teamsters as representative of existing unit or add Mechanics to MTS Maintenance unit.		No Change	No Change
East County Division	**Operators** (ATU Local 1309)	• Recognize ATU as representative of existing unit or add Operators to MTS unit.		No Change	No Change
	Mechanics & Service Workers (Teamsters Local 683)	• Recognize Teamsters as representative of existing unit or add Mechanics to MTS Maintenance unit.		No Change	No Change
	Road Supervisors and Dispatchers (Teamsters Local 683)	• Recognize Teamsters as representative of existing unit, or only as the representative of Road Supervisors while adding Dispatchers to MTS unit. • Consider creating MTS-wide Road Supervisor Unit.		No Change	No Change
Copley Park Division	**Dispatchers, Schedulers, Office Clerks, & Road Supervisors** (ATU Local 1309)	• Recognize ATU as representative of existing unit. • Combine in whole or in part with MTS unit to the extent they share a sufficient community of interest.	No Change	• Recognize ATU as representative of existing unit. • Combine in whole or in part with MTS unit to the extent they share a sufficient community of interest.	No Change
	Drivers, Technicians (Maintenance), Utility Workers, & Reservationists (Teamsters Local 542)	• Recognize Teamsters as representative of existing unit. • Combine in whole or in part with MTS unit to the extent they share a sufficient community of interest.	No Change	• Recognize Teamsters as representative of existing unit. • Combine in whole or in part with MTS unit to the extent they share a sufficient community of interest.	No Change

Terms and Conditions of Employment

This section summarizes the various decisions that may be necessary with respect to wages and terms and conditions of employment under the four insourcing scenarios. As with other labor and employment decisions, an underlying principle here is compliance with Section 13(c) of the Federal Transit Act in preserving the rights, privileges, and benefits of Transdev employees, as set forth in their current collective bargaining agreements.

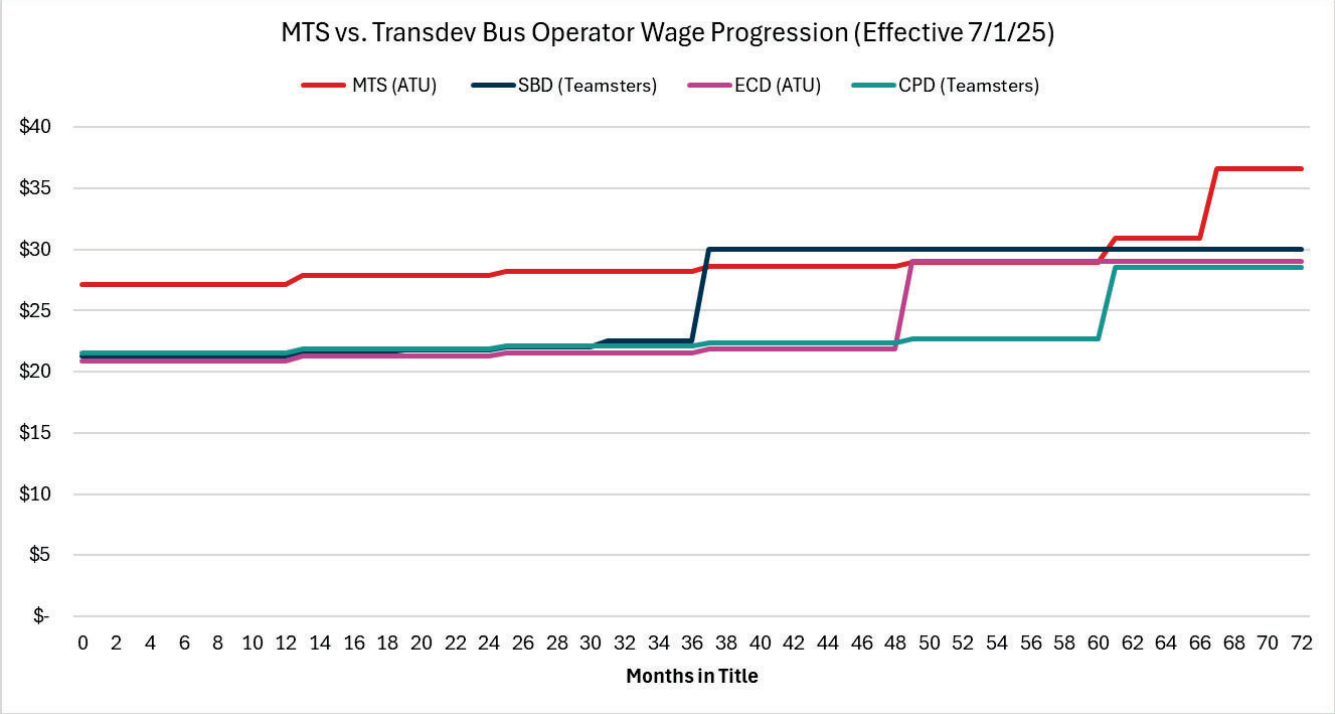
To the extent that Transdev classifications are accreted into an existing MTS bargaining unit, the wages and terms and conditions of employment will largely be governed by the provisions in the existing MTS collective bargaining agreements.

In those cases where Transdev classifications are included in a unit that is different than an existing MTS unit, MTS may unilaterally determine the initial terms and conditions of employment, so long as they are not lower overall than what the impacted employees enjoyed when employed by Transdev. However, there will still be an obligation to bargain in good faith with those units' respective representatives over potential changes to the initial terms and conditions of employment. *Table 3-12* summarizes the potential decisions regarding terms and conditions of employment that may need to be made under the various insourcing scenarios. Additional details about some of the more significant terms are as follows:

Wages. The initial wage rate for represented insourced employees should be no less than what they earned as a Transdev employee. If a classification is accreted or added to an existing MTS bargaining unit, then the insourced employee should be placed at the appropriate point in that classification's MTS pay range. The current (as of 7/1/2025) wage progression for MTS bus operators vs. SBD, ECD, or CPD Transdev drivers is shown in *Figure 3-1*. Operators from all three of the Transdev divisions initially make at least $5.63 less per hour than MTS operators. SBD operators reach parity with MTS drivers (and slightly exceed their hourly rate) after three years in the job classification. ECD operator wages increase a year later, after four years in title, to align with MTS and SBD. However, this is the last progression for SBD and ECD drivers, whose base wages once again fall below those of MTS operators after the latter's final step after five and a half years in title. CPD operator wages remain consistently below those of MTS throughout the progression and fall behind the other Transdev divisions after three to four years in title.[4]

[4] However, it is important to note that the operator job qualifications, responsibilities, and training differ between CPD's Paratransit/Minibus operators and the rest of Transdev's operators or MTS's fixed route operators. CPD operators are only required to hold a Class C CDL, versus a Class B CDL for MTS or Transdev fixed route operators driving a larger transit bus. Additionally, CPD operators only go through 80 hours of training versus 180 hours (4.5 weeks) for Transdev fixed route operators and 360 hours (9 weeks) for MTS operators.

Figure 3-1: Bus Operator Wage Progression, MTS vs. Transdev



Seniority. Seniority has been typically determined by classification in both the MTS and Transdev bargaining units. If a classification is accreted or added to an existing MTS bargaining unit, then any integration of the seniority lists will be subject to negotiations with the union representing that unit. (The likely issue in such negotiations will be whether to recognize the Transdev employees' prior length of employment or to place them at the bottom of the seniority list, behind all existing MTS employees in that classification.) If a separate Transdev bargaining unit is maintained, then the prior seniority lists can be maintained.

Leaves (vacation, sick leave, etc.). For classifications that are accreted (i.e. added to an existing MTS bargaining unit), the existing MTS collective bargaining agreement will define the leave rights. If a separate Transdev bargaining unit is maintained, then the initial leave rights should be no less than what was enjoyed under the applicable Transdev collective bargaining agreement. If vacation is not cashed out

during any transition to MTS employment, MTS may consider rolling over the accrued vacation bank (subject to final financial adjustments between MTS and Transdev).

Holidays. The applicable MTS labor agreement will determine the holiday benefit for those employees added to an existing MTS bargaining unit. For other employees, the initial benefit should be no less than that provided in the respective Transdev agreement. However, for the sake of system-wide uniformity, MTS may consider providing an initial holiday benefit that is equal to that enjoyed by current MTS represented employees.

Overtime. As a public agency, MTS is only required to pay its employees overtime for hours worked in excess of 40 in a workweek. It does not have an obligation to pay daily overtime. To maintain system-wide uniformity, MTS should apply the same overtime rules to insourced employees. However, to the extent that an existing Transdev bargaining unit is maintained, overtime would eventually be subject to negotiation.

Probationary Period. MTS may consider applying its current 180-day probationary period across the board, with the possibility of exempting insourced employees from that probationary period.

Personnel Rules. To the extent a particular rule has not been expressly included or addressed in a collective bargaining agreement, MTS should consider applying its personnel rules across the board. However, to the extent that a former Transdev bargaining unit has been maintained, there may be an eventual obligation to bargain upon request of certain personnel rules.

Table 3-12: Represented Terms of Employment Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Wages	• Option 1: Initially use existing Transdev wage rates as a floor, subject to subsequent negotiation. • Option 2: Move Transdev employees to corresponding MTS wage range, with the placement in the range at a rate no less than the Transdev rate. • Option 3: Move some Transdev classifications to MTS wage range while maintaining existing Transdev wages for other classifications. (e.g., paratransit)	• Option 1: Initially use existing Transdev wage rates as a floor, subject to subsequent negotiation. • Option 2: Move Transdev employees to corresponding MTS wage range, with the placement in the range at a rate no less than the Transdev rate.	• Initially use existing Transdev wage ranges as a floor, subject to subsequent negotiation.	No Change
Seniority	• Integrate seniority lists, through collective bargaining. • Maintain separate seniority list if no change in bargaining unit.		• Maintain separate seniority list if no change in bargaining unit.	No Change
Sick Leave	• Subject to MTS collective bargaining agreement or, initially, no less generous than what was provided under the applicable Transdev labor agreement.		• Initially, no less generous than what was provided under the applicable Transdev labor agreement.	No Change
Bereavement/Paid Jury Duty	• Subject to MTS collective bargaining agreement or, initially, no less generous than what was provided under the applicable Transdev labor agreement.		• Initially, no less generous than what was provided under the applicable Transdev labor agreement.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Vacation	• Subject to MTS collective bargaining agreement or, initially, no less generous than what was provided under the applicable Transdev labor agreement. • Consider providing a credit for accrued PTO equal to the amount available from the contractor as of the transition date.		• Initially, no less generous than what was provided under the applicable Transdev labor agreement. • Consider providing a credit for accrued PTO equal to the amount available from the contractor as of the transition date.	No Change
Holidays	• Subject to MTS collective bargaining agreement or, initially, no less generous than what was provided under the applicable Transdev labor agreement. • Consider system-wide holiday uniformity in any subsequent CBA negotiations if there are separate bargaining units for the former contracted divisions.		• Initially, no less generous than what was provided under the applicable Transdev labor agreement. • Consider system-wide holiday uniformity in any subsequent CBA negotiations if there are separate bargaining units for the former contracted divisions.	No Change
Overtime	• Consider converting all employees to weekly overtime only, as part of CBA negotiations. • Maintain exemptions where appropriate.		• Consider converting all employees to weekly overtime only, as part of CBA negotiations.	No Change
Life Insurance/Death Benefit	• Consider system-wide uniformity by providing what is required under MTS agreements.			No Change
Uniforms	• Consider standardizing, with by providing uniforms or a uniform credit. The amount of any credit may vary depending upon the classification needs.			No Change
Trainer Pay	• Consider across the board uniformity, for those positions where it is applicable.		• Determine if appropriate for paratransit classifications.	No Change
Transit Pass	• Provide the same transit pass benefits currently available to MTS in-house operations staff.			No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Part Time (Operators only)	• Consider standardizing, especially if operators are to be included in the MTS unit.		• Determine if appropriate for paratransit classifications.	No Change
Tool Allowance (Mechanics and Maintenance only)	• Consider standardizing, unless paratransit mechanics are to be included in a separate unit and have different tool needs.	• Consider Standardizing.	• Standardize unless paratransit mechanics have different needs.	No Change
Probationary Period	• Consider system-wide uniformity of 180 days. • Consider exempting insourced employees from probationary period.			No Change
Guaranteed Hours	• Consider standardizing, depending on the classification needs, as part of future CBA negotiations.			No Change
Personnel Rules	• System-wide uniformity, subject to potential negotiations.			No Change

Retirement Plans

MTS employees represented by ATU Local 1309 who were hired on or before November 1, 2012, are covered by a 2% at 55 defined benefit plan. ATU represented employees hired after November 1, 2012, are covered by a 401(a) defined contribution plan in which MTS currently contributes 6% of straight time wages and matches 100% of the first 2% of wages contributed by the employee. These employees are not covered by any contract for retirement benefits between MTS and the California Public Employees' Retirement System (CalPERS).

MTS employees represented by IBEW Local 465 (Maintenance Department) who were hired on or before April 28, 2011, are covered by a similar 2% at 55 defined benefit plan.[5] And employees hired after April 28, 2011, are likewise covered by a similar 401(a) defined contribution plan. The employees are also not covered by any contract for retirement benefits between MTS and CalPERS.

For retirement plan purposes, all insourced non-represented individuals will be considered new MTS employees and should be subject to the existing 401(a) defined contribution plan(s). Prior to any insourcing, MTS should review its plan(s) in order to determine whether any amendments or changes are necessary in order to accommodate all new employee classifications.

[5] One difference between the two MTS defined benefit plans is that the ATU plan caps benefits at 60%, while the IBEW plan caps benefits at 70%.

Disciplinary and Appeals Process

MTS employees are public employees with a property interest in their positions and can only be released for just cause after appropriate due process has been provided. Probationary employees, however, may be released without cause. Discipline may be appealed through the grievance and arbitration procedure, which results in binding arbitration for both labor agreements. For bus operators, an accident appeals committee and procedure exists to determine the preventability of accidents.

Because Transdev employees were not considered "at will" and could only be disciplined for cause, they should be afforded the same due process rights as other MTS employees *following any potential probationary periods*. For those Transdev classifications that are accreted or added to an existing MTS bargaining unit, MTS's personnel rules as well as the applicable collective bargaining agreement will govern the disciplinary appeals process. For those who are placed in a separate or new bargaining unit, MTS's personnel rules will govern the process until a new collective bargaining agreement can be finalized to cover that unit.

3.7 Human Resources and Training

This section provides an overview of the potential insourcing impacts and challenges for the Human Resources (HR) department as well as the bus operations and bus maintenance training.

3.7.1 HUMAN RESOURCES

MTS and Transdev maintain wholly separate HR departments with no resources or functions shared between them. With parallel HR operations in place currently, Transdev's local HR functions and positions would most likely not be insourced into the MTS organization. *Table 3-13* details how recruitment efforts will be consolidated based on MTS policies and how to approach insourcing current Transdev employees. In general, the recruitment efforts will be adjusted to align with internal MTS processes and depend on CBA negotiations. The biggest impact to the MTS HR department will be the need for additional staff to manage the recruitment, hiring, and support of a much larger workforce under Scenarios 1 and 2 and to a lesser degree Scenario 3. Above this new baseline workload, there will be additional responsibilities during an insourcing transition period in which the MTS HR Department will need to confirm the qualifications and hiring suitability for all converted Transdev employees and manage their onboarding to the MTS organization. It is also important to note that there are differences in the stated hiring qualifications for bus operators between MTS and Transdev. (See the subsection below.)

Table 3-13: Human Resources Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Recruitment for Bus Operations	• Consolidate fixed route and paratransit recruitment efforts across all five divisions.	• Consolidate fixed route (including Minibus) recruitment efforts across four divisions.	• Consolidate paratransit operator recruitment into existing MTS hiring.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
	• This will depend on the outcome of the CBA negotiations and consolidations process.	• This will depend on the outcome of the CBA negotiations and consolidations process.	• This will depend on the outcome of the CBA negotiations.	
Recruitment for Bus Maintenance	• Consolidate fixed route and paratransit recruitment efforts across all five divisions. • This will depend on the outcome of the CBA negotiations and consolidations process.	• Consolidate fixed route (including Minibus) recruitment efforts across four divisions. • This will depend on the outcome of the CBA negotiations and consolidations process.	• Consolidate paratransit maintenance recruitment into existing MTS hiring. • This will depend on the outcome of the CBA negotiations.	No Change
Recruitment for Other Departments	• Consolidate recruitment efforts into existing MTS processes.			No Change
New Hire Qualifications	• Ensure stated qualifications for all positions formerly staffed by Transdev align with MTS policies.			No Change
Transdev Employee Conversion	• Conduct MTS-standard pre-hire qualifications review and background checks for all current Transdev employees eligible for insourcing conversion. • This will require new-hire requirements for any positions unfilled by insourcing. • This will incur significant staff time within the MTS HR department. • All employee conversion screening should be scheduled and structured to mitigate impact to daily service delivery.			No Change
Retirement Plan Resolution	• Resolve differences in retirement plan structures and benefits for insourced employees.			No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing (Budgeted Positions)	• Additional staffing in department supervision/ management is not anticipated. • Additional FTEs needed in these titles: Benefits & Comp Analyst (+3), Human Resources Assistant (+1), Human Resources Specialist (+1), Leadership Development Specialist (+1) and Talent Acquisition Specialist (+2). • Additionally, two new positions would need to be created with one FTE each, Labor Relations Analyst and Labor Relations Specialist, if existing Transdev bargaining units are brought over to MTS.	• Additional staffing in department supervision/ management is not anticipated. • Additional FTEs needed in these titles: Benefits & Comp Analyst (+3), Human Resources Assistant (+1), Human Resources Specialist (+1), Leadership Development Specialist (+1) and Talent Acquisition Specialist (+2). • Additionally, two new positions would need to be created with one FTE each, Labor Relations Analyst and Labor Relations Specialist, if existing Transdev bargaining units are brought over to MTS.	• Additional staffing in department supervision/ management is not anticipated. • Additional FTEs needed in these titles: Benefits & Comp Analyst (+1), Human Resources Specialist (+1), and Talent Acquisition Specialist (+1). • Additionally, two new positions would need to be created with one FTE each, Labor Relations Analyst and Labor Relations Specialist, if existing Transdev bargaining units are brought over to MTS.	

Bus Operator Qualifications

The hiring qualifications for bus operators are generally similar between MTS and Transdev, with a few key differences as shown in *Table 3-14* . The MTS HR Department will need to establish a process for reviewing the qualifications of all Transdev bus operators prior to an employment offer to ensure that they meet MTS requirements and expectations. The key differences between the job postings include:

- MTS requires that operator candidates have a high school diploma or GED, while Transdev has no educational requirement.
- While the listed physical requirements are similar between MTS and Transdev's fixed route operation (SBD and ECD), there are no stated physical requirements for Minibus and Paratransit operators at CPD.

- MTS requires that operator applicants hold a valid California driver's license at the time of application and produce a three-year driving record report (CA DMV K-4 Report). Transdev does not state either of these requirements.
- MTS insists upon a clean driving record and the text of the job posting gives the employer latitude for interpretation, stating, "No applicant will be considered whose traffic record reflects irresponsibility or disregard of traffic rules and laws." Transdev's job posting makes no mention of applicants' past driving record or behavior behind the wheel.
- Both employers requiring operators have three or more years of driving experience. MTS does not provide any more detail, while Transdev qualifies that this experience can be "personal or professional."
- Both MTS and Transdev's fixed route operation (SBD and ECD) require that applicants be able to obtain and maintain a Class B commercial driver's license (CDL), but the CPD job posting makes no mention of driver's licenses. While the Minibus and Paratransit fleet is smaller than the fixed route transit bus fleet and does not require a Class B license to operate, these operators will still need to obtain a Class C CDL with Passenger Vehicle (PV) endorsement.
- The MTS job posting includes a number of additional behavioral, intellectual, and attitudinal requirements or expectations related to on-the-job performance (e.g., the ability to read, write, and communicate clearly in English). Transdev's job postings (separated by division), merely state that candidates should have "excellent communication & customer service skills."

Table 3-14: Bus Operator Hiring Qualifications – MTS vs. Transdev

Qualification	MTS	Transdev (SBD & ECD)	Transdev (CPD)
Age	• 21 years or older	• 21 years or older	
Education	• High School Diploma or GED	None	

Qualification	MTS	Transdev (SBD & ECD)	Transdev (CPD)
Physical Requirements/ Qualifications	• Able to fulfill the physical demands of the job such as walking, stooping, sitting, bending, reaching for overhead files and occasional lifting (must be able to lift up to 50 pounds). • Must be able to operate a motor vehicle and perform tasks involving manual dexterity, such as use of a computer and 10-key. • Work will at times require more than 8 hours per day or an irregular work week to perform the essential duties of the position. • Must have good eyesight and the ability to maintain constant alertness under tedious circumstances. • Candidates should demonstrate stable employment, punctuality, good attendance records and a favorable attitude toward public service. • Candidates must demonstrate ability to communicate effectively, both orally and in writing.	• Excellent communication & customer service skills. • Availability to work day, evening, weekend and overnight shifts as assigned. • Must be able to work shifts or flexible work schedules as needed. • Sit for extended periods of time. • Drive in traffic and in all weather conditions. • Lift, push, pull, and carry tools, objects, or equipment above shoulder level without assistance. • Move up and down stairs easily. • Reach overhead and below the knees, including bending, twisting, pulling, and stooping. • Work environment will be a combination of both indoors and outdoors.	• Excellent communication & customer service skills. • Availability to work day, evening, weekend and overnight shifts as assigned.
Driver's License/Record	• Valid CA driver's license at time of application (Noncommercial Class C or above) • K-4 DMV Record (3-year report) at time of application • Ability to obtain and maintain a valid CA Class B license • "No applicant will be considered whose traffic record reflects irresponsibility or disregard of traffic rules and laws"	• Able to obtain and maintain a CDL Class B with passenger and airbrake endorsement	None
Driving Experience	• 3+ Years	• 3+ Years ("personal or professional")	

Qualification	MTS	Transdev (SBD & ECD)	Transdev (CPD)
Pre-Employment Screening	• Must satisfactorily pass all applicable examinations including, but not limited to, a pre-employment physical, drug screen and background check.	• Subject to a DOT drug testing and physical if applicable. DOT Regulation 49 CFR Part 40 does not authorize the use of Schedule I drugs, including cannabis, for any reason. • If based in the United States, applicants must be eligible to work in U.S. without restrictions for any employer at any time; be able to pass a drug screen and background check.	
Additional Skills/Other Qualifications	• Knowledge of or ability to learn MTS policies and regulations. • Ability to read, understand and apply MTS policies, regulations and union labor contracts. • Ability to write letters, memoranda and reports using clear, concise and grammatically correct English. • Ability to speak clearly, distinctly and effectively in person-to-person or small group situations using tact and diplomacy. • Ability to coordinate and initiate actions necessary to implement decisions and delegate responsibilities to appropriate personnel. • Ability to establish and maintain priorities in order to complete assignments by deadlines without detailed instructions. • Strong organizational skills and demonstrated ability to multi-task and follow a set time schedule. • Ability to exercise prudent and timely judgment in normal and emergency situations. • Ability to sit for long periods of time in a confined area. • Excellent customer service skills. • Ability to get along with others. • Demonstrated solid work ethic and punctuality; knowledge of and ability to properly adhere to safety procedures. • Must have a flexible schedule and be available to work on days, nights, weekends and holidays.	None	

3.7.2 TRAINING

As with HR, MTS and Transdev maintain entirely separate functions for bus operator and mechanic training. This section details the insourcing impacts for the MTS Operations Training and Maintenance Training programs. The biggest impact for Operations Training is the need for additional training staff to accommodate more than twice as many students being trained on a regular basis with MTS operating one to three additional divisions (depending on scenario). MTS Operations Training may need to have further additional staffing in place at the outset of an insourcing transition period to accommodate the additional workload for any skills testing, refresher training, or remedial training needed for converted Transdev operators. There is likely to be less of a personnel impact for Maintenance Training, which is primarily conducted through the MTS apprenticeship program with the San Diego Community College District. However, the biggest insourcing challenge for Maintenance Training relates to collective bargaining and the current contractual requirement that all MTS mechanics complete the apprenticeship program. It would not be feasible to require all converted Transdev mechanics to complete the multi-year MTS apprenticeship program prior to becoming MTS employees and a solution will need to be identified through the collective bargaining process depending on whether the mechanics and servicers are accreted or the existing represented units are maintained.

Operations Training

Table 3-15 summarizes the key insourcing considerations for Operations Training. More MTS training staff would be needed to meet the increased training requirements, depending on scenario. In Scenarios 1 and 3, MTS would need to establish a new training curriculum for Paratransit operators. As noted above, MTS will also need to establish a protocol and have adequate staffing resources in place for any skills testing, refresher training, or remedial training needed for converted Transdev operators. Additionally, all MTS bus operators are currently trained for all 26 MTS-operated routes. This practice would not be feasible with insourcing given the growth to 100 systemwide routes with the addition of 60 insourced fixed routes and 14 insourced minibus routes and much larger service area. MTS staff indicated that bus operator training could be centralized and uniform at the beginning of training, but trainees would need to be assigned to a division to learn that garage's routes.

Table 3-15: Operations Training Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Curriculum and Structure	• Need to account for additional initial training duration for SBD/ECD operators in crewing and service planning. • Need to account for additional operators in refresher training. • Need to establish MTS-sanctioned training for minibus and Paratransit positions. • Given the size of the MTS system and service area, operators will need to be assigned to a division for route training and learn that division's route. This will add additional complexity for division picks.	• All Scenario 1 elements apply, except for Paratransit. • Need incorporate fleet-specific training for Minibus	• Need to establish MTS-sanctioned training program for Paratransit (operations, vehicles, customer service, etc.)	No Change
Staffing (Budgeted Positions)	• 11 additional FTEs needed for increased training capacity requirement and duration, and for new paratransit training program.	• 9 additional FTEs needed for increased training capacity requirement and duration	• 4 additional FTEs needed for new paratransit training program.	No Change
CBA Implications	• Bring Transdev CBA language into compliance with MTS training requirements	• Bring minibus training into compliance with MTS training requirements	• Bring paratransit training into compliance with MTS training requirements	No Change

Maintenance Training

Table 3-16 below identifies key insourcing considerations for Maintenance Training. As discussed previously, the most notable insourcing challenge for this department is the requirement, in MTS's CBA with IBEW for the Maintenance Department bargaining unit, that all mechanics complete the MTS apprenticeship program. There are broader collective bargaining challenges for Maintenance, as with Operations, in terms of resolving the insourced bargaining units' representation, but this training and apprenticeship question will need to be resolved as part of that.

Table 3-16: Maintenance Training Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Apprenticeship Program	• MTS will need to work with its partners at the San Diego Community College District to expand the size of the apprenticeship program for staffing new mechanic hires at the additional division(s), depending on the scenario. • Scenario 3 may not require a program expansion, but the insourcing of SBD, ECD, and part or all of CPD in Scenarios 1 and 2 almost certainly will.			No Change
Staffing (Budgeted Positions)	• 4 additional FTEs would be needed in the Bus Maintenance Trainer position for on-the-job training requirements, assessments, and other needs.	• 3 additional FTEs would be needed in the Bus Maintenance Trainer position for on-the-job training requirements, assessments, and other needs.	• 1 additional FTE would be needed in the Bus Maintenance Trainer position for on-the-job training requirements, assessments, and other needs.	No Change
CBA Implications	• MTS Maintenance employees are exclusively represented by IBEW, whose CBA requires that mechanics complete the apprenticeship program. • Depending on the outcome of the CBA and representation negotiations (and the chosen scenario), MTS will need to determine how to insource existing Transdev mechanics without requiring them to complete the multi-year apprenticeship program before becoming MTS employees in a mechanic title.			No Change

3.8 Operations

Under the current operational structure, MTS seeks to deliver a seamless transit service for the customer with no differentiation between MTS and outsourced services. With insourcing, MTS will need to ensure that daily operational practices and scheduling efforts align with MTS standards and practices and any insourced divisions operate the same as IAD or KMD.

3.8.1 SERVICE DELIVERY

Table 3-17 below highlights the key considerations or challenges for daily operations and service delivery associated with the insourcing scenarios. The primary and most significant change will be the additional staffing need for operators, supervision, dispatch, and division management based on MTS best practice. Beyond that, MTS will need to ensure that the insourced division(s) are following all MTS SOPs and any other service delivery protocols.

Table 3-17: Operations Management Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Policies, Procedures, and Practices	• Ensure that insourced divisions all follow MTS SOPs for service delivery; training in MTS policies, procedures, and technology will be needed.	• Ensure that insourced divisions all follow MTS SOPs for service delivery; training in MTS policies, procedures, and technology will be needed.	• Ensure that insourced CPD follows MTS SOPs for service delivery; training in MTS policies, procedures, and technology will be needed.	No change
Division Management Staffing	• MTS will need to hire Division Managers for Transportation at SBD, ECD, and CPD	• MTS will need to hire Division Managers for Transportation at SBD and ECD	• MTS will need to hire a Division Manager for Transportation at CPD	No Change
Dispatching - Control Center	• MTS to assume service monitoring of all former Transdev services. Staffing change +5.	• MTS to assume service monitoring of former Transdev fixed route and minibus services. Staffing change +5.	• MTS to assume radio dispatching for Paratransit at CPD. No anticipated staffing change, because CPD has dispatchers in dual roles (division and radio). See below.	No change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Dispatching - Divisions	• MTS to assume division dispatching for insourced divisions (SBD, ECD, CPD). Staffing change +18.	• MTS to assume division dispatching for insourced divisions (SBD, ECD). Staffing change +12.	• MTS to assume division dispatching for insourced division (CPD). Staffing change +6.	No Change
Road Supervision	• MTS to assume division field supervision for insourced divisions (SBD, ECD, CPD). Staffing change +39.	• MTS to assume division field supervision for insourced divisions (SBD, ECD). Staffing change +33.	• MTS to assume division field supervision for insourced divisions (CPD). Staffing change +7.	No Change

3.8.2 SCHEDULING/CREWING

Table 3-18 outlines likely changes to scheduling, operator crewing and work picking procedures. Insourcing fixed route services will require additional effort from MTS staff with runcutting. Insourcing Paratransit services will require that MTS take on those scheduling duties currently handled by Transdev. The outcome of the collective bargaining process and manner in which Transdev operators are insourced will determine future work selection rules and practices. (E.g., if MTS maintains the existing Transdev bargaining unit structure and representation, division changes during picks/shakeups would have different work rules for IAD/KMD versus SDD/ECD/CPD.)

Table 3-18: Scheduling/Crewing Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing (Budgeted Positions)	• It is anticipated that MTS will need to add one additional scheduler to produce fixed route runcuts for the insourced divisions, and one additional scheduler for Paratransit at CPD.	• It is anticipated that MTS will need to add one additional scheduler to produce the runcuts for the insourced fixed route divisions and minibus.	• It is anticipated that MTS will need to add one additional scheduler for Paratransit at CPD.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
	• MTS currently has two scheduler FTEs, overseen by a manager, who manage all fixed route timetabling and blocking for the entire system and crew scheduling for IAD/KMD.			
Timetable/Trip and Vehicle Scheduling	• MTS currently conducts all fixed route timetabling and vehicle blocking (scheduling) in HASTUS, including for Transdev-operated fixed route services. • Paratransit service scheduling will shift to MTS and continue using same processes and technology as currently used by Transdev.	• No change. MTS currently conducts all fixed route timetabling and vehicle blocking (scheduling) in HASTUS, including for Transdev-operated fixed route services.	• Paratransit service scheduling will shift to MTS and continue using same processes and technology as currently used by Transdev.	No Change
Runcutting (Crew Scheduling)	• Transition all operator runcutting to MTS's HASTUS system for the insourced fixed route and Minibus operations. • Paratransit runcutting will shift to MTS and continue using same processes and technology as currently used by Transdev.	• Transition all operator runcutting to MTS's HASTUS system for the insourced fixed route and Minibus operations.	• Paratransit runcutting will shift to MTS and continue using same processes and technology as currently used by Transdev.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Shakeups (Represented Employee Work Picking)	• Establish MTS picking process for former Transdev employees. • Process and structure for Division shakeups will depend on outcome of future CBA negotiations.	• Establish MTS picking process for former Transdev fixed route and Minibus employees. • Process and structure for Division shakeups will depend on outcome of future CBA negotiations.	• Establish MTS picking process for former Transdev Paratransit employees. • Process and structure for Division shakeups will depend on outcome of future CBA negotiations.	No Change

3.9 Maintenance

This section discusses the four areas of maintenance that are critical to MTS's operations and will be impacted by insourcing. This includes revenue fleet maintenance, daily fleet servicing, operating facility maintenance, and passenger facilities maintenance.

3.9.1 REVENUE FLEET MAINTENANCE

This subsection covers the planned and unplanned revenue fleet maintenance functions, independent of daily servicing. As with other divisional-level functions, the most significant impact will be a major increase to budgeted staffing levels. An analysis of the ratio of scheduled division-level weekly revenue miles to budgeted MTS mechanics and incumbent Transdev mechanics found that Transdev has a leaner mechanic staffing level than MTS (1.75 times as many revenue miles per mechanic at SBD and ECD than MTS and nearly 2 times as many at CPD). The project team developed the projected mechanic headcount requirements for the insourced divisions around the current MTS staffing ratios.

Table 3-19: Revenue Fleet Maintenance Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Vehicle Maintenance	• MTS audits and periodically inspects the Transdev-operated fleet to assure that conformance with proper maintenance is being provided. • The expectation is that no remedial state of good repair maintenance will be required. • Insourcing would only require that the maintenance of these vehicles be transferred to MTS.	• MTS audits and periodically inspects the Transdev-operated fixed route and Minibus fleet to assure that conformance with proper maintenance is being provided. • The expectation is that no remedial state of good repair maintenance will be required. • Insourcing would only require that the maintenance of these fixed route vehicles be transferred to MTS.	• MTS audits and periodically inspects the Transdev-operated paratransit fleet to assure that conformance with proper maintenance is being provided. • The expectation is that no remedial state of good repair maintenance will be required. • Insourcing would only require that the maintenance of these fixed route vehicles be transferred to MTS.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Farebox Equipment Maintenance	• MTS would replace probing and vault servicing activities currently performed by Transdev with MTS procedures and staffing levels.	• MTS would replace fixed route and minibus probing and vault servicing activities currently performed by Transdev with MTS procedures and staffing levels.	• MTS would replace paratransit fleet probing and vault servicing activities currently performed by Transdev with MTS procedures and staffing levels.	No Change
Vehicle Maintenance Staffing Levels	• MTS to assume all vehicle maintenance staffing and supervision for SBD, ECD, and CPD. • Staffing to follow current MTS ratios per revenue mile with staffing increase of 160 FTEs across the mechanic titles.	• MTS to assume all vehicle maintenance staffing and supervision for SBD, ECD, and minibus. • Staffing to follow current MTS ratios per revenue mile with staffing increase of 131 FTEs across the mechanic titles.	• MTS to assume all vehicle maintenance staffing and supervision for CPD paratransit. • Staffing to follow current MTS ratios per revenue mile with staffing increase of 28 FTEs across the mechanic titles.	

3.9.2 DAILY FLEET SERVICING

This subsection covers the daily revenue fleet servicing functions, independent of planned and unplanned maintenance tasks discussed in the preceding subsection. As with other divisional-level functions, the most significant impact will be a major increase to budgeted staffing levels. An analysis of the ratio of division-level revenue vehicle counts to budgeted MTS servicers and incumbent Transdev servicers ("Utility Worker" title) found that Transdev has a leaner servicer staffing level than MTS (1.5 times as many vehicles per servicer than MTS at SBD, 1.8 times at ECD and 2.8 times at CPD). The project team developed the projected servicer headcount requirements for the insourced divisions around the current MTS staffing ratios.

Table 3-20: Fare Collection Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Daily Fleet Servicing (Including vehicle cleaning, fueling/charging, and farebox servicing)	• MTS would replace fleet servicing activities currently performed by Transdev with MTS procedures.	• MTS would replace fleet servicing activities currently performed by Transdev with MTS procedures.	• MTS would replace fleet servicing activities currently performed by Transdev with MTS procedures.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Daily Fleet Servicing Staffing Levels	• MTS to assume all vehicle servicing staffing and supervision for SBD, ECD, and CPD. • Staffing to follow current MTS ratios per peak bus with staffing increase of 117 FTEs in Servicer A title.	• MTS to assume all vehicle servicing staffing and supervision for SBD, ECD, and minibus. • Staffing to follow current MTS ratios per peak bus with staffing increase of 88 FTEs in Servicer A title .	• MTS to assume all vehicle servicing staffing and supervision for CPD paratransit. • Staffing to follow current MTS ratios per peak bus with staffing increase of 29 FTEs in Servicer A title.	No Change

3.9.3 OPERATING FACILITY MAINTENANCE

This subsection covers the maintenance functions of MTS's Operating and Maintenance (O&M) facilities. Transdev is currently responsible for the routine maintenance of the three facilities out of which they operate.

Table 3-21: Operating Facility Maintenance Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Transition Process	• MTS should conduct a full audit of the facilities (SBD, ECD, CPD) to ensure state of good repair and contract compliance prior to operations handover. • Insourcing would require that day-to-day maintenance and repair be transferred to MTS. Specific responsibilities within Transdev managed and staffed facilities would need to be absorbed by MTS. This includes above-ground Diesel fuel tank monitoring, general CNG station monitoring, third party vehicle lift inspection contracts, Electric Charging stations monitoring, building and utility repairs and upkeep, yard and building cleaning, and landscaping services and maintaining LEED Certifications.	• MTS should conduct a full audit of the facilities (SBD, ECD) to ensure state of good repair (SGR) and contract compliance prior to operations handover. (CPD audit only if minibus stays at that facility.) • All discussions for Scenario 1 apply to Scenario 2 for SBD and ECD. • Insourcing implications for CPD depend on how paratransit and minibus services are disentangled and which service remains at CPD. • Most of the spare parts inventory Is purchased by Transdev and these would be purchased by MTS or removed by Transdev. MTS will need to conduct an audit to confirm parts inventory ownership, quality, quantity, and value.	• MTS should conduct a full audit of the CPD facility to ensure state of good repair and contract compliance prior to operations handover. • Decision will be needed for Minibus operating base – with Paratransit moving to MTS, Minibus operations will need to transfer to SBD and/or ECD. • No change for SBD or ECD • Most of the fleet and facilities spare parts inventory Is purchased by Transdev and these would be purchased by MTS or removed by Transdev. MTS will need to conduct an audit to confirm parts inventory ownership, quality, quantity, and value.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing	• MTS currently employs one Apprentice and one Mechanic A for each of its two divisions. • MTS will need to increase the budgeted count for these two facility-specific Maintenance positions. Some efficiency is expected with KMD and CPD's proximity to one another, with an anticipated need of 1 additional Apprentice, 8 additional Mechanic A FTEs and 2 additional Facilities Supervisors.	• MTS currently employs one Apprentice and one Mechanic A for each of its two divisions. • MTS will need to increase the budgeted count for these two facility-specific Maintenance positions. Some efficiency is expected, with an anticipated need of 1 additional Apprentice, 7 additional Mechanic A FTEs and 2 additional Facilities Supervisors.	• MTS currently employs one Apprentice and one Mechanic A for each of its two divisions. • With MTS only taking on CPD operations in Scenario 3, a need for 4 additional Mechanic A FTEs is anticipated.	No Change
Third-Party Contracts and Vendors	• Transdev currently holds 17 third-party contracts with outside vendors for buildings and grounds work and janitorial services. (See Section 6.1 of the Appendix.) • MTS will need to take on this responsibility for any divisions that are insourced. MTS has the options of working with Transdev to amend these contracts to transition them to MTS, execute new contracts with the same or equivalent vendors, or expand in-house staffing to perform the work directly.			No Change

3.9.4 PASSENGER FACILITY MAINTENANCE

This subsection discusses the passenger facility maintenance functions, which are overseen by the MTS Contract Services department. The impact to this area will be the requisite insourcing (under Scenarios 1 and 2) of the bus stop technicians currently employed by Transdev. Passenger facility maintenance tasks are currently performed by a mixed workforce of MTS and Transdev employees.

Table 3-22: Passenger Facility Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Passenger Facility and Bus Stop Maintenance	• MTS employees currently supervise a mixed MTS and Transdev workforce for passenger facility and bus stop maintenance. This includes one MTS bus stop technician and three technicians plus two power washer operators from Transdev. • If the Transdev-performed work cannot be accommodated within the current MTS-budgeted positions, five additional employees will be needed in the Sign Truck Operator position. • MTS must supply internal labor and materials or hire a third party to address bus stop maintenance and signage now performed by Transdev as a contract cost.		• Bus stop signage and maintenance may continue to be performed by Transdev for non-paratransit service operations.	No Change

3.10 Technology

MTS is the primary business owner, and Transdev is a user of most of the current software. In most instances, the technology impact of insourcing will be additional staff, staff training, potential updates to processes, and the additional resources needed to support the technology (software and hardware support). In some instances, there will be an implementation required to prepare software for the additional data needs. An implementation is the process of adding data (vehicles, facilities, operators, parts, etc.) to existing technologies, configuring the technology to process the new data, and building necessary integrations, testing, and training.

At this time, the team has only identified one instance where software procurement is required. Under Scenarios 1 and 3, MTS will need to procure software and services to implement a paratransit solution.

The project team took a three-step approach to develop the technology concept plan. The first looked at the technology itself and identified ownership and maintenance on an application-by-application basis. The second looked at the user responsible for utilizing the functionality and responsibility for the data. Finally, we looked at the need for business processes associated with the new vehicles or services associated with insourcing. Our findings presented below are organized by each scenario. As mentioned above, MTS owns and operates most of the technologies used today; therefore, the training impact on existing technologies and processes will be on assuring that any transitioned or new staff are fully capable of using and/or maintaining the technology. Where implementation or procurement is required, we have provided some additional details following the table.

Scenario 1: Insource all contract operations (fixed route, minibus, and paratransit)

Scenario 1 has the largest impact on technology. All new staff supporting insourcing will need to be trained on the MTS software and processes. Some software will require an implementation phase to configure and test the addition of new assets as part of insourcing.

- **Software Implementation Planning** – Under Scenario 1, there will be areas requiring software procurement/transfer, configuration, and testing with the addition of assets. Each is summarized below.
- **Hastus: Bidding and Dispatch** – Hastus Bidding and Dispatch will require an implementation phase to add the additional operators and vehicles to the current MTS system and processes. The implementation phase will include loading all operator data and vehicles, as well as building the appropriate integrations for the additional operator files and payroll processes. Testing will be required to ensure the data is included in the GTFS files as well as any regulatory reporting. This implementation will impact ADP Payroll and SAP Human Resources. Dispatch staff for the insourced divisions will need training in Hastus Bidding and Dispatch technology.

- **SAP: Asset Financial Management** – SAP will require an implementation phase to add the assets currently maintained by Transdev. The implementation will require a large amount of configuration and testing to ensure all components and history on existing assets are configured and then tested to ensure the assets are included in existing MTS maintenance processes. It is important to note that SAP is currently the system of record for the MTS transit asset management plan and contains the asset inventory. However, this inventory is captured at a high level. So even though the assets maintained by Transdev are in SAP today, they are not at the appropriate level to carry out maintenance. This implementation will also impact the Fleetwatch Fluid Management.
- **Procure Paratransit Software** – MTS will be required to procure and implement, or potentially transfer, paratransit software to meet the needs of operating a paratransit service in-house. If a transfer of the current Trapeze technology is not feasible, MTS will need to go through a requirements phase to create a statement of work and issue a Request for Proposal (RFP) for software and implementation services. Implementation services will include the configuration, testing, and training of the paratransit solution. Technology transfer would require many of the same services to assure that it meets all MTS requirements.

Scenario 2: Insource contract-operated fixed route and minibus

Under this scenario, the technology impacts are associated with the Hastus solution for operations, the SAP solution for maintenance, and then the SAP Human Resource solution for payroll captured above.

Scenario 3: Insource contract-operated paratransit operations only

MTS will be required to transfer or procure and implement paratransit software. Details can be found above under Scenario 1.

Table 3-23: Technology Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Operations Software Process[6]	• Account for additional operational staff training. • Procure or transfer software license for paratransit operations. • Implementation to configure and test new existing software with additional data.	• Account for additional operational staff training. • Implementation to configure and test existing software with additional data.	• Account for additional operational paratransit staff training. • Procure software for paratransit operations. • Implementation to configure and test new software with additional data.	No Change
Maintenance Software and Process	• Account for additional operational staff training. • Implementation to configure and test existing software with additional data.	• Account for additional operational staff training. • Implementation to configure and test existing software with additional data.	• Account for additional operational staff training. • Implementation to configure and test existing software with additional data.	No Change
Fare Collection	No Change	No Change	No Change	No Change
Other Support Technologies	• Account for additional operational staff training. • Implementation to configure and test existing software with additional data.	• Account for additional operational staff training. • Implementation to configure and test existing software with additional data.	No Change	No Change

[6] As mentioned above, MTS owns and operates most of the technologies used today; therefore, the impact of training staff on existing technologies and processes will be on assuring that any transitioned or new staff are fully capable in use and/or maintenance of the technology.

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing	• MTS will need to increase IT staffing, with an anticipated need for 5 additional FTEs. • This increase will fall within the following titles: Business Systems Analyst (SAP) (+1), IT Support Specialist (+2), Network Engineer I (+1), and Systems Administrator (+1).	• MTS will need to increase IT staffing, with an anticipated need for 4 additional FTEs. • This increase will fall within the following titles: Business Systems Analyst (SAP) (+1), IT Support Specialist (+1), Network Engineer I (+1), and Systems Administrator (+1).	• MTS will need to increase IT staffing, with an anticipated need for 3 additional FTEs. • This increase will fall within the following titles: Business Systems Analyst (SAP) (+1), IT Support Specialist (+1), and Systems Administrator (+1).	No Change

3.11 Communications/Customer Service

This section discusses potential impacts to MTS's Marketing and Communications department or Customer Service. As shown in *Table 3-24*, the only impact relates to staffing for the Paratransit customer service representative and fixed route passenger support representative positions. MTS already handles general customer service and communications systemwide for fixed route and these areas would not be impacted by insourcing. Transdev does staff customer service agents and SBD and ECD who are responsible for lost and found and customer complaint investigations. These efforts would transfer to MTS at any insourced divisions.

Table 3-24: Communications/Customer Service Insourcing Considerations

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Customer Service Clerks	No Change	No Change	No Change	No Change
Communications and Marketing	No Change	No Change	No Change	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Paratransit Customer Service Representatives Staffing	• MTS will need to hire or transition customer service representatives (reservationists) for MTS Access (Paratransit). • These positions could be budgeted in the Passenger Services department or a new Paratransit Department that would likely need to be established for other titles.	No Change	• MTS will need to hire or transition customer service representatives (reservationists) for MTS Access (Paratransit). • These positions could be budgeted in the Passenger Services department or a new Paratransit Department that would likely need to be established for other titles.	No Change
Passenger Support Representatives Staffing	• Transdev currently employs three Customer Service Ambassadors, whose positions would likely need to carry over with insourcing. • These roles could be absorbed as additional positions in the Passenger Support Representatives title, which is budgeted under the Passenger Support department within Rail Operations.		No Change	No Change

4. Key Issues by Scenario

This section summarizes the most pressing challenges, impacts, or considerations for each of the insourcing scenarios. Additionally, this section presents a preliminary estimate of the FTE impact on MTS's budgeted positions under each of the scenarios. More detailed analysis and cost estimates will be provided in a subsequent report.

Table 4-1: Key Issues by Scenario

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Staffing Impacts	• Preliminary estimates for impacts to budgeted FTEs counts are shown in *Table 4-2*.			No Change
Labor Representation	• Resolution of labor representation for each of the insourced Transdev operating elements. • Conflict between current non-represented MTS Supervisors and represented Transdev Supervisors.	• Resolution of labor representation for each of the insourced Transdev operating elements. • Conflict between current non-represented MTS Supervisors and represented Transdev Supervisors.	• Retention of current labor representation for Paratransit services.	No Change
Wage Rate Differential	• Significant difference between MTS and Transdev.	• Significant difference between MTS and Transdev fixed route services.	• Significant difference between MTS and Transdev's Paratransit staff for similar job classifications.	No Change
Work Rule Differences	• Detailed in Labor Section.	• Detailed in Labor Section.	• No existing in-house MTS Paratransit operation, but similar differences to resolve for similar job classifications.	No Change
Expanded MTS Human Resources Effort	• Significant burden for expanded MTS recruitment and hiring to accommodate more than a doubling of the current MTS operational workforce.	• Significant burden for expanded MTS recruitment and hiring to accommodate an approximate doubling of the current MTS fixed route operational workforce.	• Significant burden for expanded MTS recruitment and hiring to accommodate the additional staffing needs of the paratransit operational workforce.	No Change

Item	Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)	Scenario 4 (None)
Disparate Maintenance Hiring Practice	• MTS hires Mechanics at the entry level and trains them via a prescribed program for advancement. Transdev hires Mechanics at the level that is open and has a less formal training procedure. • Beyond the general labor representation issues, MTS will also need to resolve the conflict between the current requirement that MTS Mechanics complete the MTS Apprenticeship program and the likely need to hire existing Transdev mechanics who have not completed the program.			No Change
Legal and Risk Management	• More than doubling the volume of directly-operated fixed route service, and adding paratransit, will significantly increase MTS's risk exposure. • MTS will need to increase its self-insured retention and likely purchase additional commercial liability coverage. • This increased exposure will significantly increase third-party liability claims and worker's compensation claims for MTS, and require additional staffing.			No Change

Positions Impacts

Figure 4-1 below provides a comparison of the projected total FTEs by scenario, with the FY26 MTS baseline and Transdev staffing levels for reference. *Table 4-2* shows the current budgeted MTS positions in FTEs by department (proposed FY2026 budget) and the projected positive or negative impact for each scenario. Note that the current positions are presented first (and represent the likely position counts under the do-nothing alternative/Scenario 4), while the three insourcing scenarios are presented in the table's final three columns. Blank cells for a department indicate no projected change.

The project team developed this preliminary estimate, which has been reviewed by MTS departmental staff, by adapting the proposed FY2026 budgeted positions count for each of the three change scenarios. Multi-departmental input from MTS and the project team's analysis and on-site observations indicate that staffing levels at the Transdev-operated divisions generally align with the MTS divisions, relative to size, and with transit industry best practice. This estimate generally carries over the position counts for the essential Transdev positions, except where they would be redundant and duplicative or in a few instances MTS practice called for enhanced staffing (e.g., maintenance technicians and storeroom clerks). Inputs include:

- Interviews and emails with MTS staff regarding their current departmental staffing, workload, and capacity for additional responsibilities
- Current employee lists for SBD and ECD
- Current employee list for CPD, amended with input from MTS Contract Services to better reflect actual headcount requirements at CPD and to allocate labor resources between Paratransit and Minibus

Figure 4-1: Budgeted FTE Projections by Scenario

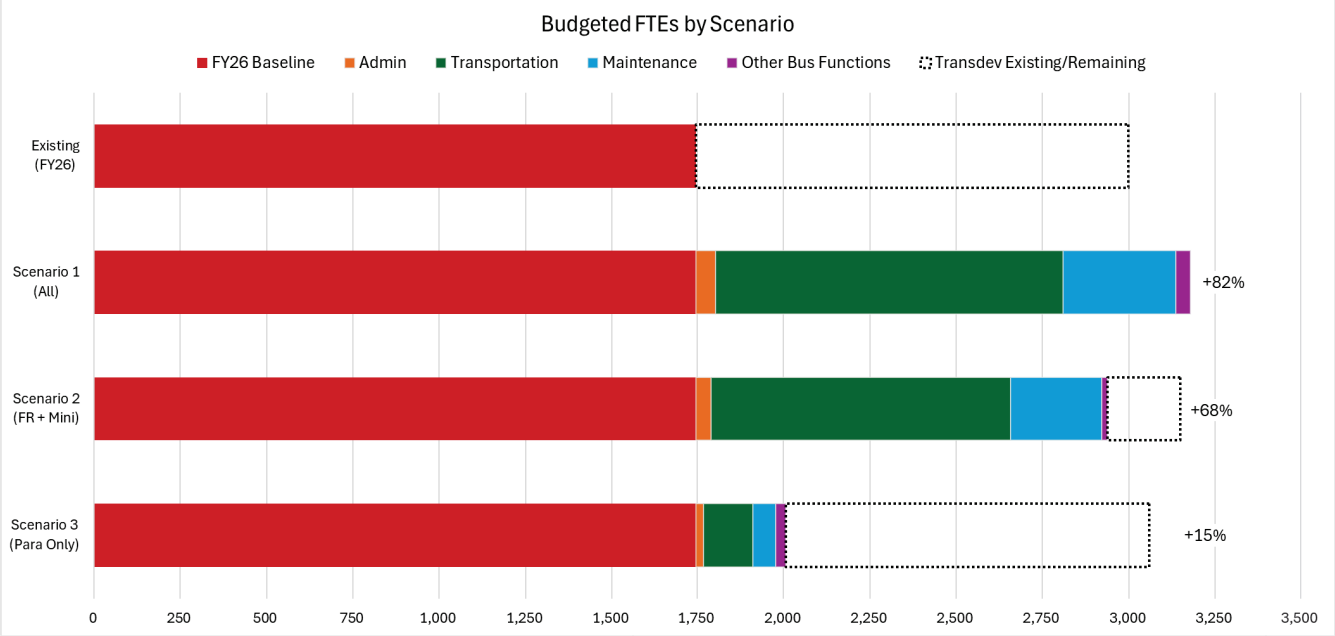


Table 4-2: Estimated Impacts to Budgeted FTE Positions

Operational Area	Department	Current (Prop. FY26) / Scenario 4 (None)	Change to MTS FTE Positions (+/-)		
			Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)
Administration	Board Admin	2.0			
	Capital Projects	10.5			
	Pronto Regional	14.5			
	Executive	5.0			
	Finance	25.5	+12.0	+9.0	+3.0

Operational Area	Department	Current (Prop. FY26) / Scenario 4 (None)	Change to MTS FTE Positions (+/-)		
			Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)
	Human Resources	19.0	+10.0	+10.0	+5.0
	IT Security	3.5			
	Information Technology	32.0	+5.0	+4.0	+3.0
	Legal	4.5			
	Marketing	11.0			
	Planning	9.5	+2.0	+1.0	+1.0
	Procurement	16.0	+4.5	+4.5	+2.0
	Right of Way	2.0			
	Risk	4.0	+3.5	+2.0	+1.5
	Security	139.0			
	Stores (Admin)	2.0			
	Stores (Bus)	13.0	+19.0	+14.0	+6.0
	Stores (Rail)	7.0			
	Telephone Information Services	17.0			
	Transit Store	8.0			
Contract Services	Contract Services	8.5	-5.5	-3.5	-2.0
Bus Operations	Executive (Bus)	2.0	+1.0	+1.0	
	Maintenance	189.0	+315.0	+253.0	+62.0
	Maintenance-Facility	5.0	+11.0	+10.0	+4.0
	Passenger Services	9.0	+1.0	+1.0	+1.0
	Revenue (Bus)	6.0	+4.0	+4.0	
	Safety (Bus)	2.0	+3.0	+2.0	+1.0
	Training (Bus)	11.0	+11.0	+9.0	+4.0
	Transportation (Bus)	564.0	+1,008.5	+867.5	+143.0

Operational Area	Department	Current (Prop. FY26) / Scenario 4 (None)	Change to MTS FTE Positions (+/-)		
			Scenario 1 (All)	Scenario 2 (FR + Mini)	Scenario 3 (Para Only)
	Paratransit[7]	0.0	+25.0		+25.0
Rail Operations	Executive (Rail)	4.0			
	Facilities	81.0			
	Light Rail Vehicles	107.0			
	Maintenance of Wayside	46.0			
	Passenger Support	22.5	+3.0	+3.0	
	Revenue (Rail)	33.0			
	Track	22.0			
	Transportation (Rail)	282.2			
FHV Admin (Taxi)	Taxi	7.0			
All MTS	**Grand Total**	**1,746.2**	**+1,433.0**	**+1,191.5**	**+259.5**

[7] Not currently an MTS department. Oversight positions for Paratransit are currently budgeted within the Contract Services department, but all operational, administrative, or maintenance positions for Paratransit are outsourced.

5. Conclusion

5.1 Key Findings and Considerations

Any of the insourcing scenarios discussed in this report carry significant impacts for MTS, especially Scenarios 1 and 2 that would bring the Transdev fixed route divisions in-house.

- The most notable impact to MTS in these scenarios is a **substantial increase to the number of budgeted full-time positions** at the agency and addressing the pay and benefit differentials. While estimated cost impacts were not part of this task and will follow in a later task, this major staffing increase has the potential to significantly increase MTS's annual operating costs for the same service as compared to what MTS currently pays Transdev.
- Beyond this staffing (and potential cost) impact, the other major challenge is **resolving the labor representation and bargaining unit structure** issues discussed in this report. Either option for converting represented Transdev employees to MTS employees has significant challenges and will require close consideration of the relevant labor unions' positions and interests and careful negotiation to avoid issues that could lengthen the implementation timeline or hinder the process if the MTS Board pursues insourcing.
- The other major structural challenge relates to the **Maintenance apprenticeship program** requirements for Mechanics. Transdev hires directly for the level that is open while MTS hires at an entry level and then develops their maintenance workforce in-house through the apprenticeship program.

5.2 Next Steps

The project team will continue to work with MTS staff across departments to refine the insourcing scenarios and ensure thorough identification and understanding of impacts associated with potential insourcing. Through the remainder of 2025, the team will develop the insourcing implementation strategies and cost impacts as the insourcing feasibility study progresses through Tasks 3 and 4.

6. Appendix

6.1 List of Additional MTS and Transdev Vendors

Table 6-1: List of MTS-Held Third-Party Contracts for Passenger Facilities

Subcontractor/Vendor Name	Services Provided
Ahlee Backflow Service, Inc.	Backflow testing
Advanced Railway Innovations (ARI/AEI)	On-call Electrical
Aztec Landscaping	BRT Landscaping
BriceHouse	Bench Advertising and Maintenance
Bryce Fastener	One-of a kind bits and screws for MTS, pylons
Cable Pipe & Leak Detection	Underground Utility Detection for BRT and Stations
Calsense	Irrigation Control Boxes
Clean Harbors Environmental Services	On-Call Blood and Hazmat Cleanup
Clear Channel Outdoor	Shelter Advertising and Maintenance
Clear Sign & Design	Signage, Kiosks, and Repairs
Comfort Mechanical	HVAC for Communication Cabinets and BRT Stations
Continental Locks	Locksmith
Diamond Environmental Services	Portable Restrooms
Drain Medic	On-Call Plumber
ESS	VMS Maintenance and Badge Reader Repairs
Fire Services Corp.	Fire Extinguisher Monitoring and Maintenance
Hector Lopez	Janitorial Maintenance at the Tecate Bus Terminal
HiTech	Smart Parking Monitoring and Repairs (Sabre Springs Parking Structure)
Johnson Controls/Simplex	Fire Alarm Monitoring
KONE	Elevator Maintenance and Monthly PM
NMS	BRT Janitorial Maintenance, Power Washing, and Pest Control (77 Rapid Stations)
NOVA	Driver Restroom Janitorial Service (Fashion Valley and El Cajon Transit Centers)
Site One	Annual Calsense Prepaid Data Plan for Cellular Modem to Communicate with Irrigation Control Box
SoCal Stormwater	BRT Storm Drain Cleanup (Twice Annually) and Reporting to Environmental Liaison
Vinyard Doors	Vehicle and Pedestrian Gate Repair (Sabre Springs)
Wescomm	Sabre Springs Payphone Management

Table 6-2: List of Transdev-Held Third-Party Contracts

Category	Subcontractor/Vendor Name	Services Provided
Outside Labor	Ace Radiator	Radiator Leak Repairs
	Cummins	Engine Repair
	Jim's Glass	Glass Installation
	Luminator	Electrical Repairs
	Wetmores	Commercial Truck Parts
Towing	Road One Towing	Towing
Environmental Services	Asbury Environmental Service	HAZMAT Pick-up & Disposal
	Continental Tire	Tire Sales & Disposal
	Entech Engineering	Engineering Consulting
	Exxon Mobil	Oil Samples
	Wetmores	Batteries
	Safety Kleen	HAZMAT Pick-up & Disposal
	SC Fuels	Fuel Supplier
Bus Body Work	Roman's Truck	Major Body Damage Repair
	ARI	Fleet Services
	Jim's Glass	Glass Installation
Buildings & Grounds	Adios Pest Control	Pest Control Service
	Advanced Air and Vacuum	Air Compressor Sales & Service
	Air Vac Systems	Compressor Service & Inspection
	American Residential Services (ARS)	Plumbing & HVAC Services
	Bert's Office Trailer	Office Trailer Rentals
	Dimond Environmental Services	Port-a-Potties
	Global Power	Generator Service & Sales
	Grainger	Industrial Grade Supplies
	KONE	Elevator Inspection Service
	Low Voltage	Electrical Engineering
	Pro Link	Fence Repairs
	Pure Tec Industrial Water	Water Cooler Techs
	R.S. Hughes	Cleaning Chemicals
	Shred-it US	Document Shredding Services
	Superior Cleaning Equipment	Cleaning Supplies
	West CPM	Commercial/Industrial HVAC Repair
Janitorial Services	DCG Janitorial	Janitorial Services

Metropolitan Transit System

Transit Operations Insourcing Feasibility Study – Task 2 – Operational and Administrative Concept Plan

Board of Directors

Project Overview

18-month study to understand the feasibility of insourcing contract transit operations and the impacts to MTS, its employees, and riders/community

Project structured in four phases:

- **Task 1: Existing Conditions Analysis**
  - Summary report for both in-house and contracted operations, through interviews, document review, and data analysis
- **Task 2: Operational & Administrative Concept Plan**
  - Concept plan for four insourcing scenarios
  - Challenges, opportunities, and advantages associated with each scenario, with impacts organized by department/function
- **Task 3: Implementation Transition Strategy & Schedule**
  - Detailed implementation plan for each scenario, with strategies that consider all opportunities and challenges
- **Task 4: Cost Implications & Impacts**
  - Cost projection for each scenario, outlining changes to positions, functions, policies and procedures, and financial risks

Project Overview

18-month study to understand the feasibility of insourcing contract transit operations and the impacts to MTS, its employees, and riders/the public

Project structured in four phases:

☑ **Board Update and Discussion**

Aug 2024	Sep 2024 ☑	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025 ☑	Apr 2025	May 2025	Jun 2025 ☑	Jul 2025	Aug 2025	Sep 2025 ☑	Oct 2025	Nov 2025	Dec 2025	Jan 2026 ☑
Project Start	1. Existing Conditions																
					2. Operational/Admin. Concept Plan												
								3. Implementation Strategy									
												4. Cost Implications/Impacts					**Final Plan**

Project Overview

- Insourcing Feasibility Study will consider four scenarios:

Insourced Services	Fixed Route	Minibus	Paratransit
Scenario 1: All Contract Operations	X	X	X
Scenario 2: Fixed Route & Minibus Only	X	X	
Scenario 3: Paratransit Only			X
Scenario 4: Do Nothing			

Service & Performance Comparison

- Transdev delivers service at a fairly similar quality and reliability as in-house – “One MTS” for the customer
- Annual metrics that are separated for in-house vs. contract-operated show MTS moderately out-performed Transdev in FY 2024

Fixed Route Performance Metrics (FY24 Annual Report)		
Metric	**MTS**	**Transdev**
% of Weekly Bus In-Service Miles (Sept. 2024)	43.7%	56.3%
Scheduled Weekday Peak Buses (Sept. 2024)	205	287
Preventable Accidents per 100k Miles	1.07	1.38
Mean Distance Between Failures (MDBF)	6,645	6,051
Complaints per 100k Passengers	4.5	8.6
Operational Cost per Revenue Mile	$13.52	$8.87

Operational & Administrative Concepts

- Concept Plan work began in January 2025, with report submitted to MTS in May
- Developed department-level concepts for each scenario – staffing impacts, labor relations, HR/training, assets, procurement, legal/risk, finance, technology, and operations and maintenance
- Cost projections and implementation plan to be developed in later tasks

Staffing Concepts

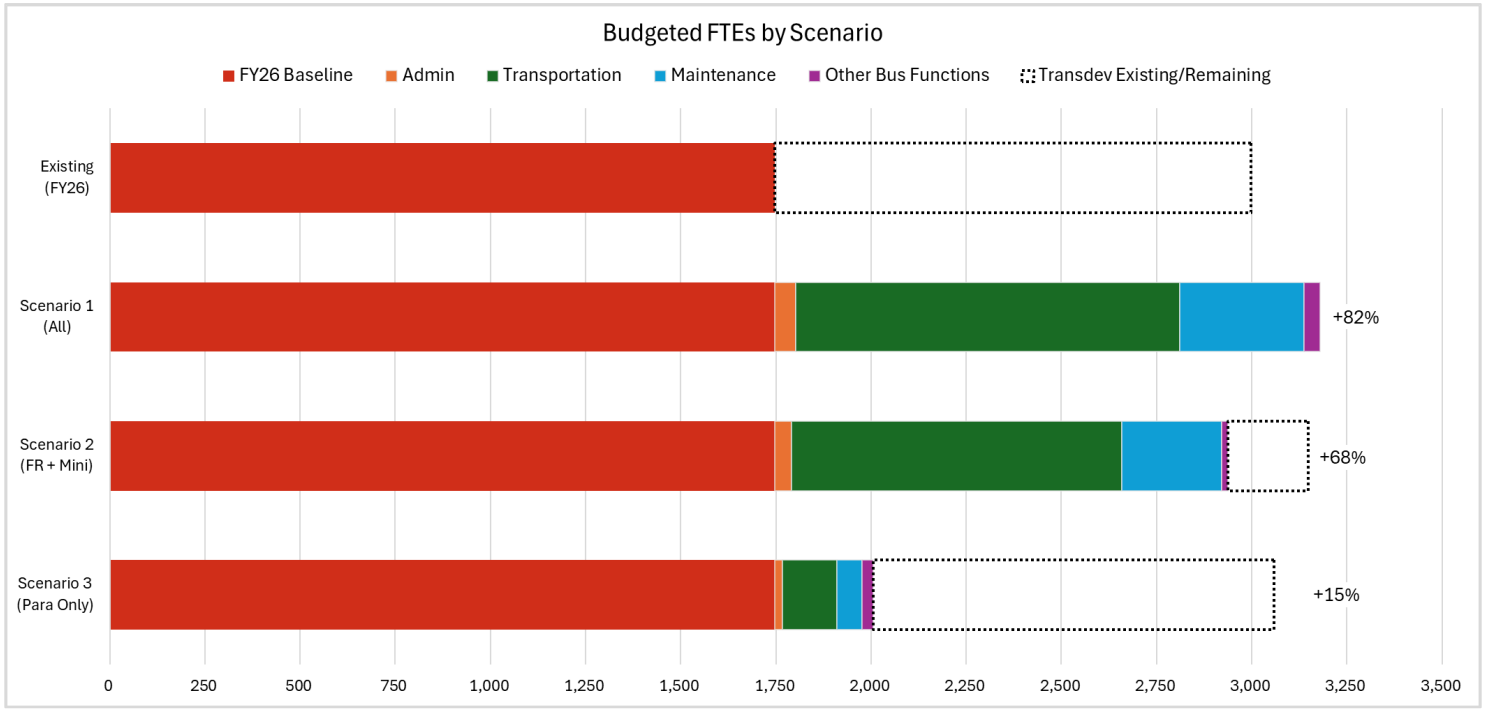
- Insourcing, especially the two fixed route divisions, will require substantial increase to budgeted FTEs (+1,433 positions)
- Current Budgeted FTEs (FY26)*: 1,746.2 (352.0 Admin. + Taxi, 796.5 Bus, 597.7 Trolley)

Estimated Additional Positions	Scenario 1 (All)	Scenario 2 (Fixed Route + Minibus)	Scenario 3 (Para Only)
MTS Administration	+56.0	+44.5	+21.5
Bus Operations – Transportation	+1,008.5	+867.5	+143.0
Bus Operations – Maintenance	+326.0	+263.0	+66.0
Bus Operations – Other Functions	+42.5	+16.5	+29.0
Total	**+1,433.0**	**+1,191.5**	**+259.5**

** Budgeted FTEs would remain the same as current under Scenario 4 (Do Nothing).*

Staffing Concepts

- Insourcing, especially the two fixed route divisions, will require substantial increase to budgeted FTEs (+1,433 positions)
- Current Budgeted FTEs (FY26): 1,746.2 (352.0 Admin. + Taxi, 796.5 Bus, 597.7 Trolley)



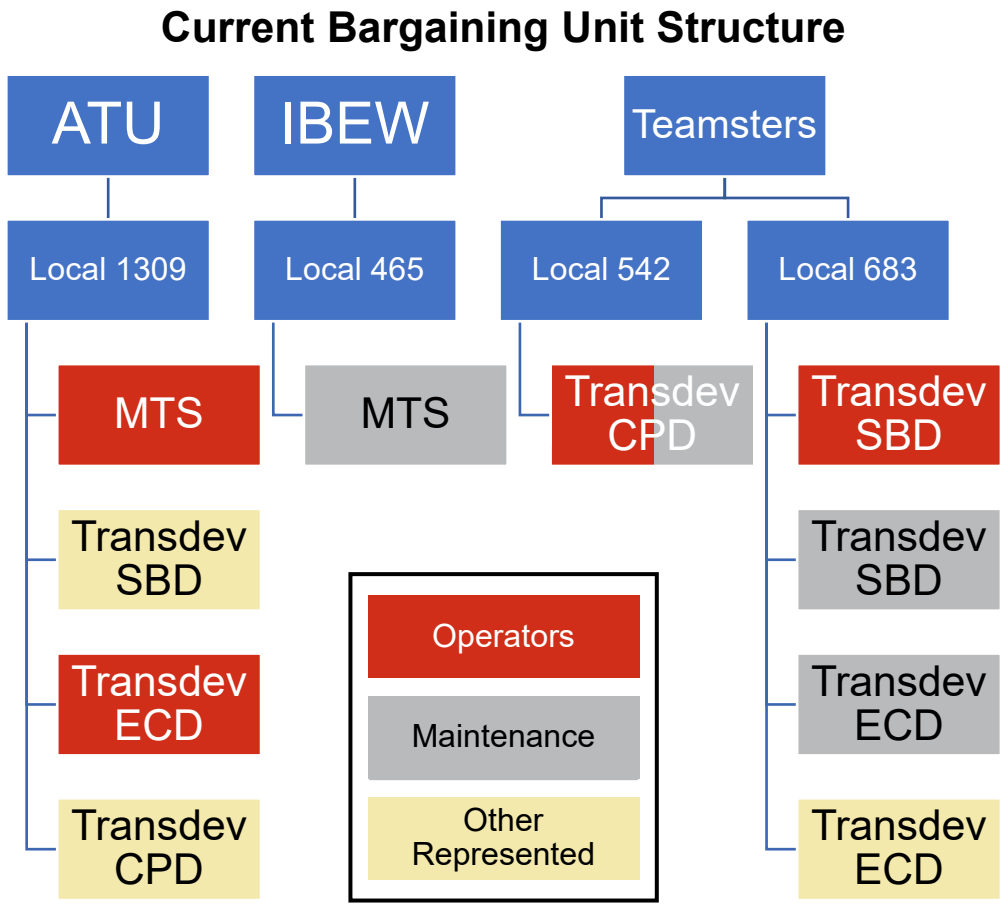
Employee Wage Differences

- Most classifications and job titles at Transdev are paid less than MTS counterparts
- In addition to wages, health and retirement benefits are also expected to be big drivers of cost differences

Current Top Hourly Wage (As of 7/1/25)				
Example Positions	MTS (IAD/KMD)	Transdev Divisions		
		South Bay	East County	Copley Park
Bus Operators	$36.63 (After 5.5 Years)	$30.00 (After 3 Years)	$29.00 (After 4 Years)	$28.50 (After 5 Years)
Mechanics	$44.63	$42.84	$39.00	$36.50
Bus Servicers	$24.07	$20.88	$19.20	$20.00

Bargaining Units

- Resolving labor union representation and bargaining units brings complex challenges for MTS.
- **MTS**: 2 union locals and 2 bargaining units
- **Transdev**: 3 union locals and 8 bargaining units



Bargaining Unit Concepts

- Two options are available and will dictate the number of collective bargaining agreements (CBAs) MTS will need to negotiate:
  - Option 1: Bring Transdev employees into MTS bargaining units
  - Option 2: Bring current Transdev bargaining unit structure over to MTS

Bargaining Units	Scenario 1 (All)	Scenario 2 (Fixed Route + Minibus)	Scenario 3 (Para Only)
Option 1 – Transdev into MTS Units	2 (or 3)*	2 (or 3)*	2 (or 3)*
Option 2 – Maintain Transdev Units	10	8-10**	4

* Need for third bargaining unit will depend on outcome for Road Supervisors title (Currently represented at Transdev, but not at MTS)

** Under Scenario 2, Minibus service would be relocated out of CPD; TBD if insourced Minibus staff would preserve bargaining units or join other former Transdev units. CPD operators and mechanics are represented by a different Teamsters local (542) than SBD/ECD employes (Local 683).

HR/Training

- Need to ensure insourced employees meet all MTS qualifications and assess need for refresher training
- All new-employee training at insourced divisions to follow existing MTS programs
  - Fixed Route Operations – Need to decentralize route training
  - Paratransit Operations – Need to establish new MTS training curriculum and program for Access
  - Maintenance – Expand MTS Apprenticeship Program to insourced divisions

Capital Assets & Procurement

- MTS already owns the bus divisions, revenue fleet, and other major assets
- Transdev owns tires, bus parts, non-revenue vehicles, and minor equipment that MTS will need to acquire/transfer/lease M&S at insourced divisions
- MTS will need to assume all procurement for insourced divisions with additional staffing required
- Expanded storeroom operations will require additional staffing; MTS will also need to carry costs of additional parts inventory

Legal & Risk Management

- More than doubling the volume of directly-operated fixed route service, and adding paratransit, will significantly increase MTS's risk exposure
- MTS will need to increase its self-insured retention and purchase additional commercial liability coverage
- This increased exposure will significantly increase third-party liability claims and worker's compensation claims for MTS, require additional staffing, and increase insurance premiums

Finance & Accounting and Technology

- F&A will assume much larger role with expanded operations and require additional payroll and accounting staff
- Technology concept includes:
  - MTS owns most current technology contracts/licenses used by Transdev; will need to acquire/transfer computer hardware for insourced divisions
  - Acquire/transfer paratransit operations/dispatching software
  - Shift insourced Operations from Transdev's VDS to HASTUS Daily
  - Shift insourced Fleet Maintenance from Transdev's RTA to MTS's SAP

Operations

- Transition insourced fixed route divisions to MTS policies and procedures
  - Examples: Division dispatching, extraboard management, bus pull-out/pull-in, and field supervision and communications
  - Develop/transition operating procedures for new in-house Paratransit division
- Insourced divisions to follow MTS staffing approach and levels
  - Examples: Dispatchers, Supervision

Maintenance

- Transition insourced divisions to all MTS Maintenance standards and procedures
  - Transition to MTS SAP software from RTA used by Transdev
  - Shift insourced divisions to greater reliance on in-house body work and switch to MTS tire leasing
- Insourced divisions to follow MTS staffing approach and levels
  - Bring Mechanics, Servicers, and Storeroom Clerks up to MTS resource and coverage ratios

MTS Board Updates

- MTS staff and consultant team will continue to seek Board input and provide regular updates on project progress and findings
- Past and Planned Board updates:
  - **September 2024**: Project introduction/overview
  - **March 2025**: Existing conditions findings
  - **June 2025**: Operational insourcing concept plan briefing
  - **September 2025**: Cost and implementation strategies
  - **January 2026**: Final plan briefing

Next Steps

- Project team to develop overview of costs and implementation strategies
- Next Board update planned for September 2025 to present overview of implementation plan

Questions/Comments

Metropolitan Transit System

Agenda Item No. 26

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Zero Emission Bus (ZEB) Program and Transition Plan Update (Mike Wygant and Jarrett Valdez)

INFORMATIONAL ONLY

Budget Impact

No impact.

DISCUSSION:

In October of 2017, the Board of Directors authorized the Chief of Executive Officer (CEO) to develop a Pilot Project to test the use of ZEB's in our service area to further understand the potential impacts of the proposed California Air Resources Board (CARB) Innovative Clean Transit (ICT) regulation.

In 2018, CARB passed the ICT regulation, which mandated transit operators with fleets larger than 100 buses to fulfill specific ZEB purchase requirements starting in 2023. In September 2020, the Board of Directors approved the ZEB Rollout Plan for submittal to CARB, and the MTS ZEB Transition Study. As required by the regulation and the Board approved plan, staff will provide annual updates and status of the transition.

In June 2025, the ZEB Transition Study document was updated by MTS staff to reflect the status of the transition, current costs, projected costs, and performance of the current vehicles. (Attachment A.)

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachment: A. ZEB Transition Plan

Metropolitan Transit System

Zero-Emission Bus Fleet Transition Study Update 2025

June 2025

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Executive Summary

MTS engaged the Center for Transportation and the Environment (CTE) to perform a zero- emission bus (ZEB) transition study in March 2018. The study's goal was to create a plan for a 100% zero-emission fleet by 2040 to be in compliance with the Innovative Clean Transit (ICT) regulation enacted by the California Air Resources Board (CARB). The results of the study were used to inform MTS Board members and educate MTS staff of estimated costs, benefits, constraints, and risks to guide future planning and decision making. In addition to the ZEB transition study, MTS initiated a pilot program to test ZEB technology in their service to better understand the technology and inform decision making.

In support of the Pilot in 2019, MTS installed six (6) 62.5- kilowatt (kW) ChargePoint vehicle chargers at the Imperial Avenue Division (Imperial Ave) and deployed six (6) 40-foot New Flyer battery-electric buses (BEBs). In 2020, MTS installed an additional two (2) ChargePoint chargers each at South Bay Bus Maintenance Facility (South Bay), Kearny Mesa Division (Kearney Mesa), and the East County Bus Maintenance Facility (East County) to facilitate BEB pilot operations throughout the service area. Two (2) 40-foot Gillig BEBs were deployed in early 2021 and later December 2021, five (5) additional Gillig BEBs were deployed. The pilot program ended shortly after that. In September 2023, MTS finished constructing an overhead gantry that includes twenty-four (24) Schunk pantographs which is powered by eight (8) Heliox 180kw charging cabinets at the South Bay Division. Shortly after the overhead structure was completed, twelve (12) 60-foot New Flyer BEBs were deployed to serve a dedicated route. Thirteen (13) BEBs were purchased in 2024 and will be delivered in Q2 2025.

Zero-emission technologies considered in this study update include BEBs and hydrogen fuel cell-electric buses (FCEBs). BEBs and FCEBs have similar electric drive systems that feature a traction motor powered by a battery. The primary difference between BEBs and FCEBs, however, is the amount of battery storage and how the batteries are recharged. The energy supply in a BEB comes from electricity provided by an external source, typically the local utility's grid, which is used to recharge the batteries. The energy supply for an FCEB is completely on-board, where hydrogen is converted to electricity using a fuel cell. The electricity from the fuel cell is used to recharge the batteries to extend the range. The electric drive components and energy source for a BEB and FCEB are illustrated in Figure 1.

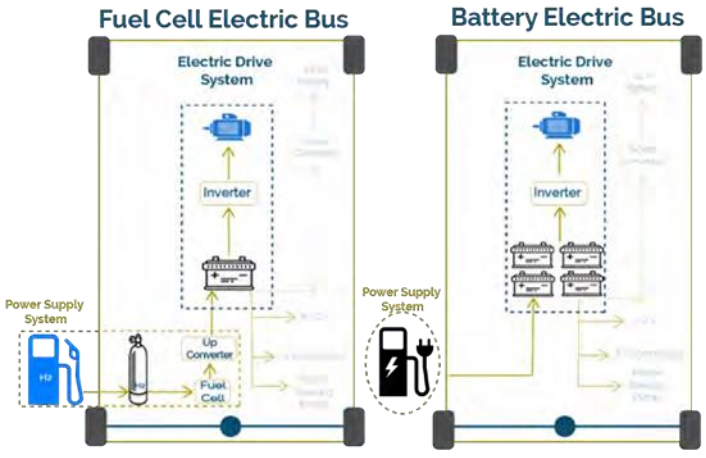


Figure ES-1 – Battery and Fuel Cell Bus Schematic

On December 14, 2018, CARB enacted the ICT regulation with a statewide goal, requiring all California public transit agencies to gradually transition to a 100 percent (%) zero-emission bus (ZEB) fleet. The ruling specifies the timeline for the required annual percentage of new bus procurements that must be zero-emission, starting with 25% of new bus purchases in 2023 and ramping up to 100% of new bus purchases in 2029. Following this schedule is intended to lead to a 100% zero-emission fleet in 2040. However, there are some waivers that allow for purchase deferrals in the event of economic hardships or if the technology has not matured to meet the service requirements of a given route. These concessions recognize that the technology may cost more than current technologies on a life cycle basis and the technology may not currently meet all service requirements.

CTE worked closely with MTS staff during the original transition study to develop the approach, define the assumptions, and confirm the results. The approach to the study was based on analysis of five (5) scenarios:

1. Baseline
2. BEB Depot-Only Charging
3. BEB Depot and On-Route Charging
4. FCEB Only
5. Mixed BEB and FCEB

A primary assumption for the transition analysis was that MTS is unable to increase fleet size as a strategy to overcome BEB range limitations to achieve a 100% ZEB transition due to space constraints present at the current MTS depots. The Baseline scenario assumed that there were no changes to the current technology for bus procurements (e.g. compressed natural gas [CNG], gasoline, diesel, propane) and is used for comparison to the other ZEB transition scenarios. The BEB Depot-Only Charging and FCEB Only scenarios were used as the 'bookends' to help identify potential constraints or risks in scaling to fleetwide adoption of ZEBs that may not be readily apparent from pilot-bus deployments.

Mixed BEB and FCEB scenario was developed with the underlying assumption that neither exclusively BEB and FCEB technology is suitable for 100% of the fleet replacement due to inherent constraints. Since the completion of the 2020 study, MTS has adopted the Mixed BEB and FCEB scenario to implement towards the transition. While manufacturers have produced BEBs for each of the vehicle lengths and types used at MTS, only 40' and 60' BEBs have completed Altoona testing and are applicable under the CARB ICT regulation. Currently, FCEBs have only been produced in 40' and 60' models. In addition, due to the limited deployment of FCEBs in service in the United States, FCEB and hydrogen fuel costs remain high. These costs were predicted to come down in the future as more vehicles are deployed and as hydrogen production ramped up; however, there is currently no basis for assuming future cost reductions. Significant investments in hydrogen production and distribution infrastructure are required and will take years to develop to gain a better understanding of the long-term costs for FCEB deployment.

Improvements in technology beyond the current state are expected, but there is no indication of when we may see the BEB technology improve to the point of one-for-one replacement of internal combustion engine vehicles or when the cost of FCEB or hydrogen fuel will decrease to competitive

levels. As a result, when considering all the various scenarios, this study can be used to develop an understanding of the range of costs that may be expected for MTS' ZEB transition.

In the 2020 transition study, CTE completed the following assessment to develop cost estimates for each transition scenario. The Baseline and Mixed BEB & FCEB figures below have been updated and compared to reflect 2025 costs.

1. Fleet Assessment
2. Fuel Assessment
3. Infrastructure/Facilities Assessment
4. Maintenance Assessment
5. Total Cost of Ownership Assessment

These assessments result in a total cost of ownership, inclusive of capital investments (ZEBs and fueling infrastructure) and operating expenses (fuel and maintenance) over the transition period (2020 – 2040) for the Baseline and Mixed BEB & FCEB scenario. The table and figure below provide a side-by- side comparison of the cumulative transition costs for the Baseline and Mixed BEB & FCEB approach.

	Baseline	**Mixed BEB and FCEB**
Fleet	$1,263,176,640.87	$1,543,816,832.87
Fuel	$380,886,639.99	$441,231,673.26
Infrastructure/Facilities	$-	$487,263,937.50
Maintenance	$525,268,109.81	$530,393,271.58
Total	$2,169,331,390.67	$3,002,705,715.20
Incremental Cost Over Baseline		**$833,374,324.53**
% ZEB in 2040	**5%**	**99%**

Table ES-1 – Total Cost of Ownership, Baseline vs Mixed BEB & FCEB

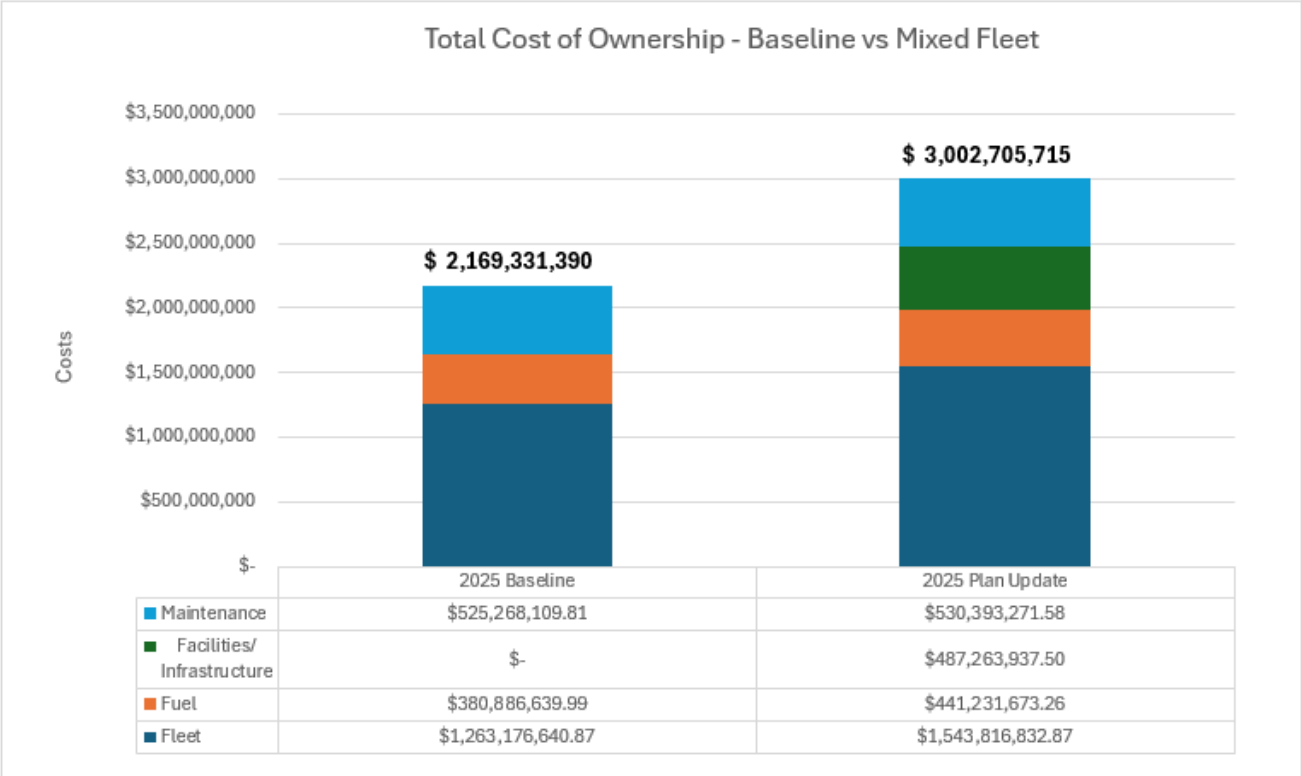


Figure ES 2 – Total Cost of Ownership, Baseline vs. Mixed BEB & FCEB

The Mixed BEB and FCEB approach is projected to transition approximately 99% of the fleet, with an incremental cost of approximately $833 million by 2040. There will be expected complexities with managing the fleet through the transition that would require maintaining existing internal combustion engine vehicle infrastructure (CNG, propane, and gasoline), installing new BEB infrastructure, and installing new FCEB fueling infrastructure. Space constraints at the depot will require careful planning if this path is continued.

MTS has accumulated ZEB credits from their procurement of ZEBs prior to 2023. These credits can be used in place of ZEB purchases to satisfy CARB's ZEB procurement requirements which started in 2023. With the purchase of thirteen (13) BEBs to support the ZEB pilot operations in 2019 and 2020, and the purchase of twelve (12) BEBs to support a new service in 2021, MTS recently had twenty-five (25) ZEB credits that can be applied to ZEB purchase requirements from 2023 and beyond. In February 2025, the MTS Board of Directors approved a request to CARB, utilizing seven (7) credits for FY25 bus purchases and thirteen (13) credits for FY26 bus purchases, both extinguishing the 25% ZEB requirement for those fiscal years. These developments have been incorporated into this analysis.

As a result, recommendations for MTS are as follows:

1. Remain proactive with ZEB deployments: MTS has been proactive in the purchase and deployment of BEBs throughout the ZEB Pilot Program and since it has ended. To incorporate FCEBs into the fleet, lower fuel costs and lower costs associated with the production hydrogen will be required. MTS should move forward carefully, taking

advantage of various grant and incentive programs to offset the incremental cost for ZEB deployment.Target specific routes and blocks for early ZEB deployments: MTS should consider the strengths of given ZEB technologies and focus those technologies on routes and blocks that take advantage of their efficiencies and minimize the impact of the constraints related to the respective technologies. Technologies cannot follow a "one-size-fits-all" approach from either a performance or cost perspective. Matching technology to the service will be a critical best practice.

2. Continue with BEBs and consider FCEBs: At this stage, it is too early to tell which technology will dominate the market 10 to 20 years from now. Having the capability to deploy both ZEB technologies creates an opportunity for MTS to fully assess BEBs and FCEBs to determine which technology can best meet the operational range requirements while being financially efficient and sustainable.
3. Do not over commit to one form or brand of technology over another. ZEB and charging technology is rapidly changing each day as battery chemistry develops to help improve bus efficiency/range and charging equipment becomes more sophisticated. Commitment to one form and brand of technology can have a detrimental impact to efficient operations and service as a whole, especially if significant advancements are assumed to be made.
4. Continue to maintain or increase the level of service throughout the ZEB transition. As outlined in the ICT regulation, CARB does not expect, recommend or require a transit agency to reduce service at the expense of completing the transition. If the transition costs or technology limitations result in service reductions, it would be counter-productive to greenhouse gas reduction by propelling transit riders to utilize personal vehicles and increase VMT's and overall emissions.

The transition to ZEB technologies represents a paradigm shift in bus procurement, operation, maintenance, and infrastructure. Technology requires significant development before it is ready to support fleetwide transitions. However, it is only through a continual process of deployment with specific goals for advancement that the industry can achieve the goal of economically sustainable, zero-emission public transit. Ultimately, the ZEB technology that is most efficient and sustainable to operate will evolve into either the majority ZEB solution or the only ZEB solution. MTS, with endorsement and approval from their Board of Directors, elected to pursue a mixed-use scenario that will allow them to initially deploy BEBs and explore possible opportunities and funding mechanisms to deploy FCEBs in service where BEBs are not able to meet range requirements. MTS will continue to monitor technology improvements and funding availability to accelerate the transition to a 100% zero-emission fleet. Evaluation will be completed in annual updates provided to the MTS Board of Directors and CARB.

Introduction

Founded in 1975, the San Diego Metropolitan Transit System (MTS) provides bus and light rail services to the urban areas of San Diego County and rural parts of East County, generating over 92 million passenger trips per year.

MTS engaged the Center for Transportation and the Environment (CTE) to perform a zero- emission bus (ZEB) transition study in March 2018. The study's goal was to create a plan for a 100% zero-emission fleet by 2040 to be in compliance with the Innovative Clean Transit regulation enacted by California Air Resources Board (CARB). The results of the study have been used to inform MTS Board members and educate MTS staff of estimated costs, benefits, constraints, and risks to guide future planning and decision making. In addition to the ZEB transition study, MTS initiated a pilot program to test ZEB technology in their service to better understand the technology and inform decision making.

In 2019, MTS installed six (6) 62.5- kilowatt (kW) ChargePoint vehicle chargers at the Imperial Avenue Division (Imperial Ave) and deployed six (6) 40-foot New Flyer battery-electric buses (BEBs). In 2020, MTS installed an additional two (2) ChargePoint chargers each at South Bay Bus Maintenance Facility (South Bay), Kearny Mesa Division (Kearney Mesa), and the East County Bus Maintenance Facility (East County) to facilitate BEB pilot operations throughout the service area. Two (2) 40-foot Gillig BEBs were deployed in early 2021 and later December 2021, five (5) additional Gillig BEBs were deployed. The pilot program ended shortly after that. In September 2023, MTS finished constructing an overhead gantry that includes twenty-four (24) Schunk pantographs which is powered by eight (8) Heliox 180kw charging cabinets at the South Bay Division. Shortly after the overhead structure was completed, twelve (12) 60-foot New Flyer BEBs were deployed to serve a dedicated route. Thirteen (13) BEBs were purchased in 2024 and will be delivered in Q2 2025.

Zero-emission technologies considered in this study update include BEBs and hydrogen fuel cell-electric buses (FCEBs). BEBs and FCEBs have similar electric drive systems that feature a traction motor powered by a battery. The primary difference between BEBs and FCEBs, however, is the amount of battery storage and how the batteries are recharged. The energy supply in a BEB comes from electricity provided by an external source, typically the local utility's grid, which is used to recharge the batteries. The energy supply for an FCEB is completely on-board, where hydrogen is converted to electricity using a fuel cell. The electricity from the fuel cell is used to recharge the batteries to extend the range. The electric drive components and energy source for a BEB and FCEB are illustrated in Figure 1.

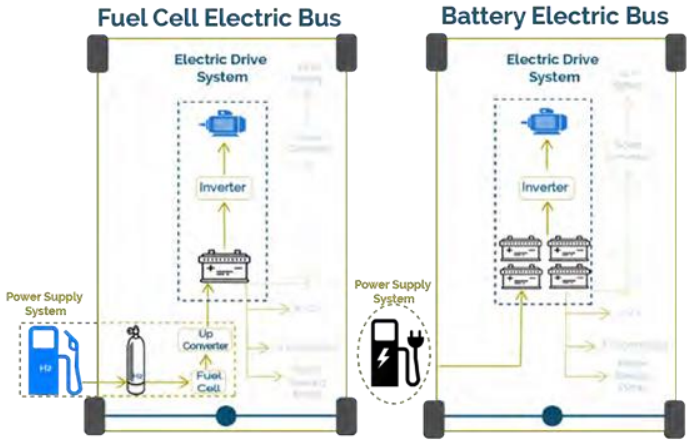


Figure 1 - Battery and Fuel Cell Electric Bus Schematic

CARB's Innovative Clean Transit Regulation

On December 14, 2018, CARB enacted the Innovative Clean Transit (ICT) regulation requiring all California public transit agencies with the statewide goal to gradually transition to a 100% ZEB fleet. The ruling specifies the timeline for the required annual percentage of new bus procurements that must be zero-emission, starting with 25% of new bus purchases in 2023 and ramping up to 100% of new bus purchases in 2029. This section summarizes key elements of the ICT.

ZEB Purchase Requirements

MTS' fleet exceeds 100 buses and, as such, is considered a "large" agency by CARB. All new bus purchases must include a specified percentage of ZEBs in accordance with the following schedule:

Starting January 1	Percent of New Bus Purchases
2023	25%
2024	25%
2025	25%
2026	50%
2027	50%
2028	50%
2029	100%

Table 1 – CARB Innovative Clean Transit (ICT) ZEB Transition Timeline.

Purchase of cutaway/minibus, over-the-road, double-decker, or articulated buses may be deferred until the latter of either January 1, 2026, or until a model of a given type has passed the "Altoona" bus testing procedure and obtained a Bus Testing Report. As of the date of this report, mostly heavy- duty 30', 35', 40' and 60' ZEBs and a few medium-duty ZEBs have passed Altoona bus testing.

ZEB Bonus Credits

ZEB Bonus Credits were earned by agencies that acquired ZEBs early and could have been used against future compliance requirements. To have earned bonus credits, ZEBs would have had to be placed into service according to the following schedule. Bonus credits expire December 31, 2028.

Technology	Placed in Service	ZEB Bonus Credit
BEB	As of January 1, 2018	1
FCEB	As of January 1, 2018	2
FCEB	January 1, 2018 to December 31, 2022	1

Table 2 - ZEB Bonus Credits Applied to CARB ICT Transition Schedule

ZEB Credits

Although MTS did not generate ZEB Bonus Credits to utilize toward compliance, ZEBs purchased in advance of the new purchase requirements may be used as credits toward annual ZEB

procurement compliance. As such, BEBs purchased in 2019 (6), 2020 (7), and 2021 (12) represent twenty-five (25) ZEB credits that may be applied toward purchase compliance with the ICT regulation in the early years of the transition. In February 2025, the MTS Board of Directors approved a request to CARB, utilizing seven (7) credits for FY25 bus purchases and thirteen (13) credits for FY26 bus purchases, both extinguishing the 25% ZEB requirement for those fiscal years. These developments have been incorporated into this analysis.

Exemptions

Agencies may request exemption from ZEB purchase requirements in a given year due to circumstances beyond the transit agency's control. Acceptable circumstances include:

- Delay in bus delivery is caused by the setback of construction schedule of infrastructure needed for the ZEB.
- Available depot-charged BEBs cannot meet a transit agency's daily mileage needs.
- Available ZEBs do not have adequate gradeability performance to meet the transit agency's daily needs
- When a required ZEB type for the applicable weight class based on gross vehicle weight rating (GVWR) is unavailable for purchase because the ZEB has not passed Altoona, cannot meet ADA requirements, or would violate any federal, state, or local regulations or ordinances.
- When a required ZEB type cannot be purchased by a transit agency due to financial hardship and the agency can demonstrate that they have applied for applicable ZEB funding mechanisms.

Reporting Requirements

Started on March 31, 2021, and continuing every year thereafter through March 31, 2050, each transit agency must submit an annual ICT ZEB compliance report by March 31 for the prior calendar year. The initial report was submitted on March 31, 2021, and included the number and information of active buses in the transit agency's fleet as of December 31, 2017.

ZEB Transition Planning

ZEB TRANSITION PLANNING METHODOLOGY

The 2020 study used CTE's ZEB Transition Planning Methodology, which was a complete set of analyses used to inform agencies in converting their fleets to zero-emission. The methodology consisted of data collection, analysis and assessment stages. The stages were sequential and were built upon findings in previous steps. The work steps specific to the 2020 study are outlined below:

1. Planning and Initiation
2. Requirements Analysis
3. Service Assessment
4. Fleet Assessment
5. Fuel Assessment
6. Facilities Assessment
7. Maintenance Assessment
8. Total Cost of Ownership Assessment

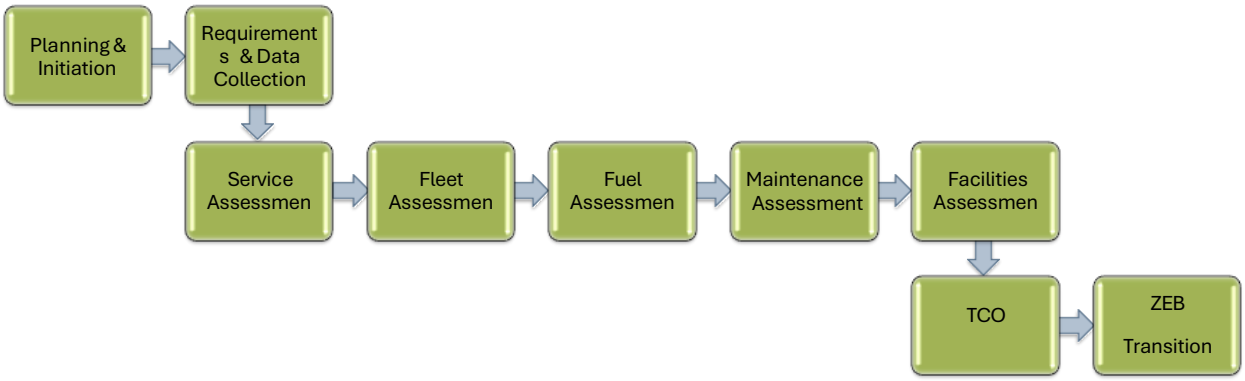


Figure 2 – CTE's ZEB Transition Study Methodology

The Planning and Initiation phase built the administrative framework for the transition study. During this phase, the project team drafted the scope, approach, tasks, assignments and timeline for the project. CTE worked with MTS staff to plan the overall project scope and all deliverables throughout the full life of the study. CTE conducted an "Assumptions Workshop" to start the Requirements & Data Collection phase. The assumptions collected during this phase provide key parameters used in each of the Assessment phases that follow. CTE collected fleet, operational, maintenance, and facilities information to define the "As Is" or baseline scenario. CTE also collected route and block mileage and duty cycle information as the basis for the Service Assessment.

During the Service Assessment, CTE worked with MTS staff to assess how MTS fleet vehicles are used and to identify service requirements. CTE leveraged several different tools and methods, including route modeling and simulation software, and empirically derived screening models based on real world operational data, to calculate expected energy efficiency, range, endurance, and energy consumption to identify any limitations or constraints to the application of electric

vehicle technologies. Results from modeling were used to estimate the achievability of every block in MTS' network using BEBs and FCEBs. The results from the Service Assessment were used to guide ZEB procurements in the Fleet Assessment and determine energy requirements (Depot Charging, On-Route Charging, and/or Hydrogen) in the Fuel Assessment. The Fleet Assessment developed a projected timeline for replacement of current buses with ZEBs that is consistent with the agency's Fiscal Year 2025 fleet replacement plan. This assessment also included a projection of fleet capital cost over the transition lifetime, and it can be optimized with regard to any state mandates, like CARB's ICT regulation, or to meet agency goals such as minimizing cost or maximizing service levels.

The Fuel Assessment merges the results of the Service Assessment and Fleet Assessment to determine annual fuel requirements and associated costs. The Fuel Assessment calculated energy costs through the full life of the transition for each scenario, including the agency's current internal combustion engine vehicles. To more accurately estimate BEB charging costs, a focused Charging Analysis was performed to simulate daily system-wide charging use. As current technologies are phased out in later years of the transition, the Fuel Assessment calculated the increasing energy requirements for ZEBs. The Fuel Assessment also provided a total energy cost over the transition lifetime.

The Facilities Assessment determined the necessary infrastructure to support the projected zero-emission fleet based on results from the Fleet Assessment and Fuel Assessment. The result showed quantities of hydrogen and battery electric infrastructure and calculates associated costs.

The Maintenance Assessment calculated all projected fleet maintenance costs over the life of the project. This included costs related to existing internal combustion engine vehicles remaining in the fleet, as well as new BEBs and FCEBs, calculated for each scenario.

The Total Cost of Ownership Assessment compiled results from the previous assessment stages and provided a comprehensive view of all associated costs, over the transition lifetime.

Requirements Analysis

BASELINE DATA COLLECTION

It is essential to understand the key elements of MTS' service to evaluate the costs associated with a full-ZEB transition. Key data elements of the current MTS service were compiled and included the following:

- Fleet composition
- Routes and blocks
- Mileage and fuel consumption
- Maintenance costs

At the time of this study update, the MTS bus fleet totaled 753 vehicles that provide service on nearly 100 fixed routes with additional, complementary, on-demand paratransit service. A breakdown of size and fuel type is shown in Table 3 and Table 4. Bus services operate out of five divisions, all of which include operations, maintenance and fueling functions: Imperial Avenue Division (Imperial Ave), Kearney Mesa Division (Kearney Mesa); South Bay Bus Maintenance Facility (South Bay); East County Bus Maintenance Facility (East County); and Copley Park Maintenance Facility (Copley). MTS' fixed route minibuses and on-demand paratransit buses operate from Copley.

Division	Bus Length [ft]				Totals
	22, 29, 32	40	45	60	
Copley	149	0	0	0	149
East County	3	69	24	0	96
Kearny Mesa	0	71	0	42	113
Imperial Ave	0	99	0	44	143
South Bay	0	213	0	39	252
Totals	**152**	**452**	**24**	**125**	**753**

Table 3 - Fleet Breakdown by Division and Length

Division	Fuel Type					Totals
	CNG	Diesel	Propane	Gasoline	Electric	
Copley	0	0	135	14	0	149
East County	91	0	0	3	2	96
Kearny Mesa	111	0	0	0	2	113
Imperial Ave	136	0	0	0	7	143
South Bay	238	0	0	0	14	252
Totals	**576**	**0**	**135**	**17**	**25**	**753**

Table 4 - Fleet Breakdown by Division and Fuel Type

2025 Transition Plan Blocks (WK, SAT, & SUN)					
Division	Bus Length [ft]				Totals
	22, 29, 32	40	45	60	
Copley	40	0	0	0	**40**
East County	6	86	16	0	**108**
Kearny Mesa	0	137	0	74	**211**
Imperial Ave	0	170	0	87	**257**
South Bay	0	344	0	102	**446**
Totals	**46**	**737**	**16**	**263**	**1062**

Table 5 - Count of Blocks by Division and Bus Length

2025 Transition Plan Annual Total Miles (WK, SAT, SUN)					
Division	Bus Length [ft]				Totals
	22, 29, 32	40	45	60	
Copley	4,586,497.78	-	-	-	**4,586,497.78**
East County	860,991.75	2,331,969.89	472,938.47	-	**3,665,900.10**
Kearny Mesa	-	2,610,694.25	-	2,490,574.70	**5,101,268.95**
Imperial Ave	-	3,718,765.04	-	1,463,881.90	**5,182,646.94**
South Bay	-	7,666,018.00	-	1,737,382.05	**9,403,400.05**
Totals	**5,447,489.53**	**16,327,447.17**	**472,938.47**	**5,691,838.65**	**27,939,713.81**

Table 6 – Annual Total Miles by Division and Bus Length

Division	Bus Length [ft]				Totals
	22, 29, 32	40	45	60	
Copley	-	-	-	-	**-**
East County	-	1,111,574	386,634	-	**1,498,208**
Kearny Mesa	-	1,143,793	-	676,610	**1,820,403**
Imperial Ave	-	1,594,866	-	708,830	**2,303,696**
South Bay	-	3,431,379	-	628,281	**4,059,660**
Totals	**-**	**7,281,612**	**386,634**	**2,013,720**	**9,681,967**

Table 7 - Annual CNG Fuel Consumption by Division and Bus Length (Therms)

Division	Bus Length [ft]				Totals
	22, 29, 32	40	45	60	
Copley	535,643.31	-	-	-	**535,643.31**
East County	1,286.21	-	-	-	**1,286.21**
Kearny Mesa	-	-	-	-	**-**
Imperial Ave	-	-	-	-	**-**
South Bay	-	-	-	-	**-**
Totals	**536,929.52**	**-**	**-**	**-**	**536,929.52**

Table 8 - Annual Diesel, Gasoline, and Propane Fuel Consumption by Division and Bus Length (DGE)

Service Assessment

Bus efficiency and range are primarily driven by vehicle specifications; however, it can be impacted by a number of variables including the route profile (i.e., distance, dwell time, acceleration, sustained top speed over distance, average speed, traffic conditions, etc.), topography (i.e., grades), climate (i.e., temperature), driver behavior, and operational conditions such as passenger loads and auxiliary loads. As such, BEB efficiency and range can vary dramatically from one agency to another. Therefore, it is critical to determine efficiency and range estimates that are based on an accurate representation of the operating conditions associated with MTS' system to complete the assessment.

At the time of this plan update, MTS's average BEB fleet efficiency is 2.8 kWh/mile which encompasses thirteen (13) 40' BEBs and twelve (12) 60' BEBs. Average efficiency for the 40' BEBs is approximately 2.4 kWh per mile with an estimated range of 148 miles for a single charge. The 60' BEB's average efficiency is approximately 3.4 kWh per mile with an estimated range of 144 miles. The estimated fleet range is 147 miles. It is important to note that the fleetwide efficiency fluctuates, which causes the range to fluctuate on a month-to-month basis. Figure 3 below shows the average range of the BEB Fleet by OEM.

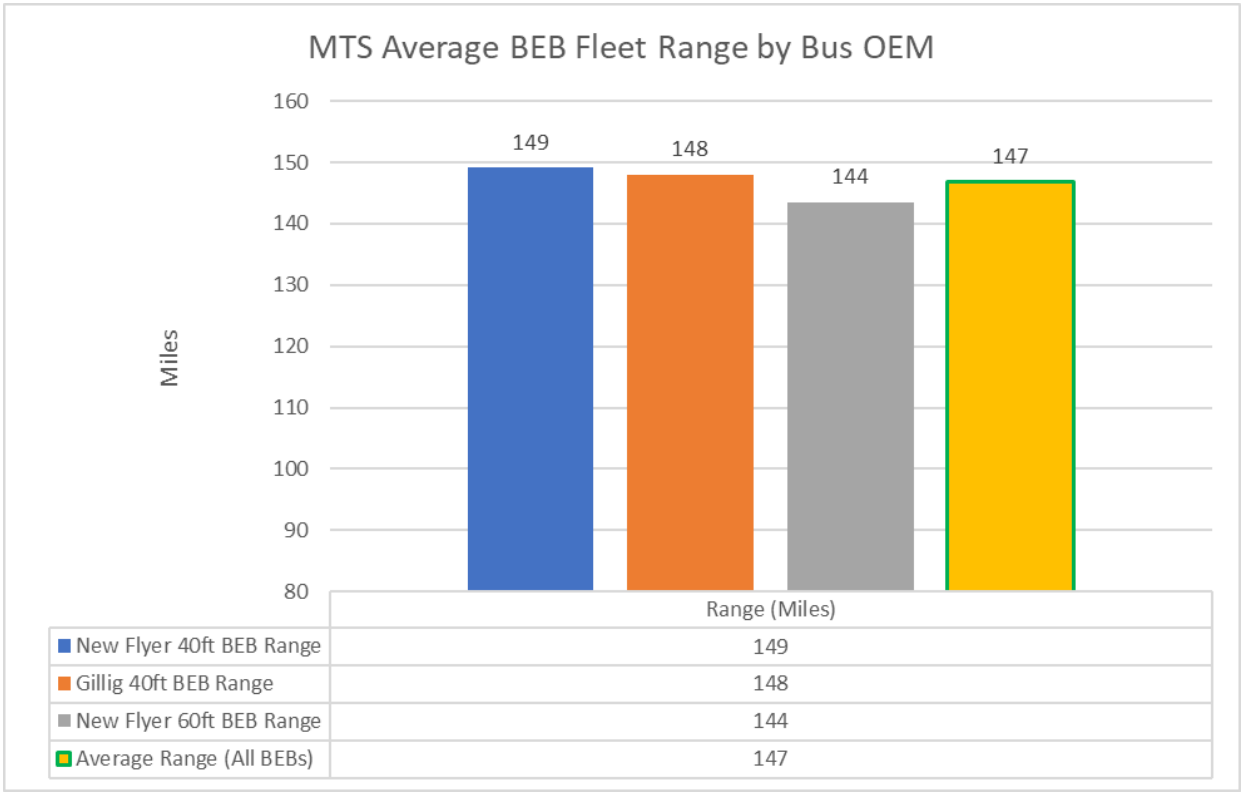


Figure 3 – Average BEB Fleet Range by Bus OEM

Despite the average fleet range of the BEBs being estimated 147 miles, MTS, assigns BEBs to blocks that are 130 miles and less, utilizing approximately 80% of the battery. As a result, 48% of MTS's total blocks are capable of being operated by a BEB. Figure 4 below shows a graph of block assignments with BEB Mileage Range.

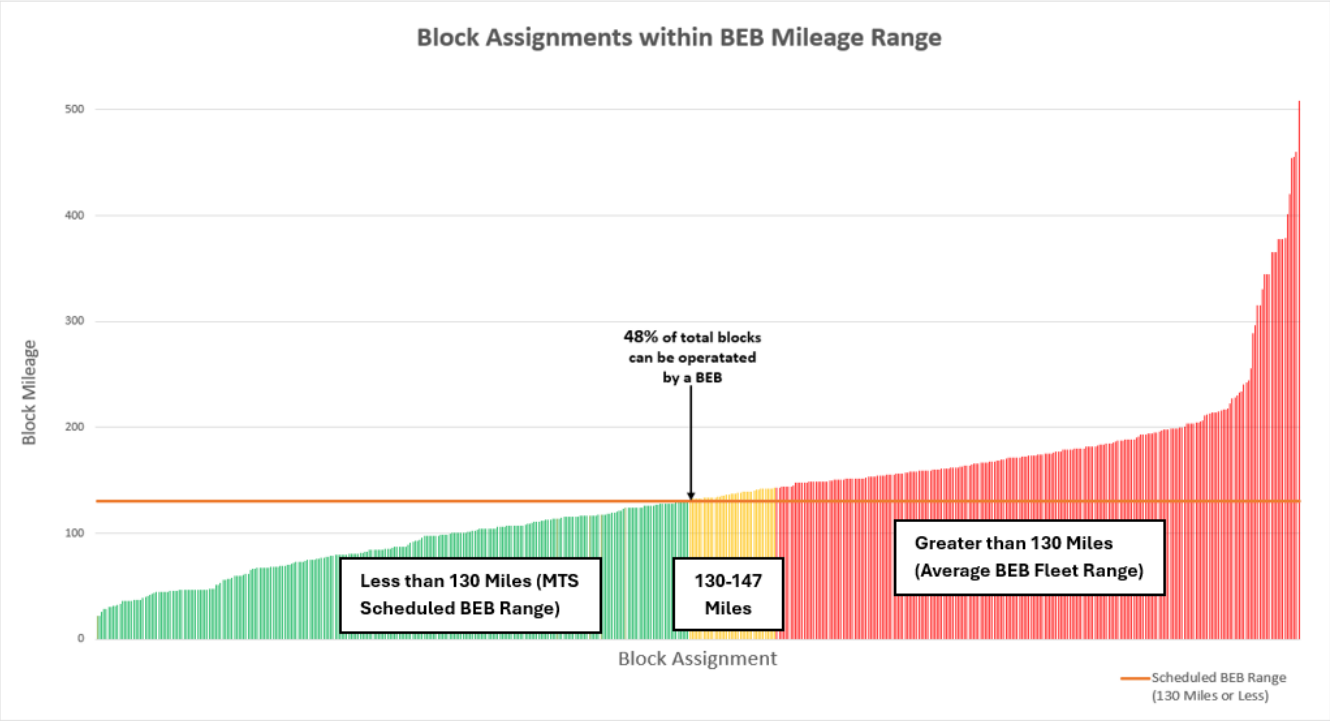


Figure 4 – Block Assignments within BEB Mileage Range

While routes and block schedules are unlikely to remain the same over the course of the transition period, these projections assume the blocks will retain a similar structure to what is in place today. Despite changes over time, this analysis assumes blocks will maintain a similar distribution of distance, relative speeds, and elevation changes by covering similar locations within the city and using similar roads to get to these destinations. This core assumption affects energy use estimates as well as block achievability in each year.

It should be noted that BEB range is negatively impacted by battery degradation over time. A BEB may be placed in service on a given block with beginning-of-life batteries; however, it may not be able to complete the entire block at some point in the future before the batteries at are end-of-life (typically considered 80% of available service energy). Conceptually, older buses can be moved to shorter, less demanding blocks and newer buses can be assigned to longer, more demanding blocks. MTS can rotate the fleet to meet the demand assuming there is a steady procurement of BEBs each year to match service requirements. This could also be said for FCEBs, although the impact of degradation is assumed to be less. MTS could also consider a midlife replacement of batteries that cannot meet the service needs due to degradation. Those costs are relatively unknown right now and are not included in the current cost per mile projections through the transition.

Battery density for electric vehicles has made significant improvements each year. For the purposes of this study, considering the extended period of a complete fleet transition (e.g. through 2040), it is assumed a 5% improvement will be made every two years. If the trend continues, it is expected that buses may continue to improve their ability to carry more energy without a weight penalty or reduction in passenger capacity. Over time, BEBs are expected to approach the capability to replace all of an agency's internal combustion engine buses one-for-one. FCEBs do not have the same range constraints as BEBs. Typically, FCEBs can more readily serve an agency's current blocks on a one-to-one basis with internal combustion engine buses. An FCEB's range is estimated to be between 250 to 300 miles. Most MTS blocks could run on a FCEB, but not all as there are some blocks that are beyond its maximum range which do not make replacement of all internal combustion engine buses completely one-to-one. Additionally, the costs of hydrogen fuel and bus capital costs can create higher barriers to entry. There is also a significant amount of research going towards fuel cell technologies. We assume 5% bi-annual improvement in hydrogen tank size as a proxy for other component improvements such as battery capacity, motor efficiency, fuel cell efficiency, etc.

The block analysis, with the assumption of 5% improvement in battery capacity or improvement in hydrogen storage capacity every other year, is used to determine the timeline for when routes and blocks become achievable for BEBs and FCEBs, respectively, to replace internal combustion engine buses one-for-one. This information is used to then inform ZEB procurements in the Fleet Assessment. The results from the block analysis are used to determine when/if a full transition to BEBs or FCEBs may be feasible. Results from this analysis are also used to determine the specific energy requirements and develop the estimated costs to operate the ZEBs in the Fuel Assessment.

Results from the block analysis that indicate the yearly block achievability by bus length throughout the transition period for BEBs and FCEBs are included in Figure 5 and Figure 6 below, respectively.

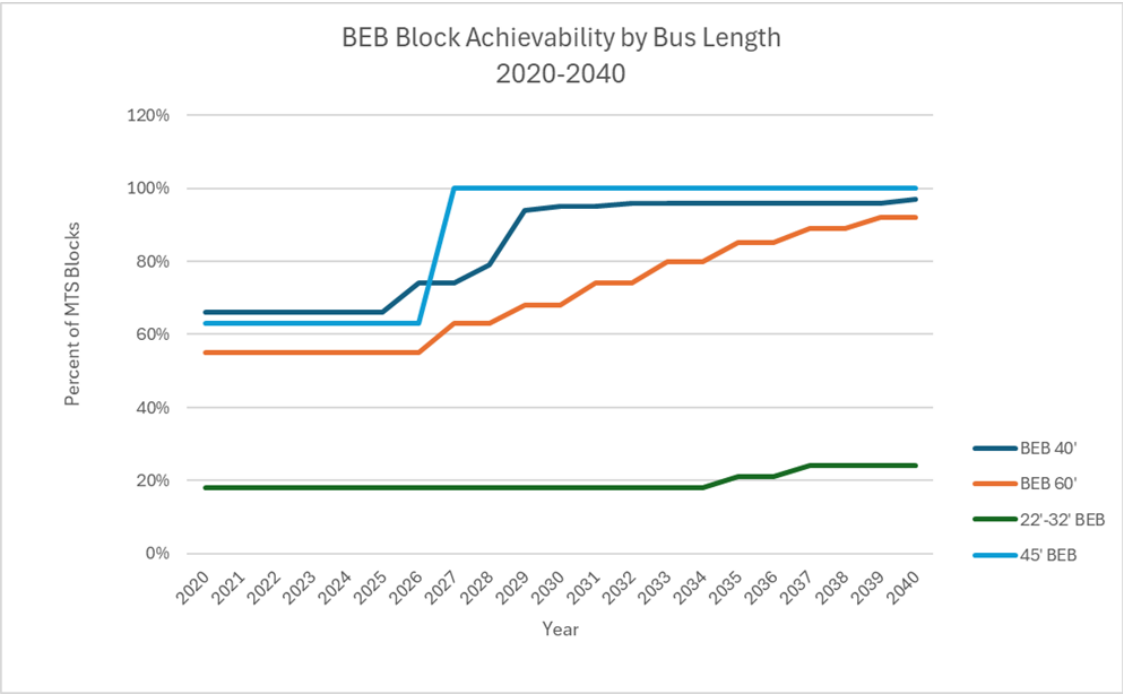


Figure 5 – BEB and MTS Block Achievability

The BEB achievability in Figure 5 shows that by 2040, it is expected that nearly all 40', 45', and 60' MTS blocks can be completed by BEBs. However, in 2040, cutaway blocks (22'-32') struggle, with only approximately 24% able to be completed by BEBs, respectively.

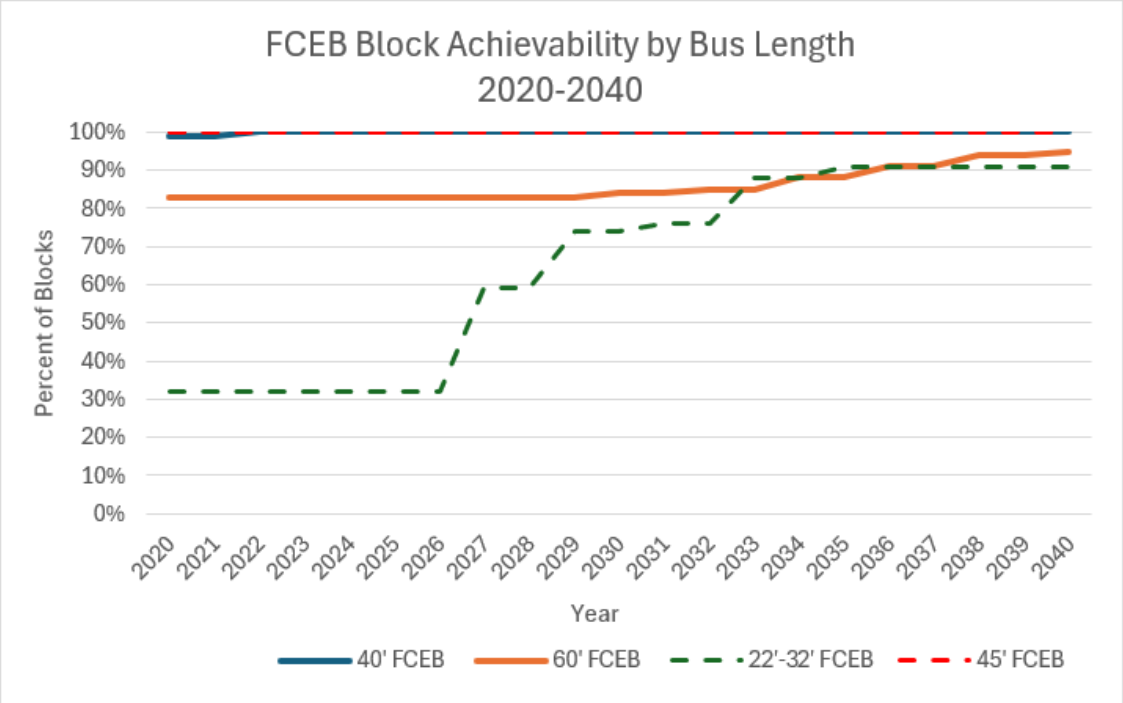


Figure 6 – FCEB and MTS Block Achievability

The FCEB achievability in Figure 6 shows that by 2040, it is expected that 98% of MTS blocks can be completed by FCEBs. It is predicted that with the exception of cutaway buses (22'-32'), all other FCEB sizes can complete 96% or greater of MTS blocks starting in 2025. Please note that the dashed lines indicate that, at the time of the study, there are no 45'or cutaway FCEBs available on the market that have completed Altoona testing and the timeline for these to be available is uncertain.

Fleet Assessment

The goal of the Fleet Assessment is to determine the type and quantity of ZEBs, as well as the schedule and cost to transition the fleet to zero-emissions. Results from the Service Assessment are integrated with MTS' current fleet replacement plan and purchase schedule to produce two main outputs: a projected bus replacement timeline through the end of the projection period, and the associated total capital costs. While the industry is rapidly changing, there are still tradeoffs for each zero-emission technology, primarily between range, operational impact, capital costs and operating costs.

Cost Assumptions

In the 2020 study, CTE and MTS developed cost assumptions for this analysis for each bus length and technology type (e.g. CNG, gasoline, propane, BEB, FCEB). Key assumptions for the updated 2025 bus costs for the MTS Transition Study Update are as follows:

- Bus costs are based on MTS procurements, industry quotes, and the State of California statewide procurement contract for BEBs and FCEBs executed in 2024.
- Bus costs are inclusive of configurable options and taxes.
- Bus costs are estimated where buses of a given configuration are not commercially available or where no quotes were available.
- Future bus costs incorporate inflation escalation.

Conventional wisdom dictates that the costs of BEBs will decrease over time due to higher production volume and competition from new vendors entering the market. While initially this was true, costs have increased in recent years. However, it should be also noted that vendors have added more battery storage since the completion of the 2020 study. Table 9 provides estimated bus costs used in the analysis.

Length [ft]	CNG	Diesel	Gasoline	Propane	Electric	Hydrogen
22' Cutaway	-	-	$99,200	$136,400	$310,000	*$465,000*
29' Cutaway	-	-	$186,000	-	*$403,000*	*$603,880*
32' Cutaway	-	-	-	$219,480	*$403,000*	*$604,500*
40'	$681,953	-	-	-	$1,195,539	$1,422,919
45'	$992,000	$868,000	-	-	*$1,178,000*	*$1,736,000*
60'	$1,244,173	-	-	-	$1,704,173	$2,022,767

Note: Italic text indicates that the cost was an estimate based on similar vehicle costs

Table 9 – Fleet Assessment Cost Assumptions

Baseline

The Baseline scenario was used for comparative purposes only. It assumed no changes to MTS' current fleet composition throughout the life of the 2025 study update. The Baseline scenario created context for incremental costs incurred or benefits accrued by transitioning the fleet to zero- emission.

Figure 7 presents the number of each bus type that is purchased each year to maintain MTS' current fleet composition through 2040. The number of buses purchased each year is based on the Fiscal Year 2025 MTS vehicle replacement schedule.

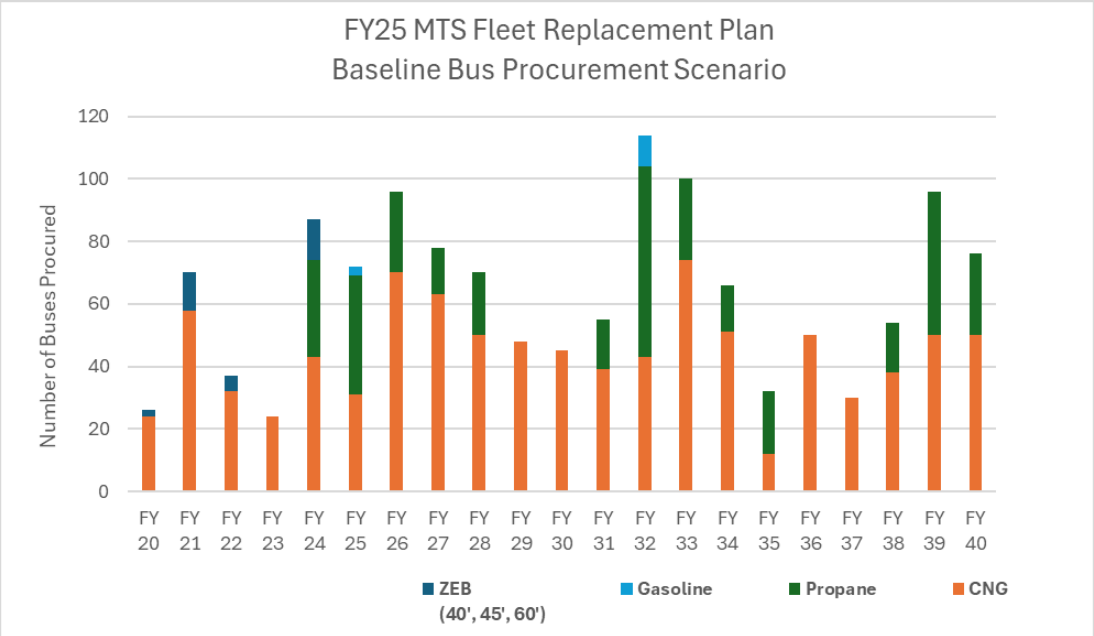


Figure 7 – Projected Vehicle Purchases, Baseline Scenario

Figure 8 shows the annual capital costs based on the purchase schedule and bus cost assumptions for the Baseline Scenario. Total bus purchases range from approximately $20 to $100 million each year.

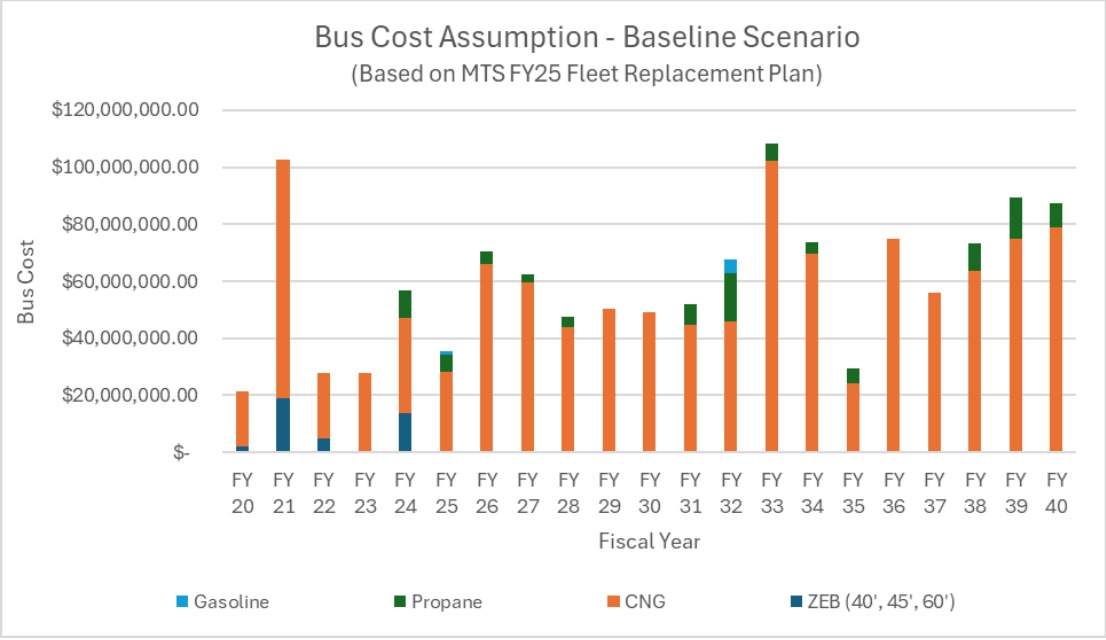


Figure 8 – Annual Bus Costs, Baseline

MIXED BEB AND FCEB

In the Mixed BEB and FCEB approach, depot-charged BEBs are utilized where they can replace internal combustion engine buses on a one-for-one basis. Since FCEBs have a greater range, they would be used on the longer blocks and in Paratransit service where BEBs are not feasible. By the end of the transition period, any instance where block coverage is insufficient, a FCEB is used to replace MTS' original vehicle type. The figures below show projected purchases, annual fleet composition, and annual total capital costs for the Mixed BEB and FCEB fleet. By 2040, MTS will be able to replace approximately 99% of its fleet with BEB and FCEBs. The remaining 1% of vehicles will be replaced with FCEBs when they reach their useful life after 2040. There is a lag between when ZEB technology can meet block energy requirements and when a vehicle is replaced due to the vehicle replacement schedule.

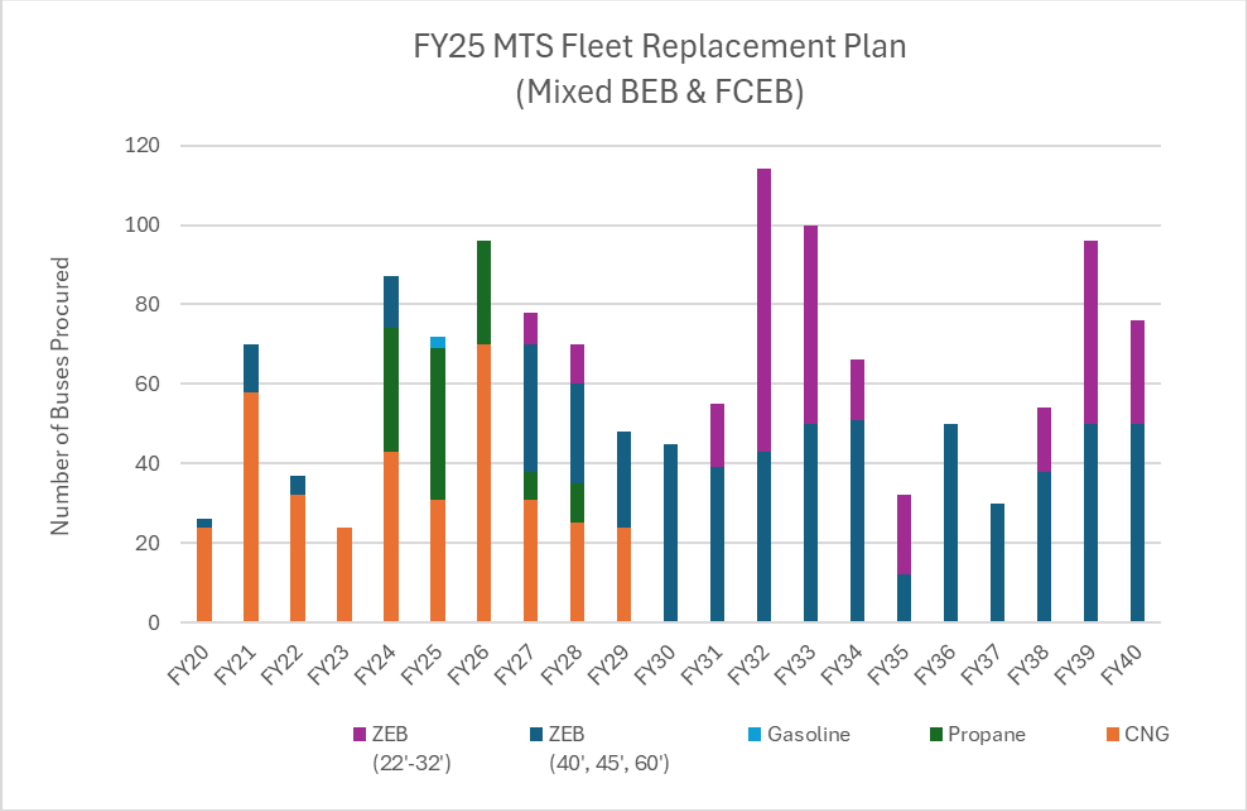


Figure 9 – Projected Vehicle Purchases, Mixed BEB & FCEB

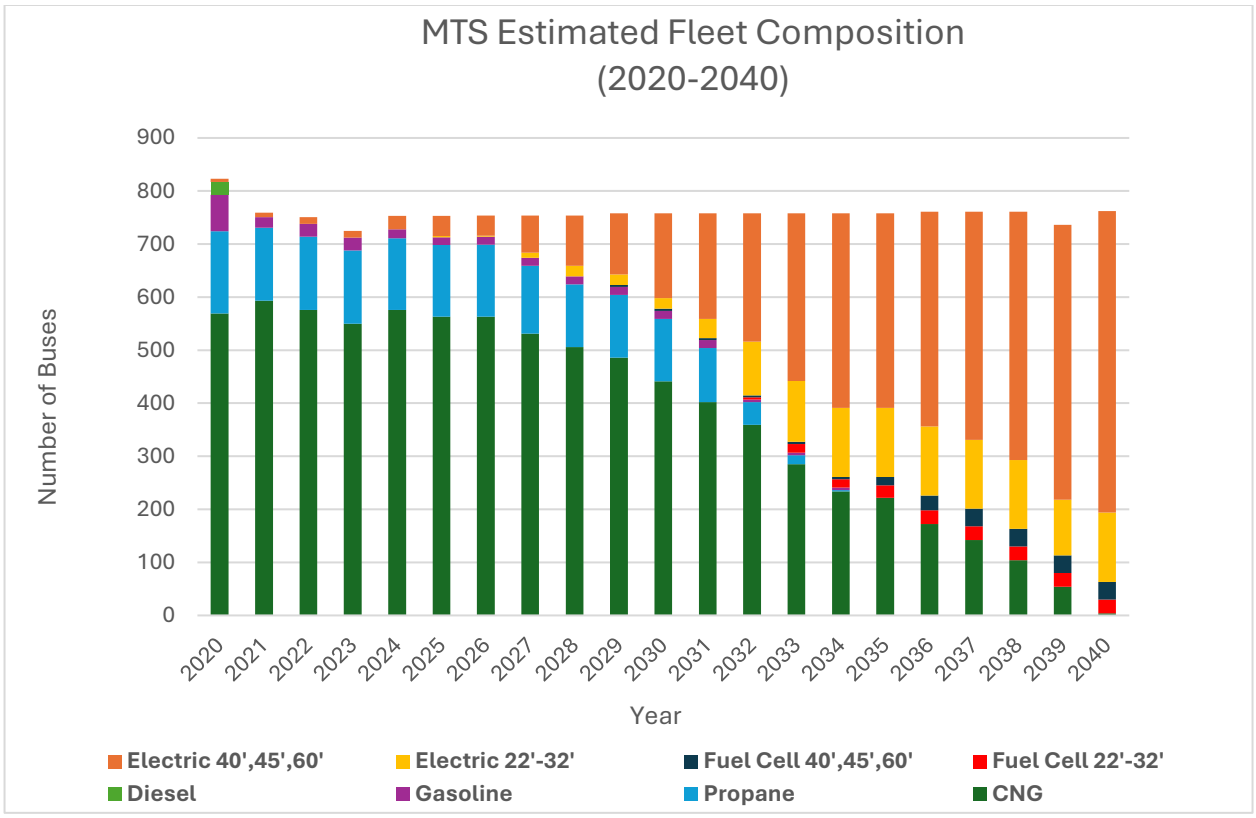


Figure 10 – Annual Fleet Composition, Mixed BEB & FCEB

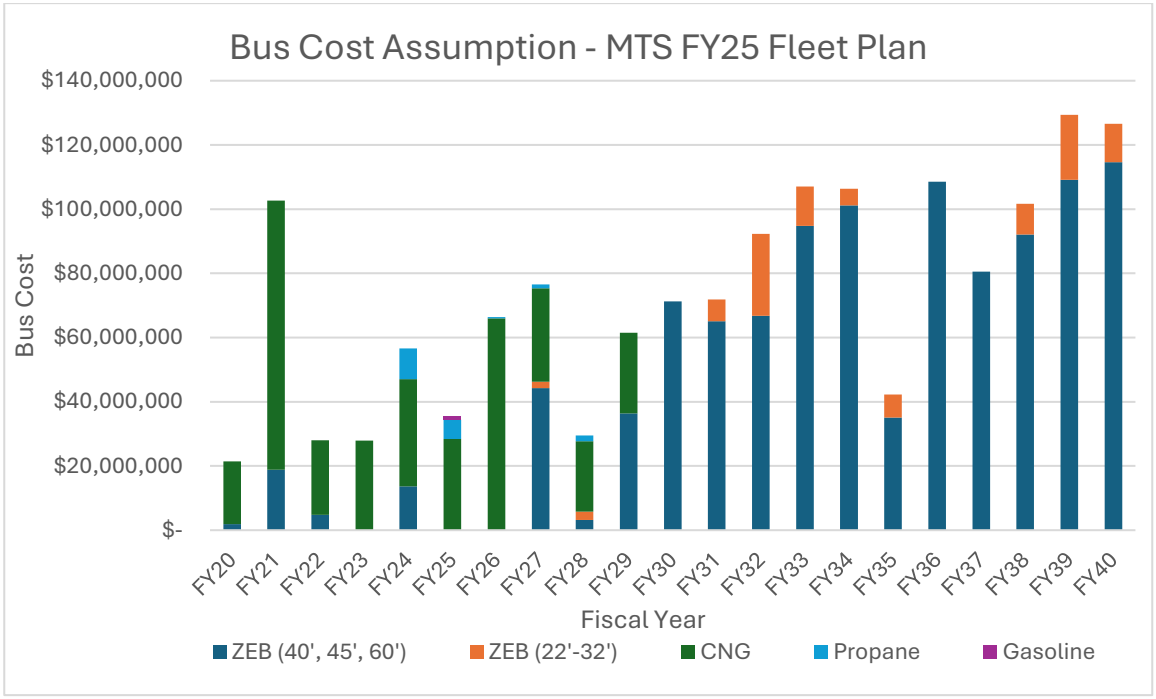


Figure 11 - Annual Bus Costs, Mixed BEB & FCEB

Fleet Assessment Cost Comparison

The transition and fleet composition schedules were used to develop the total capital cost for vehicle purchases through the transition period. Figure 12 shows the cumulative fleet purchase costs for both scenarios.

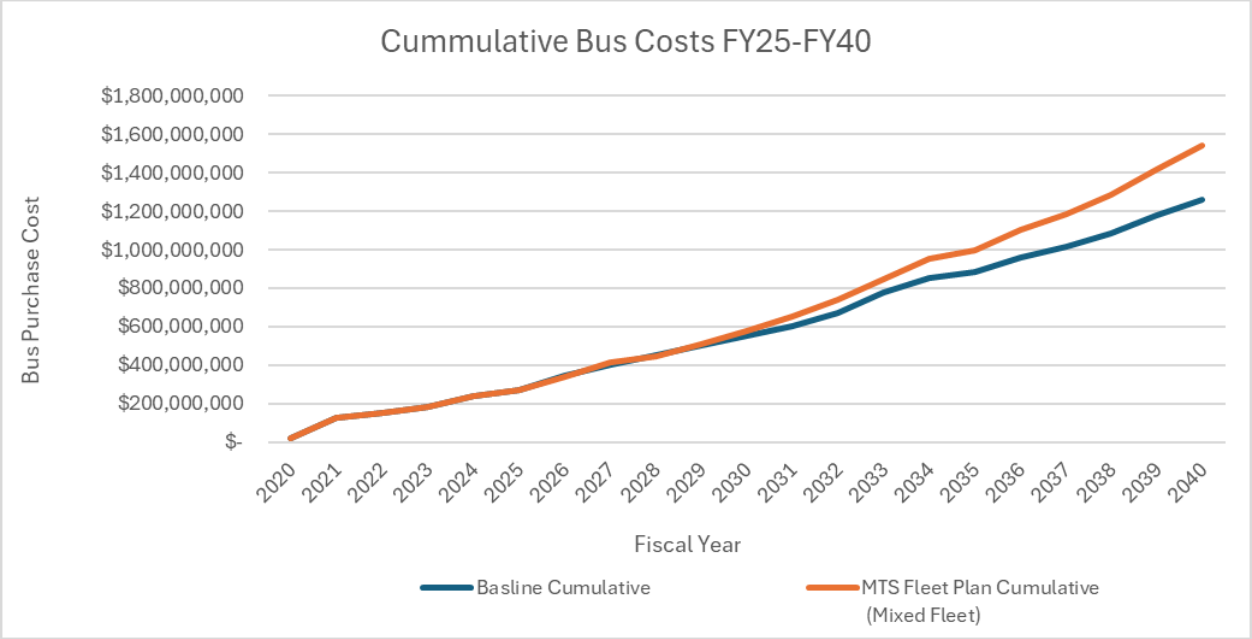


Figure 12 – Cumulative Fleet Purchase Costs

Table 10 provides the combined total costs for each transition scenario

Scenario	Cost
Baseline	$ 1,263,176,641
Mixed BEB & FCEB	$ 1,543,816,833

Table 10 – Total Costs, Fleet Assessment

Fuel Assessment

The Fuel Assessment estimates quantities and costs for MTS' current and future internal combustion engine vehicles as well as electrical energy and hydrogen fuel quantities and costs for the future BEB and FCEBs. The terms "fuel" and "energy" are used interchangeably in this assessment, as ZEB technologies do not always require traditional liquid fuel. For clarity, in the case of BEBs, "fuel" is electricity and costs include energy, demand and other utility charges. FCEBs are more similar to internal combustion engine vehicles as they are fueled by gaseous or liquid hydrogen fuel. In addition to the cost of the fuel itself, however, there are additional operational costs associated with the hydrogen fueling station that must be considered. Fuel cost estimates are based on the assumptions shown in Table 11 below.

Fuel	Cost	Source
Gasoline	$3.85/gal	MTS contracted rate
Propane	1.94/gal	MTS contracted rate
CNG	$1.00/DGE	MTS contracted rate
Hydrogen (trucked)	$25.00/kg	Average of contracted rates for multiple CA transit agencies/recent baseline quotes from area suppliers
Electricity	Varies	SDG&E AL-TOU and EV-HP Tariff Schedules

Table 11 - Fuel Cost Assumptions

The primary source of energy for a BEB comes from the local electrical grid. Utility companies typically charge separate rates for total electrical energy used and the maximum electrical demand on a monthly basis. As more buses and chargers are added to the system, both the energy used and the demand increase. Rates also vary throughout the year and throughout the day; this makes costs highly variable. Costs not only depend on seasonal differences like temperature, but also the time-of-day buses are charged. Table 12 shows the current San Diego Gas & Electric (SDG&E) rate schedule used in the Fleet Assessment to estimate electrical costs for BEBs.

SDG&E Energy Rates		
Time-of-Use (TOU)	**Rate/kWh**	**Hours**
Off-Peak	$0.12	6:00am - 4:00pm
On-Peak	$0.29	4:00pm - 9:00pm
Off-Peak	$0.12	9:00pm - 12:00am
Super Off-Peak	$0.10	12:00am - 6:00am

Table 12 – Time-of-Use Energy Rates

Charging Analysis

To accurately estimate energy use and electrical demand, and subsequent costs, due to BEB charging, charging was simulated at each depot, for each year of the transition. Electrical energy and demand were estimated based on current block schedules and BEB purchase projections and apply SDG&E tariff schedules to calculate an annual cost of charging. This annual cost is evaluated for each year of the study and at each depot to obtain a total BEB depot charging cost for the transition. This estimate is used as the total "fuel" cost for BEB depot charging in the subsequent Mixed BEB & FCEB approach assessment and it is incremental hydrogen fuel costs and internal combustion engine costs.

Figure 13 shows the estimated annual BEB depot charging costs. These costs are inclusive of all divisions. The following assumptions were considered while determining the annual costs:

- 80% percent of BEB batteries are charged daily.
- 180 kW chargers and dispensers utilized
- As BEBs continue to be delivered to divisions, BEBs are deployed, they are prioritized/assigned to blocks that pull-in outside of the on-peak charging window.
- Increased bi-annual on-board battery capacity on newly delivered BEBs.
- All blocks that pull-in during the on-peak begin charging during the on-peak window instead of after 9pm.

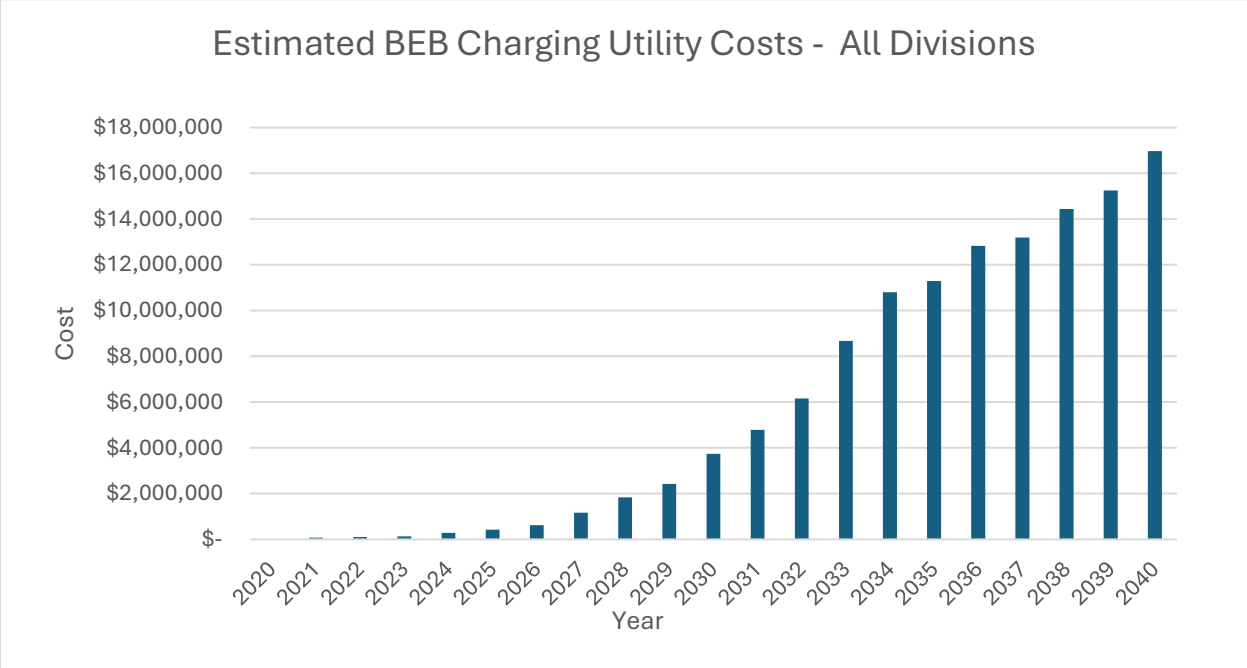


Figure 13 – Estimated Annual BEB Depot Charging Costs

Baseline

The Baseline scenario is comparative purposes only and assumes that there is no change in the current MTS fleet configuration throughout the life of the study. The Baseline scenario helps create

context for incremental costs incurred or benefits accrued by transitioning the fleet to zero-emission.

Figure 14, below, depicts energy consumption for each fuel type over the transition period for the Baseline scenario. Fuel use is shown in diesel gallon equivalent (DGE) for all fuel types. It is assumed that the fuel economy for MTS' internal combustion engine vehicles remain constant over the study life.

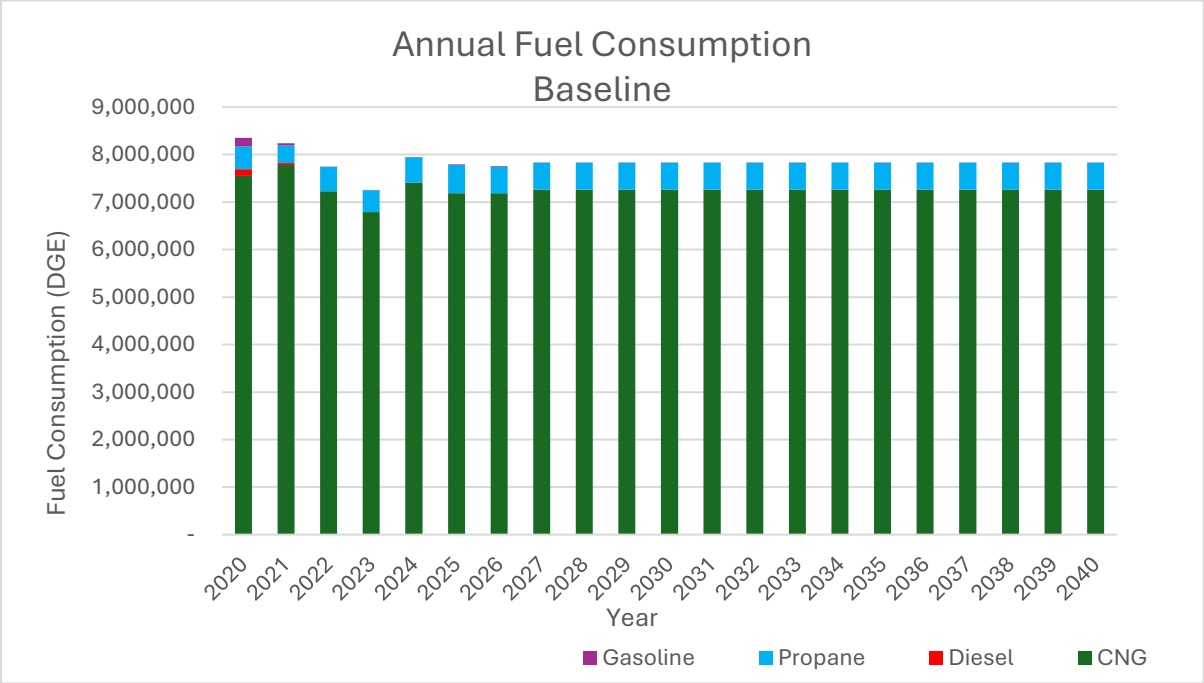


Figure 14 – Annual Fuel Consumption, Baseline

Figure 15 shows the calculated annual costs for each fuel type based on the quantities for the Baseline scenario.

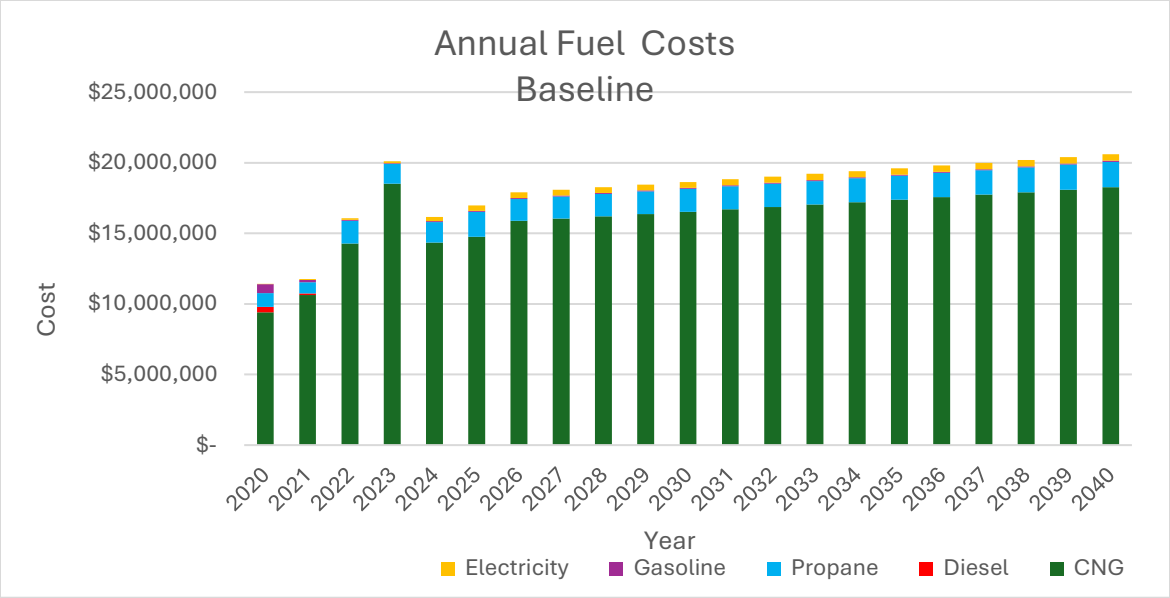


Figure 15 – Annual Fuel Costs, Baseline

MIXED BEB AND FCEB

In the Mixed BEB and FCEB approach, BEBs are utilized where they can replace internal combustion engine vehicles on a one-for-one basis. Since FCEBs have a greater range, they are used on the longer blocks where BEBs are not feasible. Figure 16 depicts the reduction of energy consumption for legacy fuels over the transition period for the Mixed BEB and FCEB approach. Legacy fuels are phased out as electricity and hydrogen consumption increases, reflecting an increasing number of BEBs and FCEBs in the fleet.

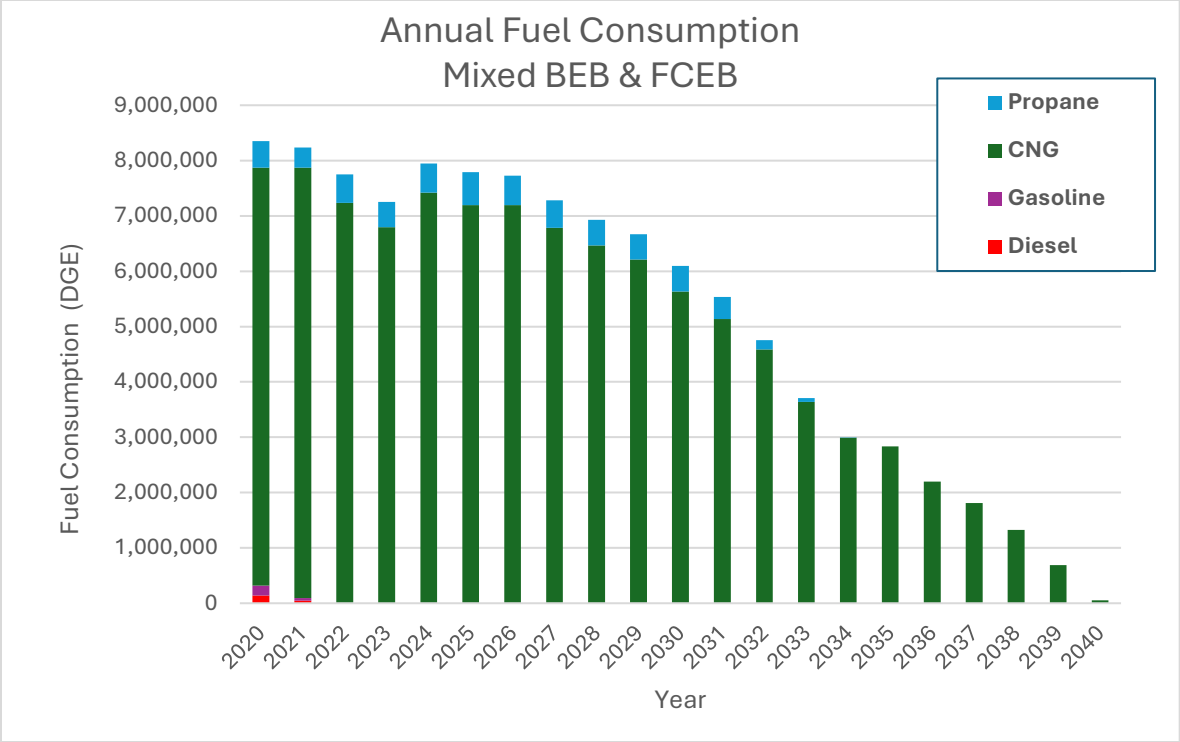


Figure 16 – Annual Fuel Consumption, Mixed BEB & FCEB

Figure 17 shows the estimated annual costs for each fuel type. Total estimated fuel costs in 2040 are approximately $30 million, which consists of electricity use for BEBs and hydrogen fuel.

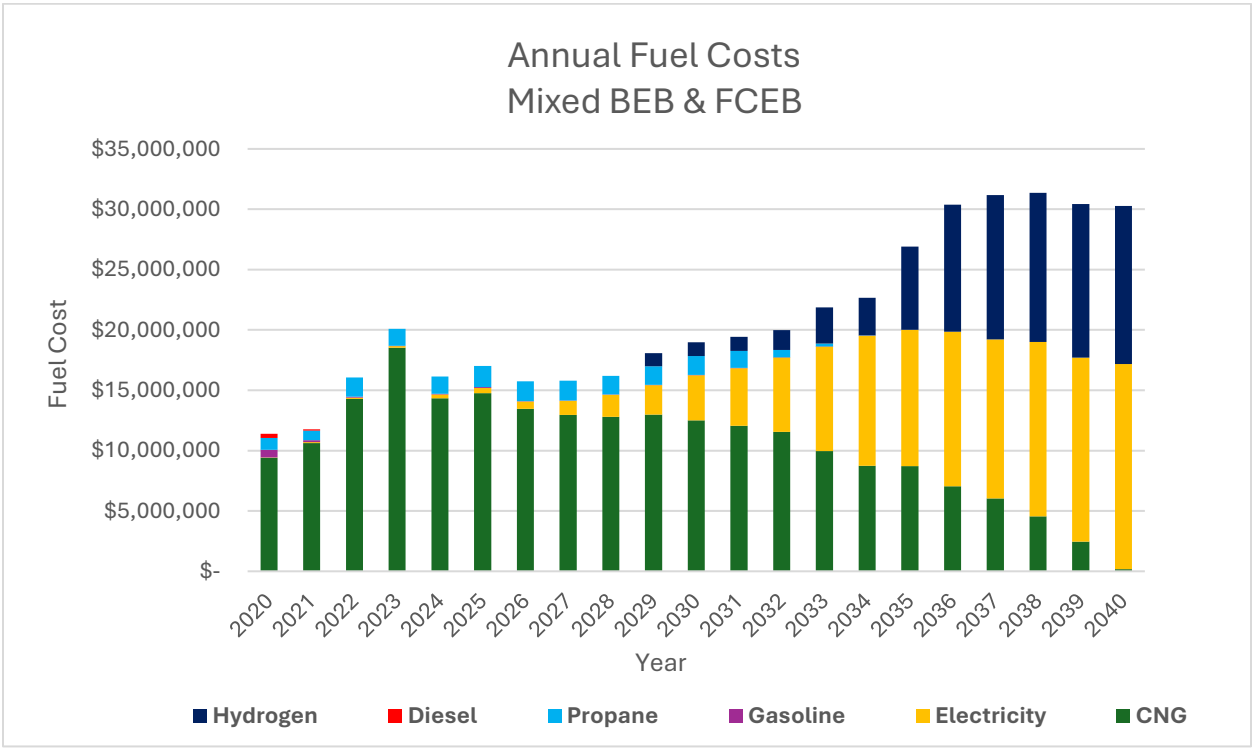


Figure 17 – Annual Fuel Costs, Mixed BEB & FCEB

Fuel Assessment Cost Comparison

The Fuel Assessment includes all electrical and fuel costs over the transition for each scenario. Figure 18 shows the cumulative fuel costs for the Baseline and Mixed BEB & FCEB approach. Table 13 shows the combined total costs, the incremental cost over the Baseline.

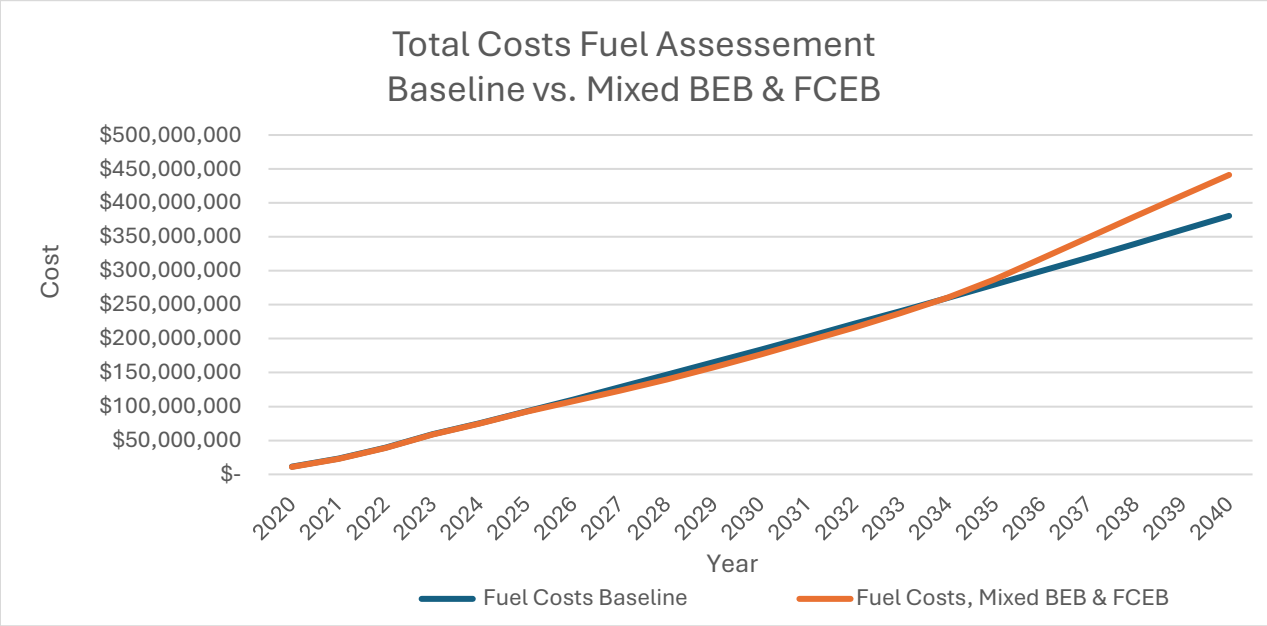


Figure 18 – Total Costs Fuel Assessment

Scenario	Cost
Baseline	$ 380,886,640
Mixed BEB & FCEB	$ 441,231,673

Table 13 – Total Costs, Fuel Assessment

Facilities Assessment

The Facilities Assessment determines the scale of charging and/or hydrogen infrastructure necessary to meet the demands of the projected fleets' energy use estimated in the Fleet and Fuel Assessments, as well as all associated costs with installation of this infrastructure.

Baseline

For the Baseline scenario, there are no additional costs associated with ZEB infrastructure because no ZEBs are added to the fleet. Although a total of thirteen (13) BEBs are scheduled to be added to the fleet in Q3 2025, these buses were already considered part of the baseline analysis as the infrastructure costs have already been programmed. No additional fueling infrastructure upgrades are required to support the Baseline scenario.

Battery-Electric Charging Infrastructure

During the BEB Pilot Program, it was realized that scaling a fleetwide BEB deployment required a different approach rather than utilizing plug-in charging. Plug-in charging was no longer practical as charger dispenser cables can create hazards in the bus yard. Instead, the preferred approach was determined to use overhead pantograph dispensers attached to gantries installed above bus parking lanes. Overhead plug-in reels could be utilized at East County for the 45' commuter bus fleet primarily because of these bus types with pantograph compatibility does not exist yet at the time of this plan update.

In addition to the installation of the charging stations, improvements to existing electrical infrastructure including switchgear, service connections, etc. are required to support deployment of BEBs. Design work will be required to support BEB deployment including development of detailed electrical and construction drawings required for permitting once specific charging equipment has been selected. Rather than building out the infrastructure all at once, projects are sized and scheduled to meet the near-term charging requirements. Charging infrastructure to support 699 depot-charged BEBs in 2040 is required, as calculated in the Fleet Assessment. Key assumptions include:

- Gantry structures are used at each division except for Copley Division as depot plug-in charging will be utilized with cutaway vehicles.
- One (1) overhead pantograph per bus for 40' and 60' BEBs.
- Overhead reel plug-ins for 45' BEB at East County Division
- Three (3) buses per 180 kW charger except at Copley Division.

Depot Planning Projects

The build-out of charging and hydrogen infrastructure will require planning at each division. Planning is assumed to cost approximately $150,000 for each division. At the time of this plan update, division master plans have been completed for South Bay, Imperial Avenue, and Kearny Mesa. East County is currently in development and Copley will be planned in future years. The table below shows past and upcoming planning projects at each division. At the time of this plan update, there is no FCEB infrastructure in place.

ZEB Planning Projects						
Year	**Copely**	**EC**	**SB**	**IAD**	**KMD**	**All Divisions**
2020			1			**1**
2021						**0**
2022				1		**1**
2023						**0**
2024					1	**1**
2025		1				**1**
2026						**0**
2027						**0**
2028	1					**1**
2029						**0**
2030						**0**
2031						**0**
2032						**0**
2033						**0**
2034						**0**
2035						**0**
2036						**0**
2037						**0**
2038						**0**
2039						**0**
2040						**0**
Total	**1**	**1**	**1**	**1**	**1**	**5**

Table 14 – ZEB Planning Projects

DEPOT INSTALLATION PROJECTS

Charging projects include purchase and installation of at least 180kW chargers and dispensers. Each bus will require one dispenser. Every three (3) buses (40' and larger) will require one (1) charger, while buses at Copley (all smaller, cutaway-style buses) which are assigned two (2) buses to one charger. Please note that six (6) 62.5 kW plug-in chargers with one dispenser each at Imperial Avenue and two (2) 62.5 kW plug-in chargers with one dispenser each at East County, Kearney Mesa, and South Bay have already been installed to support the pilot program. Additionally at South Bay, there are currently eight (8) 180 kW charging cabinets and 24 overhead charging positions with dispensers. Future dispenser installations are expected to be primarily pantograph style except for Copley where plug-in chargers are assumed.

Based on anticipated size of the future charging infrastructure at each division, the existing infrastructure does not have enough capacity to support the full buildout of BEB charging and the equipment that will be required. The total estimated power requirement for all division combined is assumed to be approximately 43 MW. Power upgrade costs are included and incorporated within the annual ZEB Annual Infrastructure Costs by Division graph (Figure 19) and table (Table 17) on the following page. Estimated total power required for each division is shown on Table 15.

Estimated Power Required	
Division	**Megawatts**
Copley	3
East County	6
Kearny Mesa	7
Imperial Avenue	10
South Bay	17
Total	**43**

Table 15 – Estimated Power Required by Division

In regard to hydrogen, cost assumptions for FCEB infrastructure are summarized in the table below.

Project	Cost Estimate
Infrastructure Planning	$150,000 per division
Incremental Addition of 15,000 Gallon Liquid Hydrogen Tank	$4,000,000 tank which includes installation (Supports approximately 50 Buses)
Maintenance Upgrades	Electrical, Lighting, Ventilation, and Gas Detection
	$125,000 per bay for depots that do not service CNG
	$50,000 per bay for depots that currently service CNG

Table 16 – FCEB Infrastructure Planning Assumptions

Costs for the Clean Transit Advancement Campus (CTAC), which will be a new facility to accommodate overflow due to reduced bus capacity at existing facilities due to infrastructure space requirements have not been incorporated in this analysis. However, there will be a need to construct a new facility as the build-out progresses. Initial concept planning for CTAC has already begun as design workshops have been held which include BEB and FCEB infrastructure. Additionally, three of the five land parcels have been acquired at the time of this plan update. Estimated costs of $350 million for CTAC are not included in this analysis.

MIXED BEB & FCEB

Annual costs for the FCEB infrastructure portion of the mixed fleet are provided in Figure 19. Table 17 summarizes all costs for charging infrastructure by division for Mixed BEB & FCEBs. Figure 20 provides the cumulative total cost breakdown by division. The estimated total infrastructure costs are approximately $488 million; this includes all divisions:

- All gantry structural projects
- All power upgrade projects
- All charger and dispenser installations
- All planning projects
- Design engineering costs

- 20% contingency on all costs.
- Microgrid solutions (BESS, solar panels, and generator)
- Hydrogen tank (Division TBD)

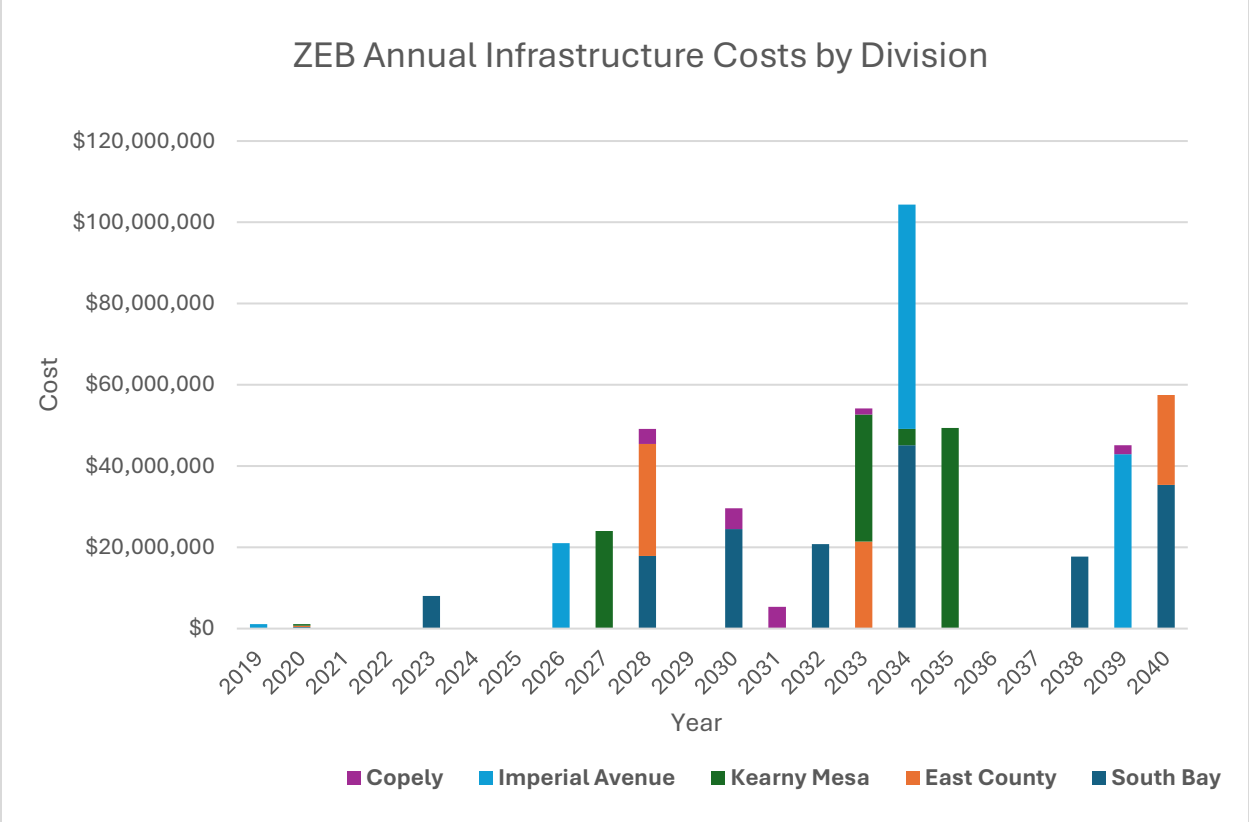


Figure 19 – Annual Infrastructure Costs, Mixed BEB & FCEB

Division	Cost
South Bay	$ 169,644,977.09
East County	$ 71,525,350.51
Kearny Mesa	$ 108,991,671.37
Imperial Avenue	$ 120,247,419.03
Copely	$ 17,965,803.51
Total	**$ 488,375,221.50**

Table 17 – Total Infrastructure, Mixed BEB & FCEB

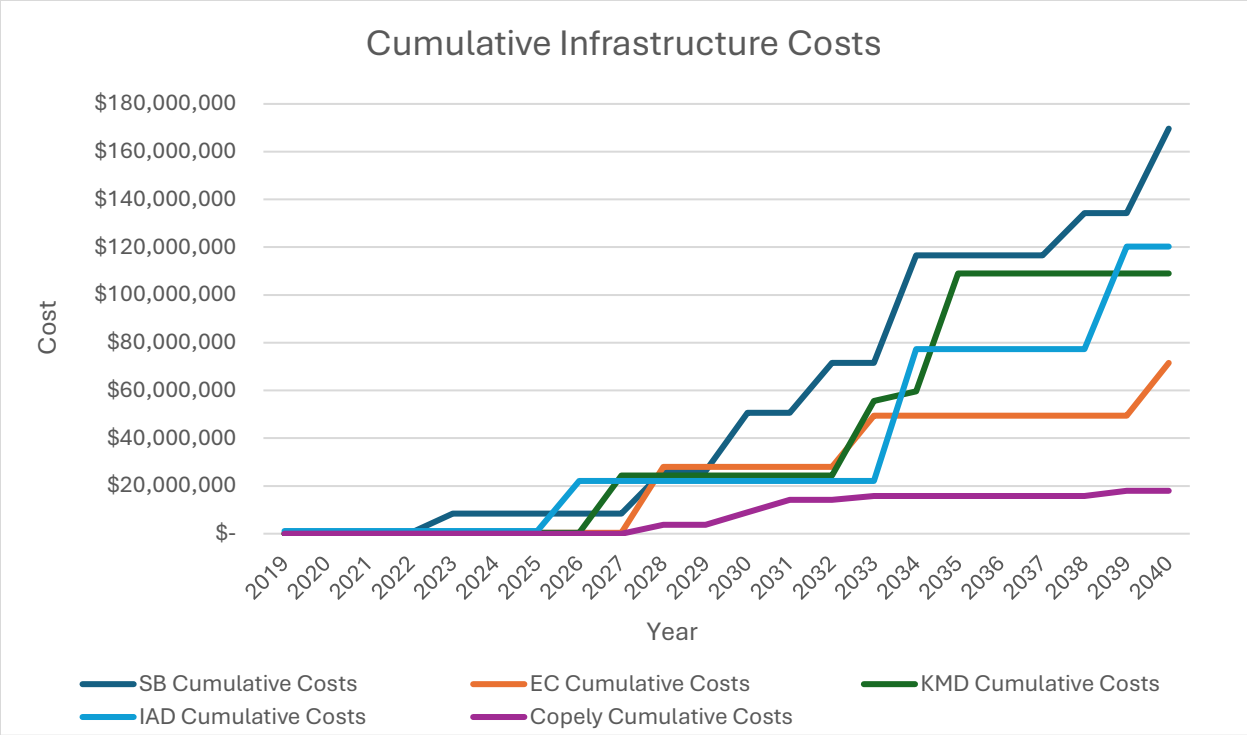


Figure 20 – Cumulative Infrastructure Costs, Mixed BEB & FCEB

Maintenance Assessment

One of the anticipated benefits of moving to a BEB or FCEB fleet is maintenance costs. Conventional wisdom indicates that a transit agency may attain 30% to 50% in maintenance cost savings for a BEB. This is because there are fewer fluids to replace (no engine oil or transmission fluid), fewer brake changes due to regenerative braking, and far fewer moving parts than on an internal combustion engine bus. However, the savings in traditional maintenance costs may be offset by the cost of battery or fuel-cell replacements over the life of the vehicles. Table 18 shows the assumed costs of scheduled and unscheduled labor and maintenance used in this analysis.

Type	Estimate
Internal combustion engine	$0.89/mi
BEB	$0.79/mi
FCEB	$1.05/mi including tires

Table 18 – Average Labor and Materials Cost Per Mile

In addition to Labor and Maintenance, the cost impact of mid-life overhauls of major components for each type of bus are estimated. Assumptions used in this analysis are given in Table 19.

Type	Overhaul Scope	Estimate
Internal combustion engine	Engine/Transmission Overhaul	$50k per bus
BEB	Battery Replacement	$125 per kWh
FCEB	Battery Replacement	$125 per kWh
	Fuel Cell Overhaul	$40k per bus

Table 19 – Mid-Life Overhaul Cost Assumptions

Baseline

The baseline assumes no changes to MTS' current fleet configuration throughout the life of the study, i.e. no ZEB purchases other than those already planned, and is used for comparative analysis. Figure 21 shows the combined labor, materials and mid-life overhaul costs for the Baseline scenario fleet projection for each year of the study, in 2025 dollars. Annual fleet maintenance costs an average of approximately $25 million per year.

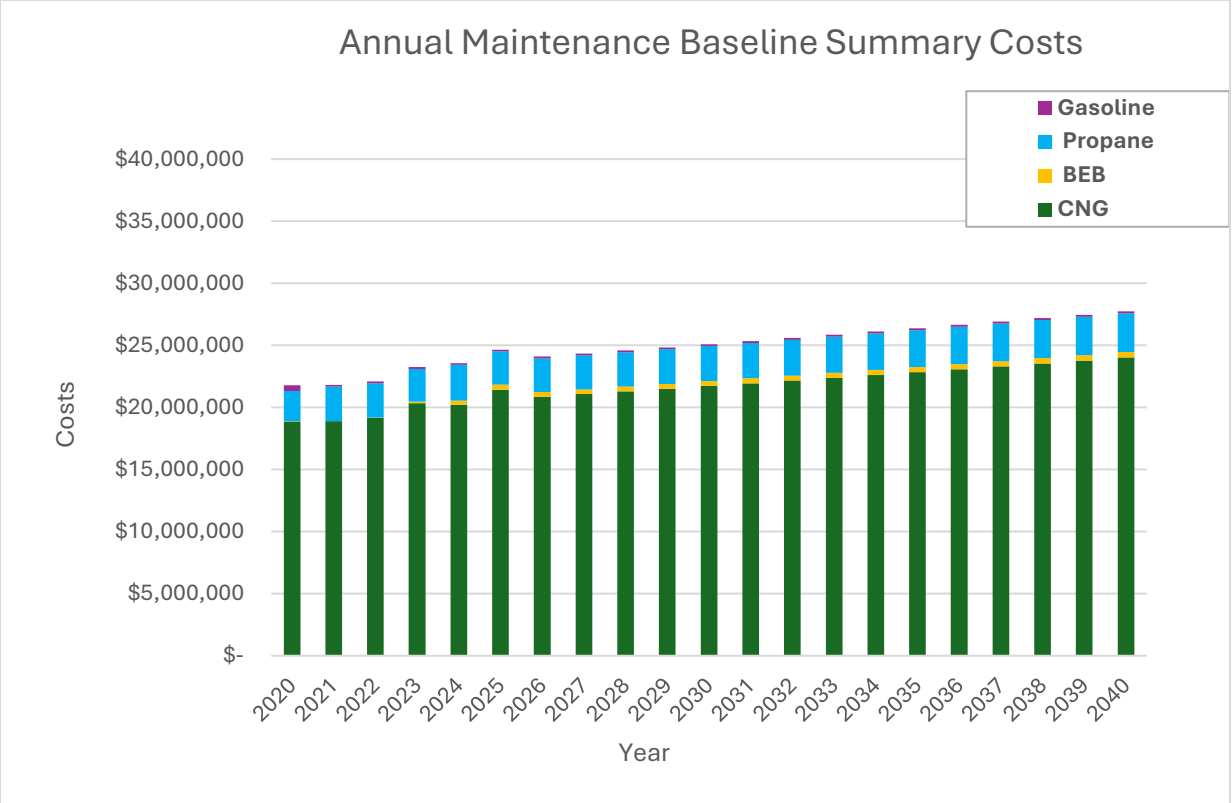


Figure 21 – Annual Fleet Maintenance Costs, Baseline

MIXED BEB AND FCEB

Figure 22 shows the combined labor, materials and mid-life overhaul costs for the Mixed BEB and FCEB scenario for each year of the transition, in 2025 dollars.

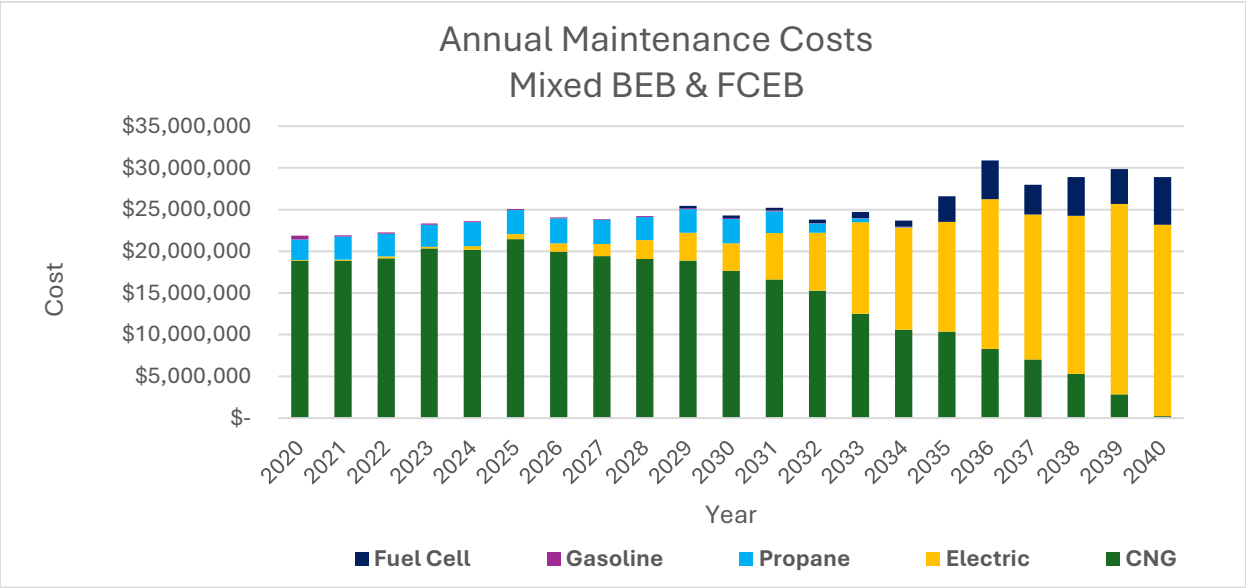


Figure 22 – Annual Maintenance Costs, Mixed BEB & FCEB

Maintenance Assessment Cost Comparison

The Maintenance Assessment includes all labor, materials and overhaul costs over the ZEB transition. Figure 23 shows the cumulative maintenance costs for the Mixed BEB & FCEB compared to the Baseline. Table 20 shows the combined total costs and the incremental cost over the Baseline.

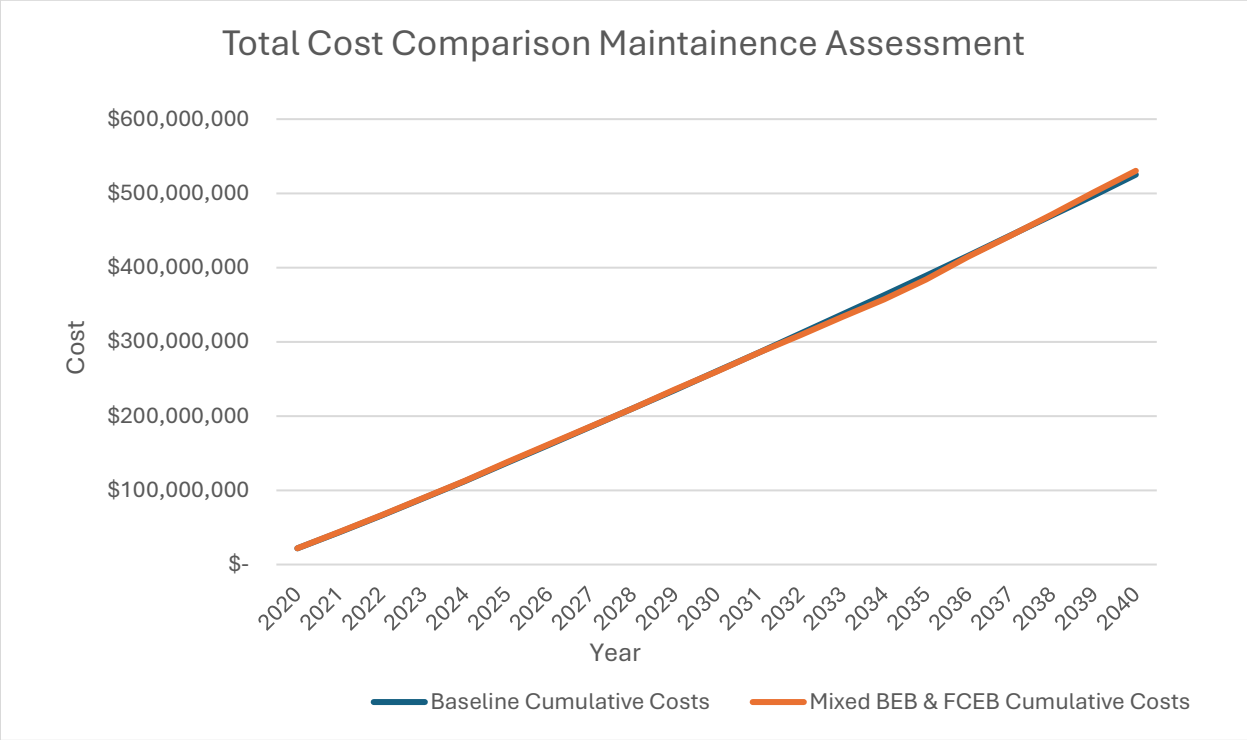


Figure 23 – Total Cost, Maintenance Assessment

Scenario	Cost
Baseline	$762,263,000
Mixed BEB and FCEB	$804,691,000

Table 20 – Total Cost, Maintenance Assessment

Total Cost of Ownership Assessment

The Total Cost of Ownership Assessment compiles and organizes the results from the Fleet, Fuel, Facilities and Maintenance assessments to show total and annual costs throughout the transition. It includes selected capital and operating costs for the Mixed BEB & FCEB over the transition timeline.

It's important to note the following:

- Costs associated with CTAC are not included within this analysis.
- Other costs such as battery recycling, operator/maintenance training costs, etc. were also not included within the analysis
- Cost reductions due to economies of scale for ZEB technologies were not assumed, since there is no historical basis or trend for this assumption.

Future changes to MTS' service level, depot locations, route alignments, block scheduling, etc. are unforeseen. The sections below provide best estimates using the information currently available, and using the culmination of assumptions explained throughout this study.

BASELINE

The Baseline scenario is used for comparative purposes only. It assumes no changes to the agency's current fleet configuration throughout the life of the study, i.e. no ZEB-related purchases. Table 21 shows the fleet, fuel, facilities and maintenance costs for the Baseline scenario in 2025 dollars.

Baseline Total Cost of Ownership					
Year	Fleet	Fuel	Facilities/ Infrastructure	Maintenance	Total
2020	$ 21,461,515.82	$ 11,403,552.61	$ -	$ 21,782,205.34	$ 54,647,273.77
2021	$ 102,625,211.05	$ 11,773,596.04	$ -	$ 21,800,462.40	$ 136,199,269.49
2022	$ 27,989,907.00	$ 16,059,592.99	$ -	$ 22,085,301.60	$ 66,134,801.59
2023	$ 27,947,832.00	$ 20,091,929.06	$ -	$ 23,249,409.30	$ 71,289,170.36
2024	$ 56,634,777.00	$ 16,151,761.26	$ -	$ 23,549,528.68	$ 96,336,066.94
2025	$ 35,382,467.00	$ 16,985,531.39	$ -	$ 24,648,303.32	$ 77,016,301.71
2026	$ 70,315,530.00	$ 17,904,909.90	$ -	$ 24,096,201.31	$ 112,316,641.21
2027	$ 62,280,233.00	$ 18,085,767.58	$ -	$ 24,339,597.29	$ 104,705,597.86
2028	$ 47,525,100.00	$ 18,268,452.10	$ -	$ 24,585,451.80	$ 90,379,003.90
2029	$ 50,175,288.00	$ 18,452,981.92	$ -	$ 24,833,789.70	$ 93,462,059.62
2030	$ 49,156,605.00	$ 18,639,375.67	$ -	$ 25,084,636.06	$ 92,880,616.73
2031	$ 51,843,144.00	$ 18,827,652.19	$ -	$ 25,338,016.22	$ 96,008,812.42
2032	$ 67,538,799.00	$ 19,017,830.50	$ -	$ 25,593,955.78	$ 112,150,585.28
2033	$ 108,451,021.00	$ 19,209,929.80	$ -	$ 25,852,480.59	$ 153,513,431.39
2034	$ 73,527,042.00	$ 19,403,969.49	$ -	$ 26,113,616.76	$ 119,044,628.25
2035	$ 29,550,620.00	$ 19,599,969.18	$ -	$ 26,377,390.66	$ 75,527,979.85
2036	$ 74,871,418.00	$ 19,797,948.67	$ -	$ 26,643,828.95	$ 121,313,195.62
2037	$ 55,799,619.00	$ 19,997,927.95	$ -	$ 26,912,958.54	$ 102,710,505.49
2038	$ 73,368,956.00	$ 20,199,927.22	$ -	$ 27,184,806.60	$ 120,753,689.83
2039	$ 89,425,216.00	$ 20,403,966.89	$ -	$ 27,459,400.61	$ 137,288,583.50
2040	$ 87,306,340.00	$ 20,610,067.57	$ -	$ 27,736,768.29	$ 135,653,175.86
Total	**$ 1,263,176,640.87**	**$ 380,886,639.99**	**$ -**	**$ 525,268,109.81**	**$ 2,169,331,390.67**

Table 21 – Total Costs, Baseline

MTS's total operating and capital costs are estimated at nearly $2.2 billion from 2020 to 2040. There are no facilities costs for this scenario. Since it is assumed that MTS will not be adding any additional buses (ZEB or internal combustion engine), other than those that are already included in the baseline scenario, no additional facilities are required.

MIXED BEB AND FCEB

Table 22 shows the combined fleet, fuel, facilities and maintenance costs related to the Mixed BEB and FCEB scenario in 2025 dollars. The total estimated combined cost is slightly over $2.9 billion over the length of the transition, from 2020 to 2040. This scenario estimates a total of 699 BEBs and 59 FCEBs (762 total ZEBs) in service by 2040.

Mixed BEB & FCEB Total Cost of Ownership					
Year	**Fleet**	**Fuel**	**Facilities/ Infrastructure**	**Maintenance**	**Total**
2020	$ 21,461,515.82	$ 11,036,063.07	$ 1,111,284.00	$ 21,866,107.62	$ 55,474,970.51
2021	$ 102,625,211.05	$ 11,668,986.87	$ -	$ 21,903,687.22	$ 136,197,885.14
2022	$ 27,989,907.00	$ 16,059,592.99	$ -	$ 22,256,869.03	$ 66,306,369.02
2023	$ 27,947,832.00	$ 20,091,929.06	$ 8,000,000.00	$ 23,318,462.83	$ 79,358,223.89
2024	$ 56,634,777.00	$ 16,151,761.26	$ -	$ 23,594,223.78	$ 96,380,762.04
2025	$ 35,382,467.00	$ 17,013,650.69	$ 6,580.00	$ 25,049,643.50	$ 77,452,341.19
2026	$ 66,429,830.00	$ 15,730,102.38	$ 21,000,000.00	$ 24,067,320.90	$ 127,227,253.27
2027	$ 76,565,869.00	$ 15,787,606.41	$ 24,000,000.00	$ 23,879,390.66	$ 140,232,866.07
2028	$ 29,494,350.00	$ 16,189,698.08	$ 49,170,728.55	$ 24,210,685.12	$ 119,065,461.75
2029	$ 61,465,207.00	$ 18,086,600.70	$ -	$ 25,453,375.31	$ 105,005,183.00
2030	$ 71,287,290.00	$ 18,969,332.67	$ 29,640,595.37	$ 24,272,451.80	$ 144,169,669.84
2031	$ 71,889,651.00	$ 19,426,123.98	$ 5,346,383.51	$ 25,195,835.33	$ 121,857,993.82
2032	$ 92,272,582.00	$ 19,973,036.07	$ 20,792,520.67	$ 23,782,066.41	$ 156,820,205.15
2033	$ 107,028,594.00	$ 21,869,331.30	$ 54,195,821.28	$ 24,729,409.65	$ 207,823,156.23
2034	$ 106,359,893.00	$ 22,652,866.07	$ 104,364,223.65	$ 23,684,063.14	$ 257,061,045.86
2035	$ 42,290,464.00	$ 26,911,929.47	$ 49,361,010.40	$ 26,593,902.13	$ 145,157,306.01
2036	$ 108,512,354.00	$ 30,377,252.66	$ -	$ 30,906,734.12	$ 169,796,340.78
2037	$ 80,535,253.00	$ 31,185,263.03	$ -	$ 27,974,777.55	$ 139,695,293.58
2038	$ 101,684,650.00	$ 31,347,679.94	$ 17,681,309.08	$ 28,882,997.29	$ 179,596,636.31
2039	$ 129,348,724.00	$ 30,425,638.71	$ 45,112,341.39	$ 29,864,308.06	$ 234,751,012.17
2040	$ 126,610,412.00	$ 30,277,227.85	$ 57,481,139.59	$ 28,906,960.12	$ 243,275,739.57
Total	**$ 1,543,816,832.87**	**$ 441,231,673.26**	**$ 487,263,937.50**	**$ 530,393,271.58**	**$ 3,002,705,715.20**

Table 22 – Total Costs, Mixed BEB & FCEB

TOTAL ESTIMATED COSTS

Figure 24 and Figure 25 show the combined total costs comparing Baseline with the Mixed BEB & FCEB

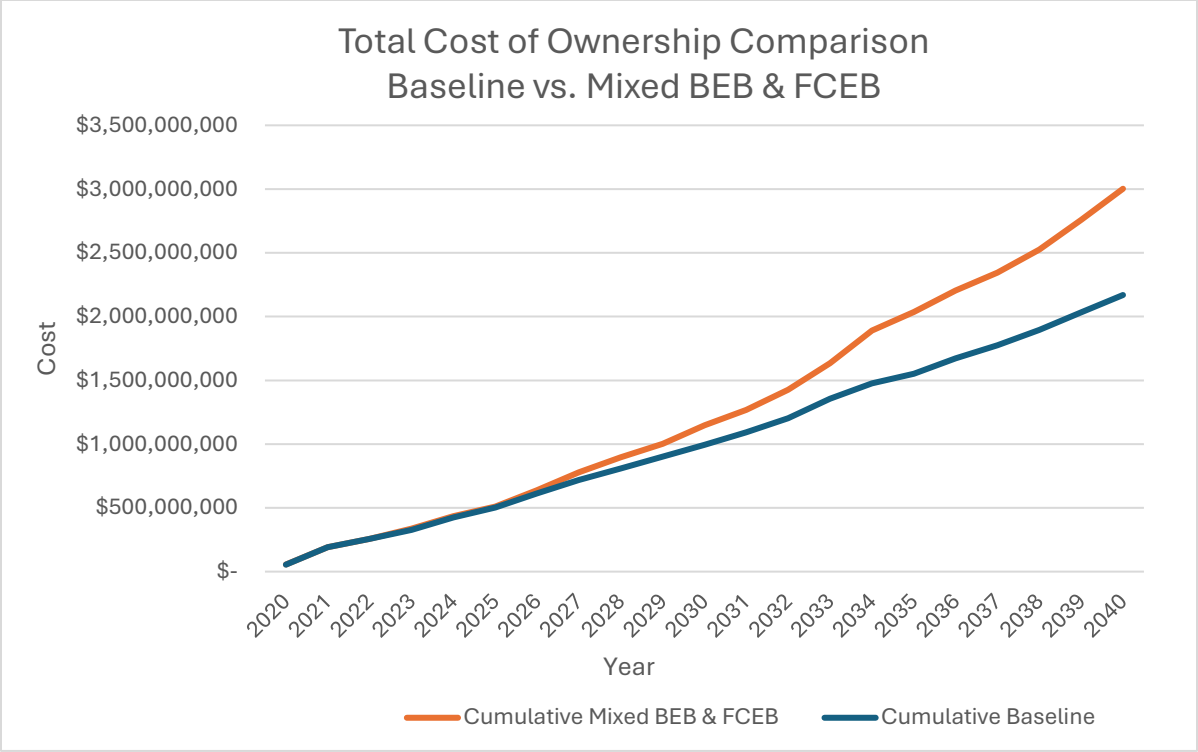


Figure 24 – Total Cost of Ownership, 2020-2040 Baseline vs. Mixed BEB & FCEB

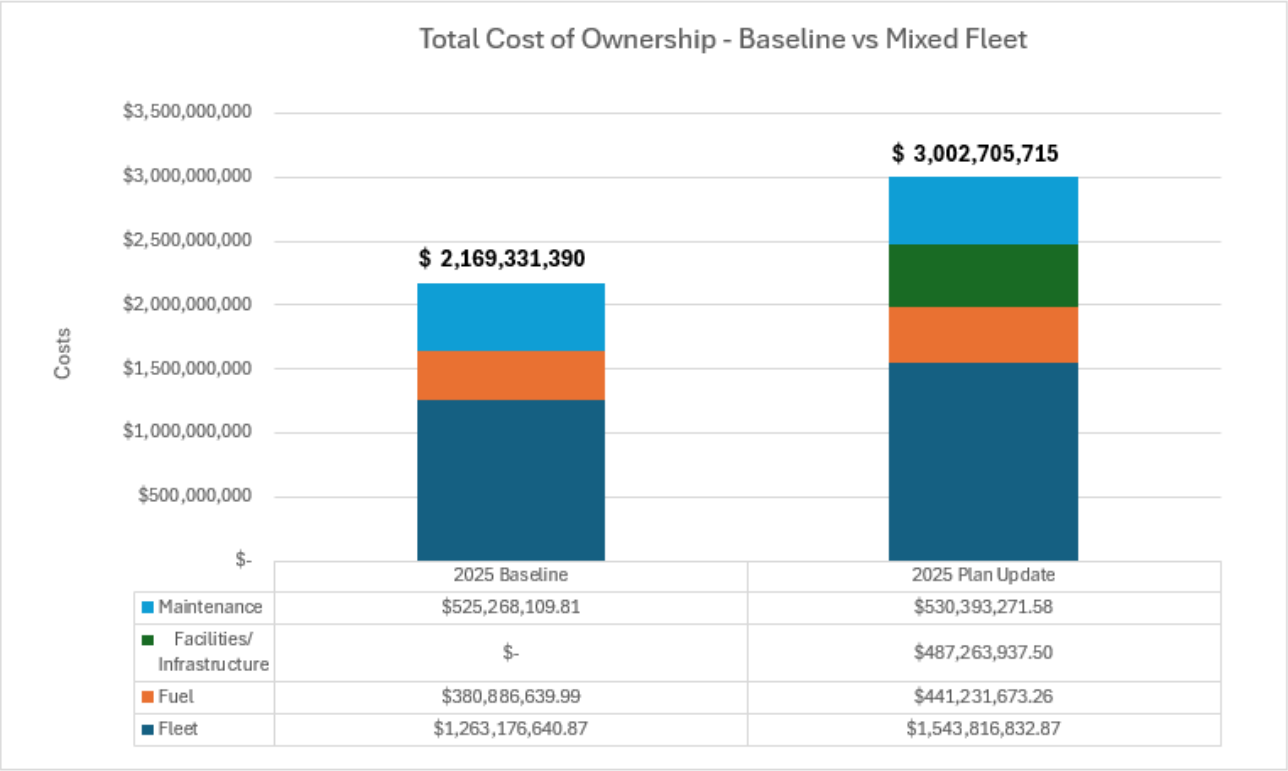


Figure 25 – Total Cost of Ownership, Baseline vs. Mixed BEB & FCEB

Conclusions and Recommendations

ZEB technologies are in a period of rapid development and change. While the technology is proven in many pilot deployments, it is not yet matured to the point where it can easily replace current internal combustion engine technologies on a large scale. BEBs will require significant investment in facilities and infrastructure and may require changes to service and operations to manage their inherent constraints. On the other hand, FCEBs are believed to provide a closer operational equivalent to CNG, however, the incremental cost of buses, fueling infrastructure, and fuel places this technology at a serious disadvantage.

CARB's ICT regulation is an achievement toward addressing the challenges of climate change with a goal of 100% zero-emission transit fleets by 2040. However, as demonstrated in this analysis, there will be a substantial cost as well as technical challenges. Transit agencies may be challenged to meet this goal and provide the same level of passenger service. Fortunately, CARB's ruling provides waivers for economic hardship and in the event the current state of depot-charged bus technology does not meet service requirements.

A primary assumption for this analysis is that MTS is unable to increase fleet size due to significant space constraints at their depots and, as a result, vehicles must be replaced on a one-for-one basis. Analysis of additional land purchase and construction of the Clean Transit Advancement Campus (CTAC) was not part of this analysis, though it is expected to cost approximately $350 million to complete if required.

with an incremental cost of approximately $833 million, the Mixed BEB and FCEB approach that transitions approximately 99% of MTS' fleet to ZEB by 2040. There are expected complexities with managing the fleet through the transition that would require maintain existing internal combustion engine vehicle infrastructure (CNG, propane, and gasoline), installing new BEB infrastructure, and installing new FCEB fueling infrastructure. Space constraints at the depot will require careful planning if this path is continued. MTS may also experience additional benefits as a result of the transition to ZEBs.

MTS has accumulated ZEB credits from their procurement of ZEBs prior to 2023. These credits can be used in place of ZEB purchases to satisfy CARB's ZEB procurement requirements which started in 2023. With the purchase of thirteen (13) BEBs to support the ZEB pilot operations in 2019 and 2020, and the purchase of twelve (12) BEBs to support a new service in 2021, MTS recently had twenty-five (25) ZEB credits that can be applied to ZEB purchase requirements from 2023 and beyond. In February 2025, the MTS Board of Directors approved a request to CARB, utilizing seven (7) credits for FY25 bus purchases and thirteen (13) credits for FY26 bus purchases, both extinguishing the 25% ZEB requirement for those fiscal years. These developments have been incorporated into this analysis.

As a result, recommendations for MTS are as follows:

1. Remain proactive with ZEB deployments: MTS has been proactive in the purchase and deployment of BEBs throughout the ZEB Pilot Program and since it has ended. To incorporate FCEBs into the fleet, lower fuel costs and lower costs associated with the production hydrogen will be required. MTS should move forward carefully, taking

advantage of various grant and incentive programs to offset the incremental cost for ZEB deployment.

2. Target specific routes and blocks for early ZEB deployments: MTS should consider the strengths of given ZEB technologies and focus those technologies on routes and blocks that take advantage of their efficiencies and minimize the impact of the constraints related to the respective technologies. Technologies cannot follow a “one-size-fits-all” approach from either a performance or cost perspective. Matching technology to the service will be a critical best practice.
3. Continue with BEBs and consider FCEBs: At this stage, it is too early to tell which technology will dominate the market 10 to 20 years from now. Having the capability to deploy both ZEB technologies creates an opportunity for MTS to fully assess BEBs and FCEBs to determine which technology can best meet the operational range requirements while being financially efficient and sustainable.
4. Do not over commit to one form or brand of technology over another. ZEB and charging technology is rapidly changing each day as battery chemistry develops to help improve bus efficiency/range and charging equipment becomes more sophisticated. Commitment to one form and brand of technology can have a detrimental impact to efficient operations and service as a whole, especially if significant advancements are assumed to be made.
   Continue to maintain or increase the level of service throughout the ZEB transition. As outlined in the ICT regulation, CARB does not expect, recommend or require a transit agency to reduce service at the expense of completing the transition. If the transition costs or technology limitations result in service reductions, it would be counter-productive to greenhouse gas reduction by propelling transit riders to utilize personal vehicles and increase VMT’s and overall emissions.
   The transition to ZEB technologies represents a paradigm shift in bus procurement, operation, maintenance, and infrastructure. Technology requires significant development before it is ready to support fleetwide transitions. However, it is only through a continual process of deployment with specific goals for advancement that the industry can achieve the goal of economically sustainable, zero-emission public transit. Ultimately, the ZEB technology that is most efficient and sustainable to operate will evolve into either the majority ZEB solution or the only ZEB solution. MTS, with endorsement and approval from their Board of Directors, elected to pursue a mixed-use scenario that will allow them to initially deploy BEBs and explore possible opportunities and funding mechanisms to deploy FCEBs in service where BEBs are not able to meet range requirements. MTS will continue to monitor technology improvements and funding availability to accelerate the transition to a 100% zero-emission fleet. Evaluation will be completed in annual updates provided to the MTS Board of Directors and CARB.

Metropolitan Transit System

Zero Emission Bus (ZEB) Program and Transition Update

Board of Directors

Policy History

- Urban Fleet Transit Rule
  - Rule passed February 2000 by California Air Resources Board (CARB)
  - Alternative fuel path made way for CNG fleet
- Innovative Clean Transit Rule (ICT)
  - Rule passed December 2018 by CARB
  - ZEB Transition Study & CARB's Rollout Plan approved - Sept 2020
    - CARB approved MTS Rollout Plan December 2020
  - Convert fleet to Zero Emission Vehicles by 2040 (Governor's goal)
  - 60-foot, 45-foot & Minibuses exempt until 2026
  - Comprehensive Review Phase II (2025)
    - State of technology & viability of transition
    - Determine if exemption for bus types is needed beyond 2026

Starting January 1st	Percent of New Bus Purchases as ZEBs
2023	25%
2026	50%
2029	100%

MTS ZEB Pilot Program

- Board approved pilot program - October 2017
- Pilot Charging Infrastructure installed (plug-in stand-alone chargers):
  - Imperial Ave Division – July 2019
  - Kearny Mesa, East County & South Bay Divisions – April 2020
- Battery electric buses begin in-service December 2019
- Purpose of pilot to better understand ZEB technology for informed decision making & validate application to MTS service needs
- Pilot program ended - December 2021

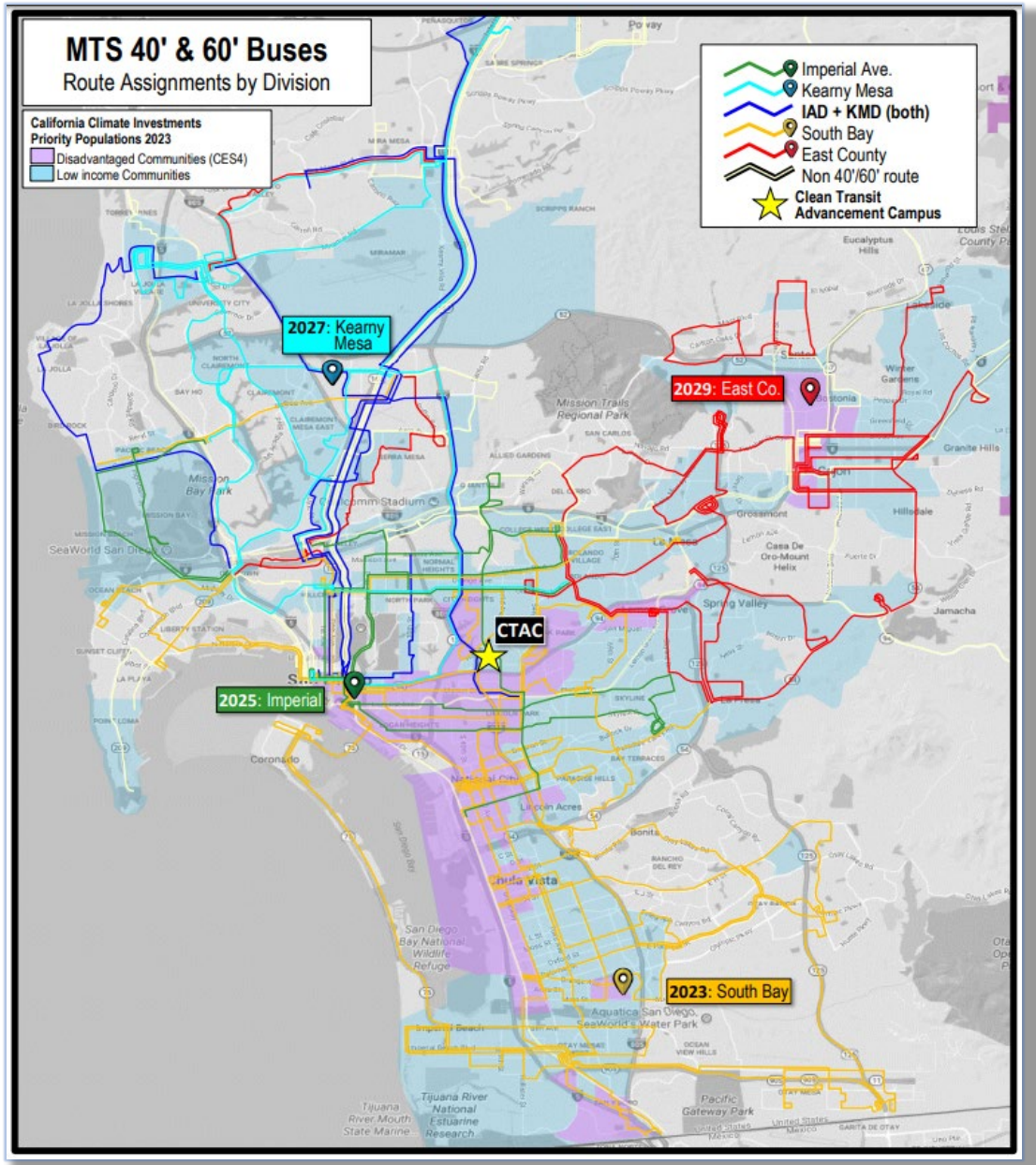
MTS Transition

- IAD Overhead Charging Master Plan - completed August 2022
- South Bay Overhead Master Plan – August 2020
- SB Overhead Charging Infrastructure - completed September 2023
  - Phase I/II construction - 24 Charging Positions
  - 12 Articulated sixty-foot electric began revenue service - October 2023 - Rapid Route 227
- KMD Overhead Charging Master Plan - completed May 2024
  - Design of Phase I currently in development
- EC Overhead Charging Master Plan – Draft document is under review and will nearly be finalized

ZEB Deployment

- Four divisions for 40’/60’ buses
  - Imperial Ave. (Downtown)
  - Kearny Mesa
  - South Bay (Chula Vista)
  - East County (El Cajon)
- 25 BEBs in fleet
  - 12 – 40ft BEBs & 13 – 60ft BEBS
  - 1.5 million cumulative miles (April data)
- Divisions require charging infrastructure
- Prioritize charging infrastructure
- DAC-serving routes operate from each division

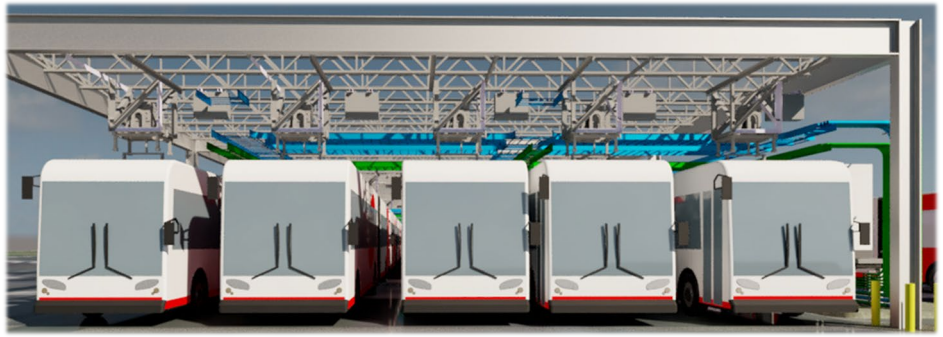
★ CTAC Site

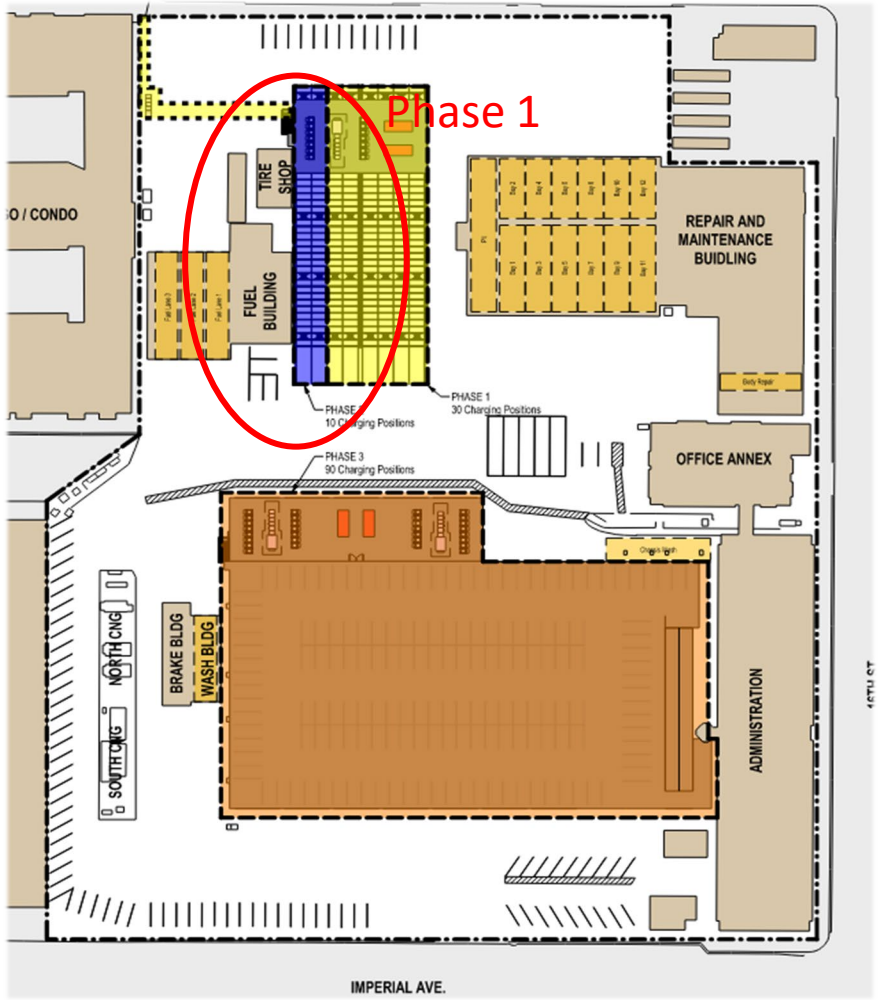


South Bay Charging Infrastructure Photos

Imperial Avenue Division

- **Imperial Avenue (Downtown)**
  - Master Plan: Completed August 2022
    - Charging positions for 161 buses
    - Phase 1 - 30 charging positions
    - Phase 2 - Overhead parking deck
  - Project Schedule – Phase 1:
    - Design Completed: Fall 2023
    - Advertise for Construction: Summer 2024
    - Start Construction: August 2025
    - Construction Complete: Summer 2026





Kearny Mesa and East County

- **Kearny Mesa**
  - Master Plan: Completed March 2024
  - Start Design: Winter 2025
  - Start Phase 1 Construction: Winter 2026
    - 38 charging positions – complete Summer 2027
- **East County**
  - Master Plan: Start Fall 2024
    - Consultant RFP currently in-process
  - Start Design: Summer 2025 (On Hold)
  - Start Phase 1 Construction: Winter 2027 (Est.)
    - 36 charging positions – complete Summer 2028

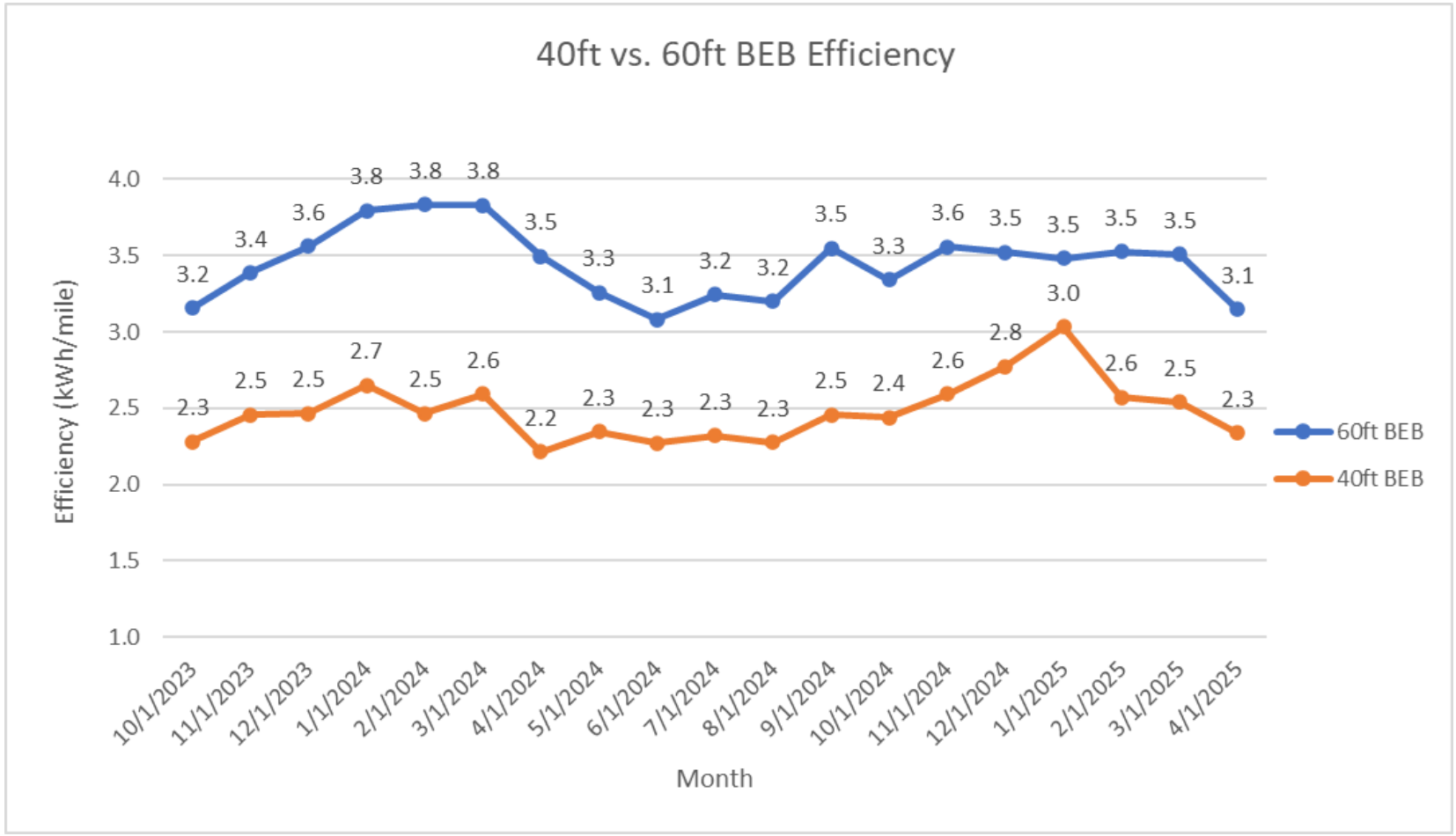
Other Developments

- Workforce Training
- Safety
  - Working with consultant to develop BEB Fire & Life Safety Plan
- Hydrogen
  - Continued education and observation (In Master Plans for all locations)
- Non-Revenue Vehicle Charging
  - Design phase for Level II plug-in charging infrastructure at IAD (12 vehicles)
- Copley Division (Access)
  - Ordered 2 Ford Paratransit Electric Vans with chargers included (Pilot project)
- South Bay Division
  - 13 incoming 40’ New Flyer BEBs to be delivered Summer 2025

ZEB Program Performance Report

July 2023 – April 2025

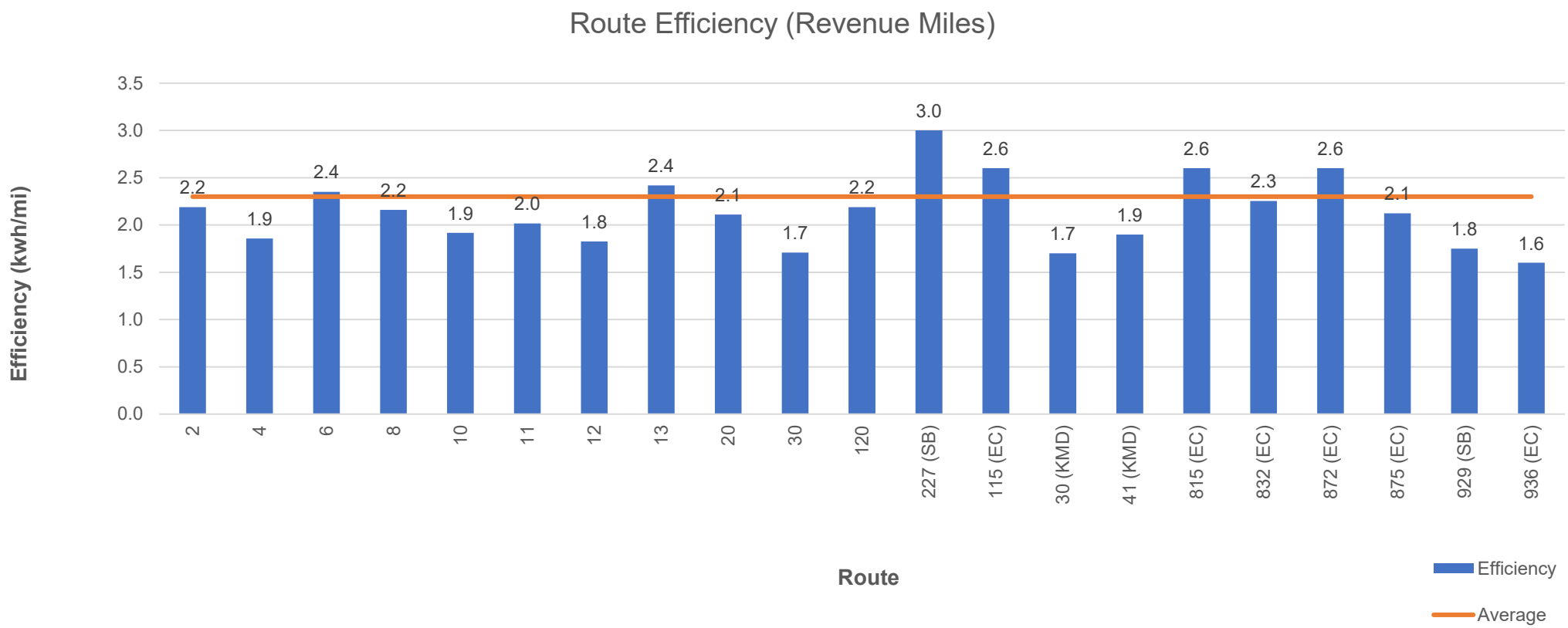
Monthly Fleet Efficiency (Total Miles)



Notes:

- BEB Bus type efficiency:
  - 40’ Avg = 2.5 kWh/Mile (Since July 2022)
    - 466 kw (New Flyer) and 444 kw (Gillig) on board storage
  - 60’ Avg = 3.5 kWh/Mile (Since October 2023)
    - 610 kw (New Flyer) on board storage
  - Fleet Avg = 2.7 kWh/Mile
- 80% battery utilization

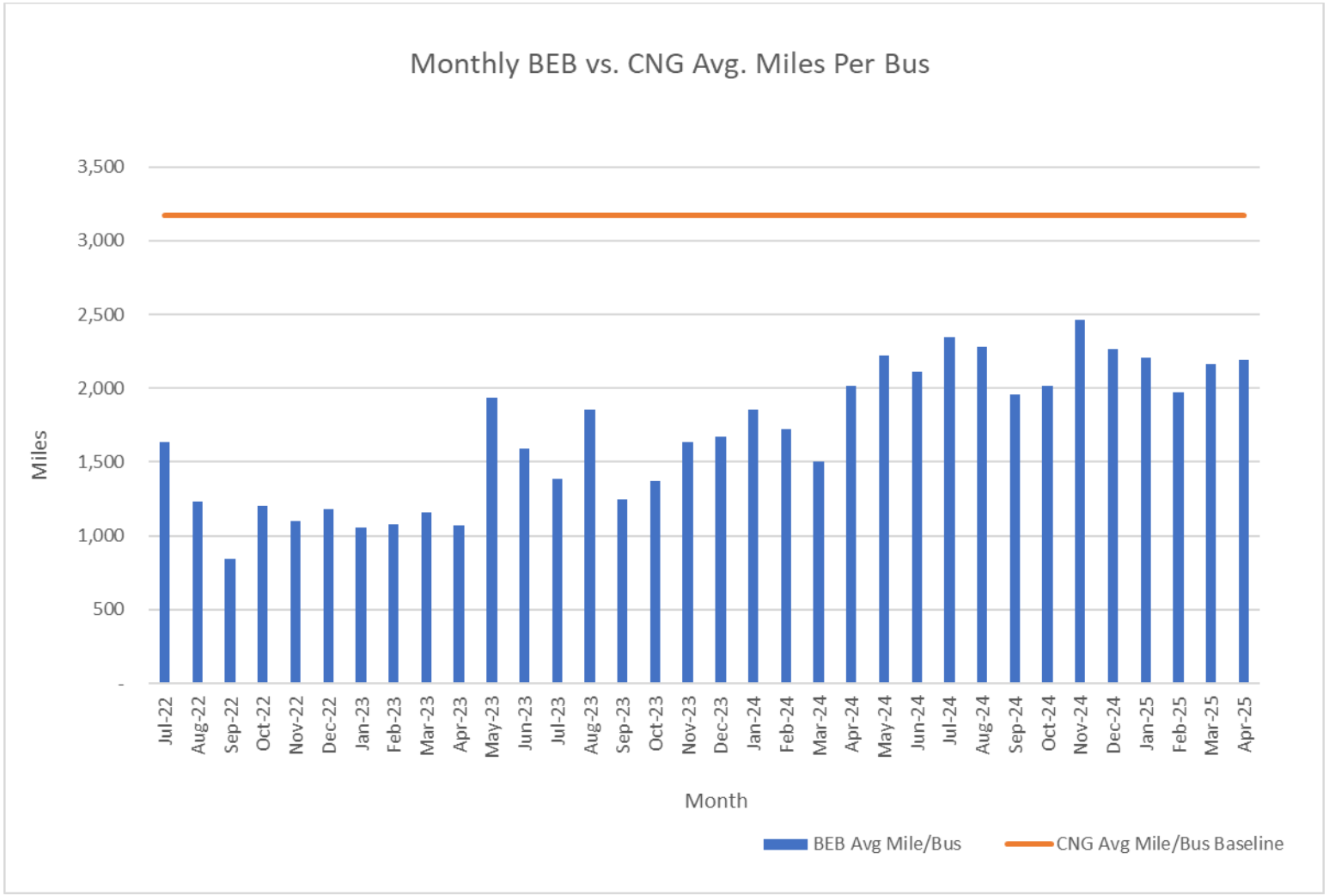
Avg. Efficiency by Route (Revenue Miles)



Notes:

- Efficiency calculated at bus, not meter

CNG vs. ZEB Monthly Mileage/Bus



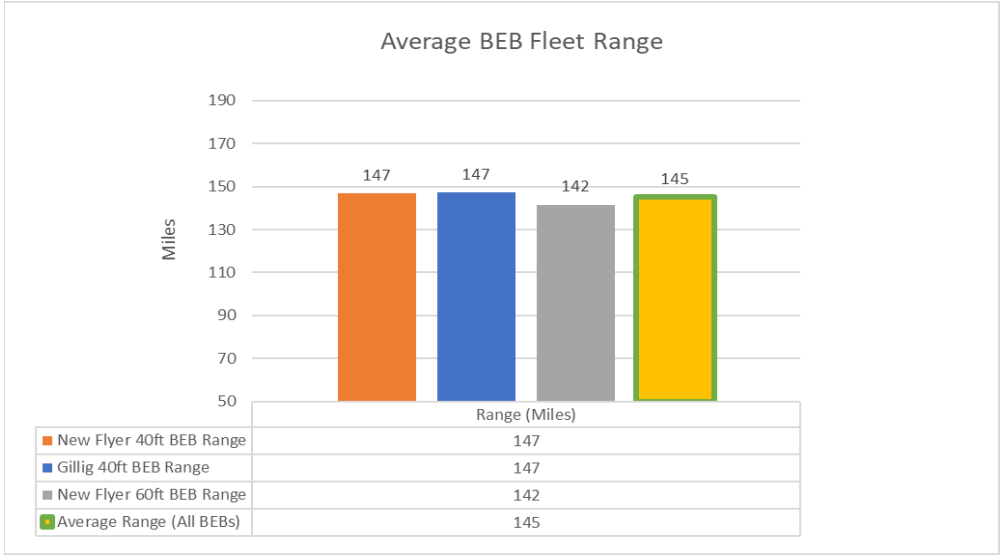
Avg. CNG	**3,172**
Avg. BEB (Since July 2022)	**1,709**

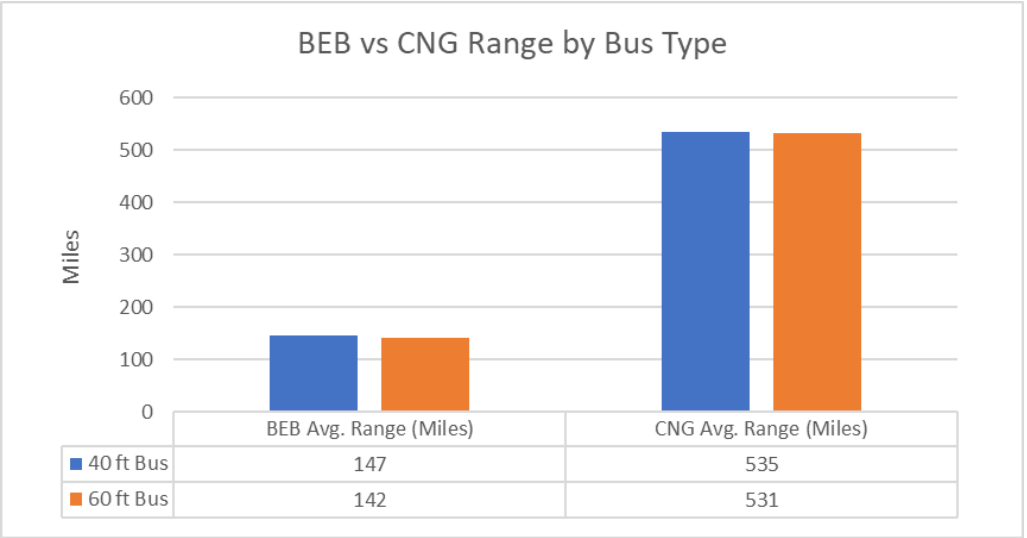
Note:

- Not 1 for 1 Replacement
- BEB Avg monthly miles/bus
  - FY24 – 1,716 miles/bus
  - FY25 – 2,186 miles/bus

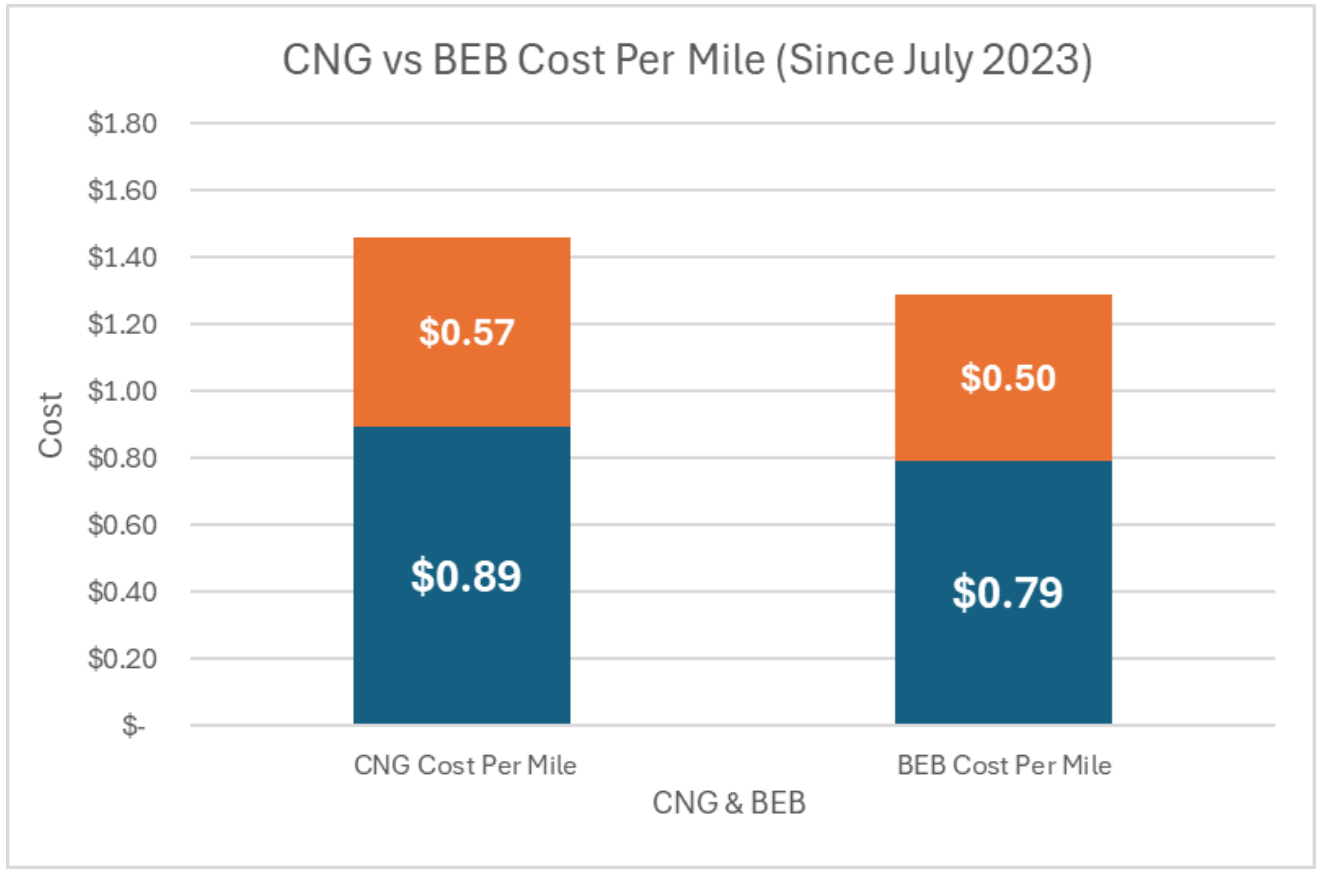
Efficiency Summary

- **Environmental Factors**
  - Topography
  - Speed
  - Climate
  - Driver Behavior
- **<u>Fleet Range</u>** (145 miles on Avg)
  - Range varies based on environmental factors (max 150 miles)
  - Limited routes/blocks available within range limitation
  - No indication of battery degradation
  - Size/Type of Bus





CNG vs. ZEB Fuel & Maintenance

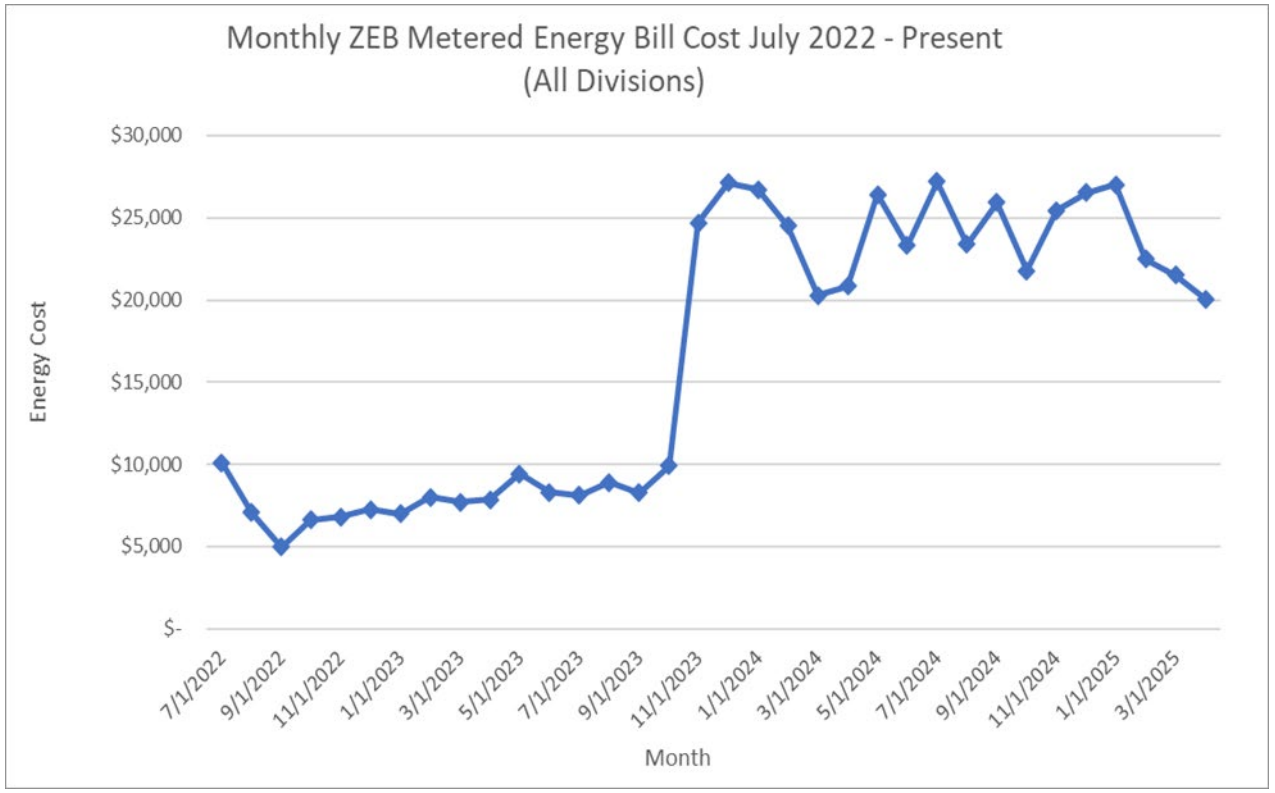


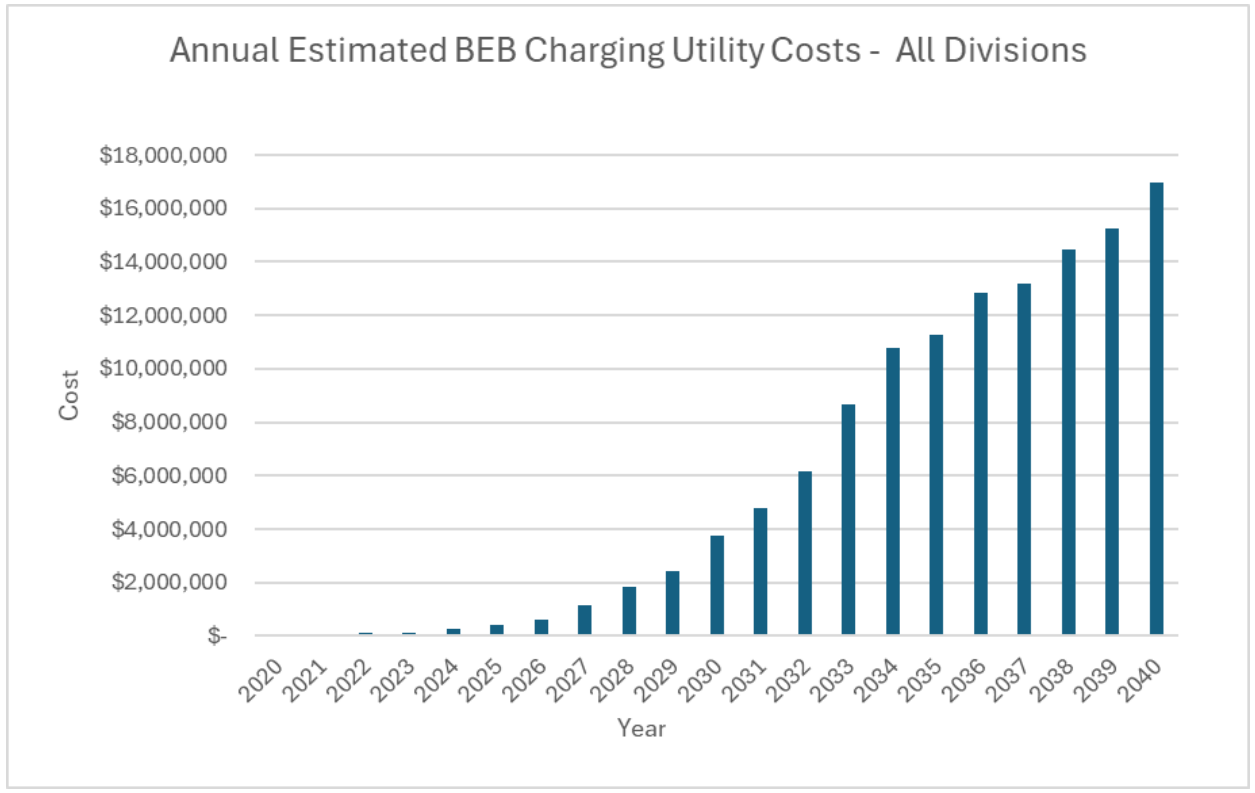
July 2023-Present	Maintenance Cost Per Mile	Energy/Fuel Cost Per Mile	Total Cost Per Mile
CNG Cost Per Mile	$ 0.89	$ 0.57	$ 1.46
BEB Cost Per Mile	$ 0.79	$ 0.50	$ 1.29

Notes:

- Data from MTS & Transdev
- Maintenance cost/mile includes work order costs only
- Data from (July 2023 – April 2025)

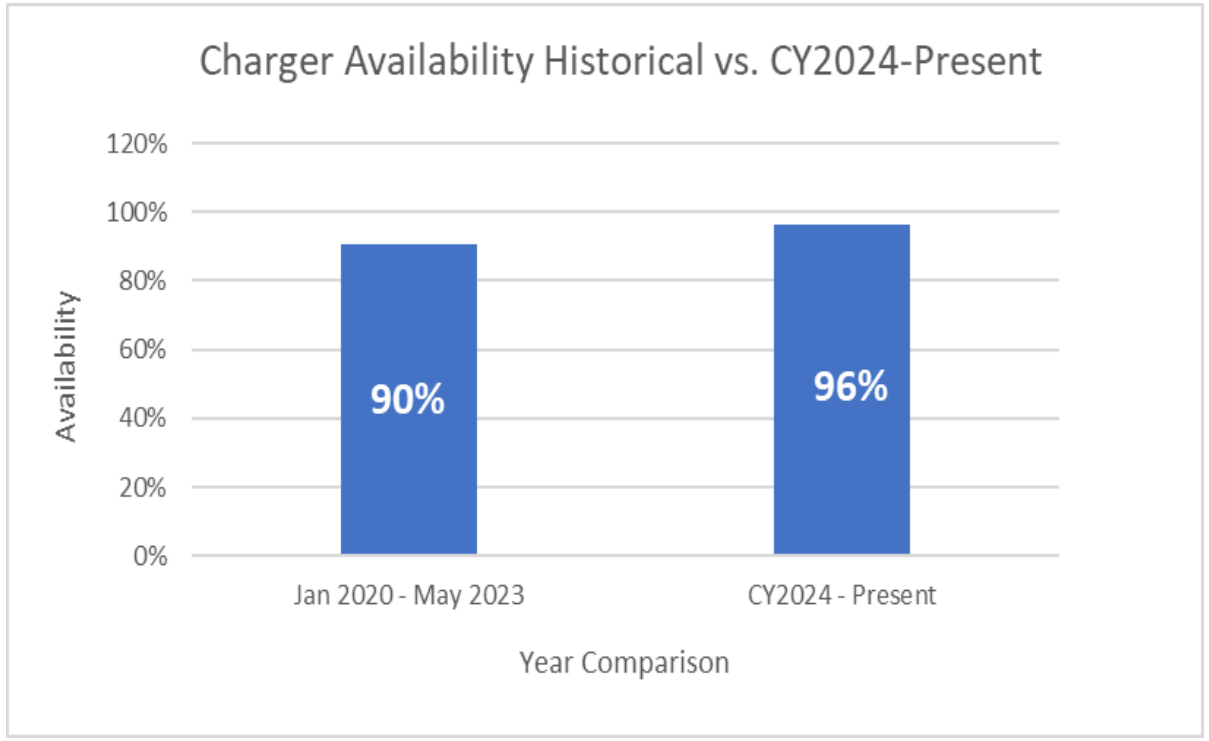
Monthly ZEB kWh Consumption and Energy Bill Cost





Approximate SDG&E ZEB meter bill costs totals
FY23 – $91,000 (495,000 kWh)
FY24 – $229,000 (1.3 million kWh)
FY25 - $241,000 (1.6 million kWh through April 2025)

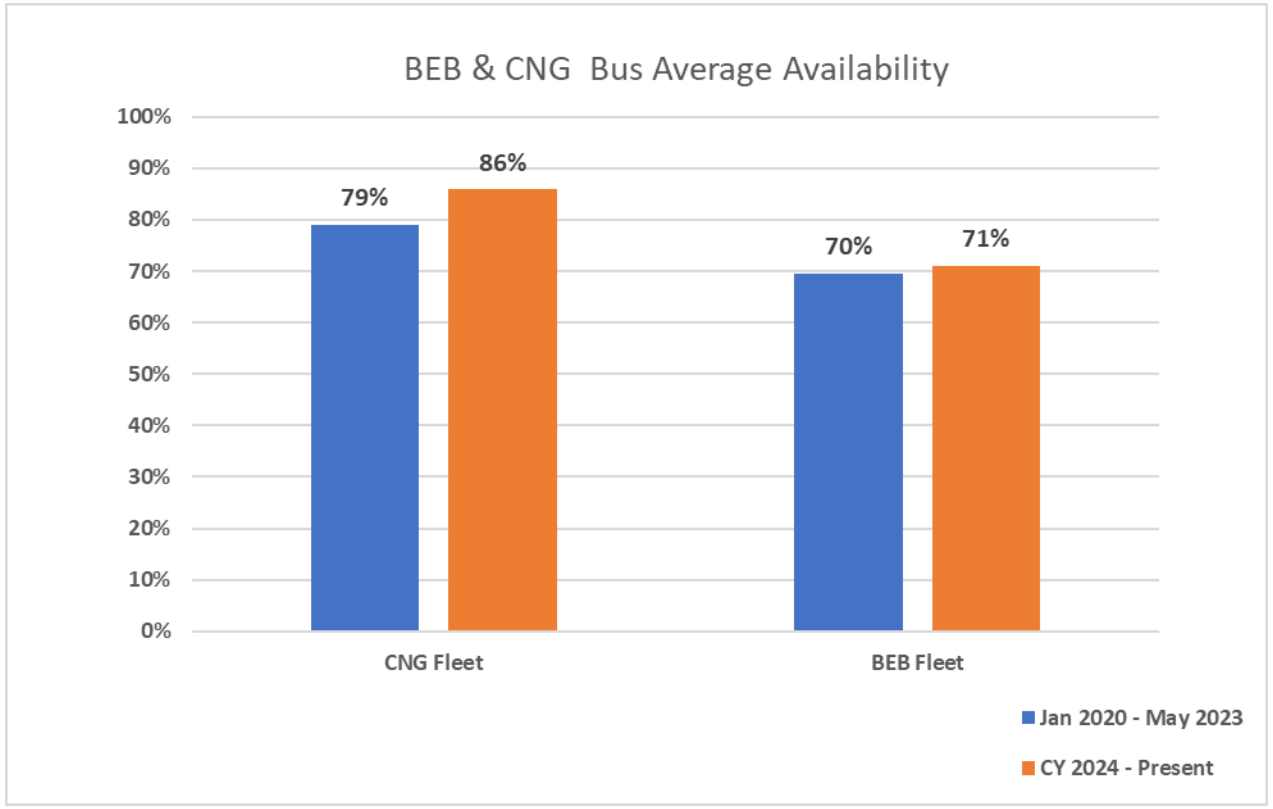
Availability



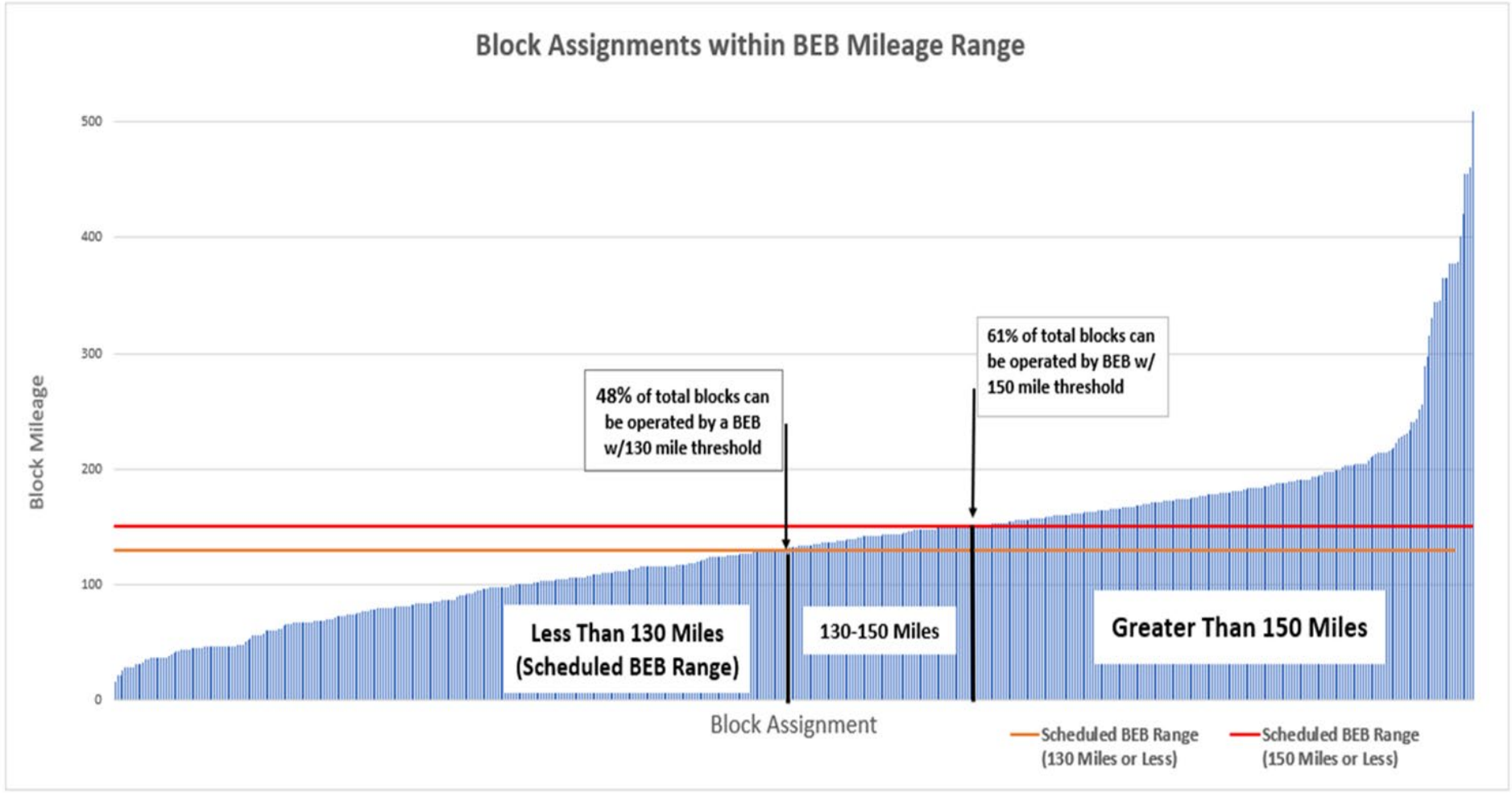
Charger Availability

- **Includes ChargePoint and Heliox Chargers**

Bus Availability



Block Limitations



130 Mile Scheduled BEB Range

- **48% of total block assignments within BEB range**
- **255 total blocks (Weekday)**

150 Mile Scheduled BEB Range

- **61% of total block assignments within the BEB range**
- **325 total blocks (Weekday)**
- **Assumes newer model BEBs have range of 170 miles**

Funding Received

- **Federal Funding Received: $3.6M**
  - Community Project Funding FFY22 & FFY23
    - IAD Charging Infrastructure
- **State Funding Received: $134.7M**
  - Senate Bill (SB) 125 State Funding - $46.3M
    - IAD, KMD, ECD, SBD: Charging Infrastructure
  - Low Carbon Transit Operations Program (LCTOP) - $43M
  - Hybrid and Zero Emission Truck and Bus Voucher Incentive Program (HVIP) - $2.3M
    - *Application most recently submitted for 13 incoming BEBs – Could receive up to $1.7M*
  - Transit and Intercity Rail Capital Program (TIRCP) - $42M
    - Funds towards IAD, KMD, SB: Charging Infrastructure, and Iris Rapid Buses
  - SDG&E's Power Your Drive Fleets (SB 350) – approx. $1.3 Million (estimated 20%) (Iris Rapid)
  - Volkswagen Mitigation Fund (VW) - $1M
    - Five (5) buses

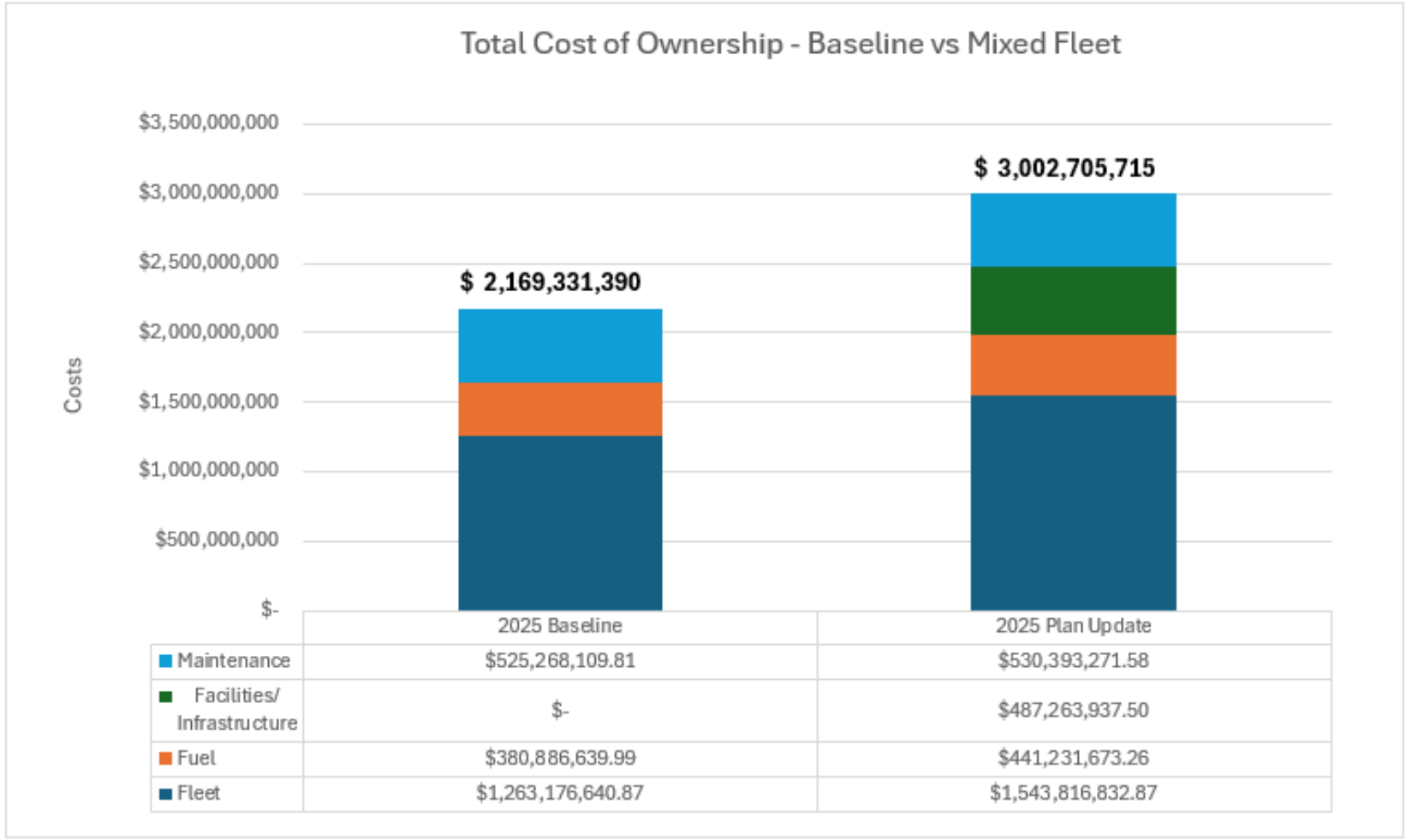
Funding Requests & Opportunities

- **Federal Funding Requests (2024): $125M**
  - Rebuilding American Infrastructure with Sustainability and Equity Grant Program (RAISE) - $25M
    - No Award
  - Low or No Emission Competitive Grant Program 5339(c)/Buses and Bus Facilities Competitive Grant Program 5339(a) - $100M
    - Clean Transit Advancement Campus – Construction Funds
    - No Award

- **Future Funding Opportunities:**
  - Low or No Emission Competitive Grant Program 5339(c)/Buses and Bus Facilities Competitive Grant Program
    - FY2025 applications are due July 14, 2025
  - Transit and Intercity Rail Capital Program (TIRCP)
    - Cycle 8 Call for Projects is likely expected in the Fall of 2025

ZEB Program Cost Summary for Transition

- **Cost**
  - CNG Bus
    - 40ft – approx. $758K
    - 60ft – approx. $1.2M
  - BEB
    - 40ft – approx. $1.1M
    - 60ft – approx. $1.7M
  - Cost of Hydrogen Bus
    - 40ft- approx. $1.6M
  - Infrastructure costs
    - $8M at SB for 24 charging positions
    - $21M at IAD for 30 charging positions
  - CTAC Cost estimate
    - $350M
  - Baseline vs Transition $833M



Upcoming Fiscal Challenges

Challenge

- Approaching a $100 million deficit
  - Fiscal cliff by early FY29
- Significant capital needs over next 5 years which includes ZEB implementation

Short-term Solution (Under the direction of MTS Board)

- Delay future ZEB vehicle purchases for FY25 & FY26
  - Utilize CARB's "early adopter" credits (25) accumulated from purchasing 25 BEBs before the mandate took effect
  - May seek waiver from CARB in FY27 if fiscal challenges persist

Fiscal Year 2026 Operating Budget
5-Year Projection ($000s)

	FY 2026 Budget	FY 2027 Projected	FY 2028 Projected	FY 2029 Projected	FY 2030 Projected
Operating Revenues	$ 121,090	$ 126,790	$ 130,718	$ 135,812	$ 139,992
Recurring Subsidy	243,984	247,282	252,369	258,766	265,676
Total Recurring Revenues	**$ 365,074**	**$ 374,071**	**$ 383,087**	**$ 394,578**	**$ 405,667**
Total Expenses	**473,079**	**492,440**	**511,033**	**530,844**	**551,535**
Structural Deficit	**$ (108,005)**	**$ (118,369)**	**$ (127,946)**	**$ (136,266)**	**$ (145,868)**
Reserves	62,086	124	201	246	297
Federal Stimulus	-	-	-	-	-
Shift from Capital to Ops	25,000	35,000	50,000	-	-
SB-125 Funding	20,919	83,245	77,745	15,900	-
Revenues Less Expenses	**$ -**	**$ -**	**$ -**	**$ (120,120)**	**$ (145,571)**

- Balanced through FY 2028, hit fiscal cliff in early FY 2029

Detail of Modifications to Purchase Plan

Board Approved modified Path

Approved February MTS Board Meeting (February 13, 2025)

- Use "Early Adoption" credits to delay ZEB purchases for FY25/26/27
- Request Exception for 2027 if necessary

FY 2025

- 13 40ft BEB's already being built (revenue service July 2025)

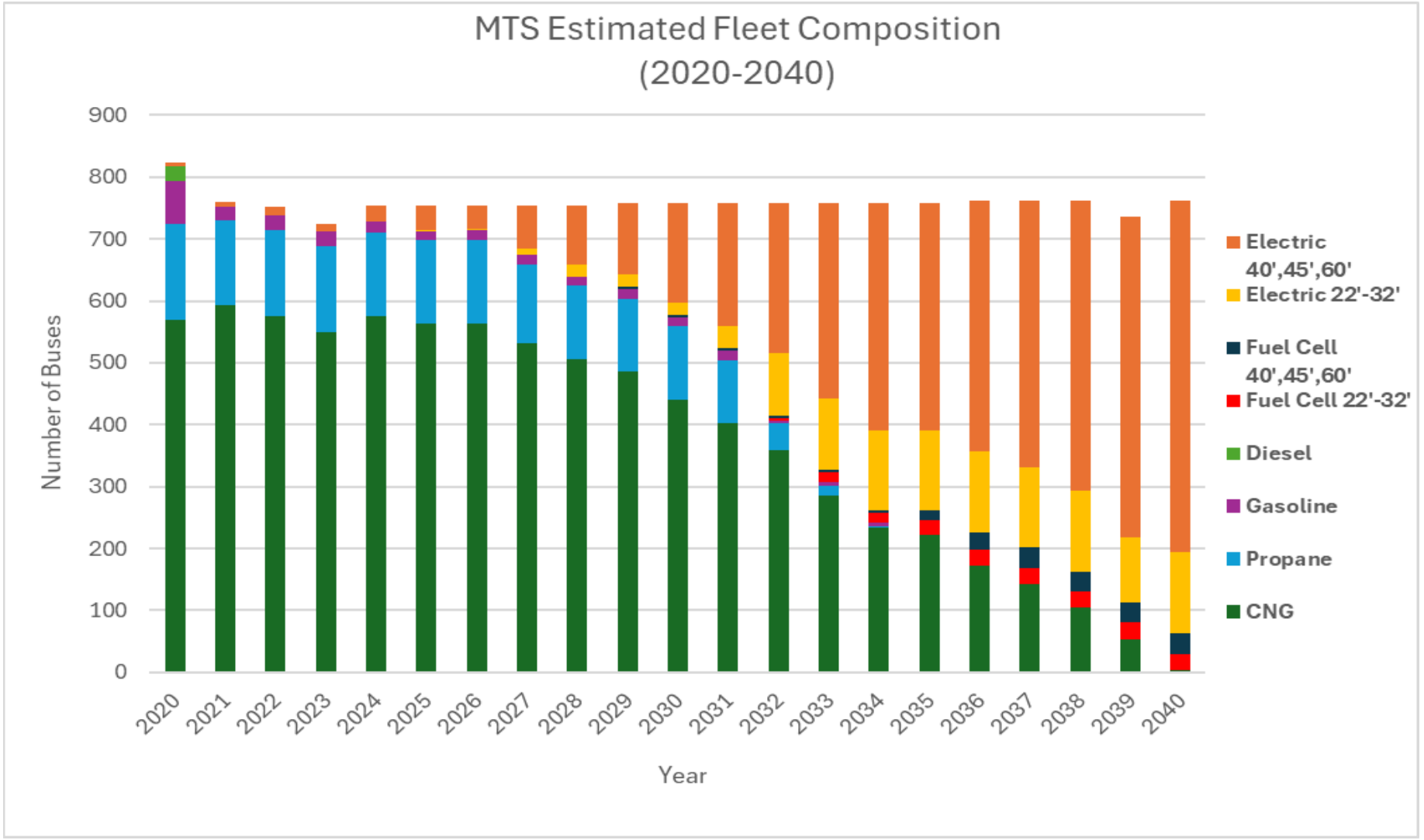
FY 2026

- 50 40ft buses to be ordered (October 2025) (50 CNGs)
- Use of 13 credits to meet 25% ZEB requirement and purchase 50 CNGs (est. 5 million savings)

FY 2027 (Requires CARB approval)

- 50 40ft buses to be ordered (after November 2026) 25 CNGs and 25 BEBS
- 13 60ft buses to be ordered (after November 2026) 6 CNGs and 7 BEBs
- 15 Paratransit vans to be ordered (after November 2026) 7 propane and 8 BEBs
    - Propose use of remaining credits and request a waiver from CARB for remaining 32 BEBs (est. $13.9 million savings)

25% Early Adoption Pathway



Lessons Learned

- Right path and on-track
- Technology progress
  - Slow range improvement
- Construction timeline
  - Equipment and materials
- Costs
  - Inflation and operating limitations
- Redundancy
  - No clear solution at scale yet
- Funding

Final Summary (Recap)

- Positive Outcomes
- Performance
- Funding
- Operating Costs
- Range Limitations
- Construction Timelines
- 2026 ICT Rule changes

Questions/Comments

Metropolitan Transit System

Agenda Item No. 27

MEETING OF THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
BOARD OF DIRECTORS

June 26, 2025

SUBJECT:

Revisions to MTS Board Policy No. 21, "MTS Revenue-Generating Display Advertising, Concessions, and Merchandise" (Mark Olson)

RECOMMENDATION:

That the San Diego Metropolitan Transit System (MTS) Board of Directors conclude the alcohol advertising pilot period and make permanent the revisions to MTS Board Policy No. 21, "MTS Revenue-Generating Display Advertising, Concessions, and Merchandise" (Attachment A) approved on June 15, 2023.

Budget Impact

Estimated revenue increase is approximately $100,000 to $200,000 annually, through vehicles and bus shelters and Trolley stations.

DISCUSSION:

The MTS Board of Directors has directed staff to review new and creative strategies to increase non-fare revenue. Sustainable sources of non-fare revenue are critical to help close the $120M annual budget deficit projected to begin in Fiscal Year (FY) 2029. MTS has collected approximately $15-$20M annually in non-fare revenue over the past five (5) years by leveraging its assets for advertising and related purposes.

In 2023, staff proposed that the restrictions on alcohol advertising in Board Policy 21 be modified to increase revenue received through MTS's Advertising Program. On June 15, 2023 (AI 22), the Board of Directors took the following action:

(1) Approved proposed revisions to MTS Board Policy No. 21 to remove the alcohol advertising prohibition on transit vehicles, Trolley stations, and transit centers;

(2) Directed staff to work with City of San Diego on amendments to applicable policies to allow alcohol advertising on bus shelters and benches within the City of San Diego;

(3) Pilot the policy changes for a two-year period, including responsible drinking messages on all alcohol brand specific advertisements along with reporting results in six months and

(4) Include data tracking of the location of the advertisements to ensure there are no disparities in disadvantaged communities.

Below is a summary of results and activity related to the Board direction.

Alcohol Advertising Sales

During the pilot period of the revised Advertising Policy, Clear Channel Outdoor (CCO), MTS's contractor who sells the advertising space on vehicles and shelters, executed five agreements related to alcohol advertisements:

- Breckenridge Distillery – Trolley wrap
- Dios Azul - Trolley wrap
- Smart and Final – Bus shelter advertisement
- Proximo Spirits – Bus shelter advertisement
- Cutwater Spirits– Bus shelter advertisement

The total gross revenue for the five advertising campaigns was $66,622.00. All advertisements included a responsible drinking message. There have been no alcohol advertising sales on the Trolley station inventory. Overall, sales have been slower than anticipated in the two years of the pilot due to increased number of brands diluting the market and the trend of decreased alcohol consumption. The market has also experienced a decrease in overall revenue in the alcohol vertical due to an increased number of brands.

While sales and revenue have been slower than anticipated, MTS has used this pilot period to execute promotional partnerships with two events where alcohol was promoted and taking transit (as opposed to driving) was highlighted – the La Jolla Wine Festival and La Mesa Oktoberfest.

To date there have been no complaints, comments or compliments received related to advertisements from the above-mentioned agreements.

City of San Diego and MTS Memorandum of Understanding (MOU)

On July 22, 2024, MTS and the City of San Diego signed a new MOU regarding bus shelter and bus bench advertising, installation and maintenance. (Attachment B.) The terms of the existing MOU were updated to remove the requirement that MTS advertising also follow the City's advertising policy.

The new MOU follows MTS' advertising policy, including allowing limited alcohol advertisements. The MOU defers to the MTS advertising policy as the guiding policy for all advertising sales on bus furniture within the City of San Diego limits. This policy is preferred by MTS because it provides a consistent advertising policy throughout the MTS service territory. It also provides alignment with other MOUs MTS has entered with other cities including El Cajon, Chula Vista, La Mesa, National City, Santee, Lemon Grove and the County of San Diego.

As part of the Board's approved revisions, Policy 21, Section 21.6.3, includes the following restriction on the proximity of alcohol advertisements to specified uses:

> Alcohol advertising shall not be placed on shelters or digital shelters within 500 feet from, or intended to be read from, the following: schools, public parks/playgrounds, church-recognized, established, or stand-alone places of worship, daycare/preschool, hospitals, and cemetery/funeral homes.

This policy has been strictly followed for all alcohol-related advertisements in the MTS system

Advertising Location Data Tracking

The two Trolley alcohol advertising wraps were deployed on the Orange and Green Line. The wraps were not deployed on the Blue Line. This is because Trolleys operating on the Blue Line are strictly the 5000 series. The two Trolleys with alcohol advertising were 4000 series vehicles.

The bus shelter alcohol advertisements were uploaded to all 60 locations in the digital bus shelter ad network, which are spread throughout the MTS service territory in high visibility locations.

MTS used CalEnviroScreen 4.0 to analyze the impact of alcohol advertisements on disadvantaged communities. CalEnviroScreen analyzes various factors like pollution levels, health data, and socioeconomic conditions to generate a score for each census tract in California. Areas with the highest scores (top 25% in CalEnviroScreen 4.0) are then designated as disadvantaged communities for SB 535 purposes.

Using this model, MTS determined that five out of the 60 digital shelter advertising locations, approximately 8%, are in disadvantaged communities as defined by CalEnviroScreen 4.0. Additionally, approximately 20-25% of the Trolley's Orange and Green Lines are in disadvantaged communities.

Based on this methodology and tracking data of the advertisement locations, MTS staff has determined the advertisements do not create disparities in disadvantaged communities.

In summary, while sales and revenue have been slower than anticipated, MTS's advertising partners feel they can build on the story of how transit's unique assets can work for brands on the national and local level. Staff believes that the additional revenue gained in this pilot is more of a floor than a ceiling. MTS has also had success creating a uniform policy by executing bus shelter and bench MOUs with various cities in the jurisdiction, including the City of San Diego. Lastly, while a small sample, it does not appear that alcohol advertisements on the MTS system will create a disparity in disadvantaged communities.

Recommendation

Based on the above, staff does not recommend any changes be made to Board Policy 21, as approved by the Board on June 15, 2023. Therefore, it is recommended that the Board conclude the alcohol advertising pilot period and make permanent the revisions to MTS Board Policy No. 21, "MTS Revenue-Generating Display Advertising, Concessions, and Merchandise" (Attachment A) approved on June 15, 2023.

/s/ Sharon Cooney
Sharon Cooney
Chief Executive Officer

Key Staff Contact: Julia Tuer, 619.557.4515, Julia.Tuer@sdmts.com

Attachments: A. MTS Board Policy No. 21
B. MTS-City of San Diego Bus Shelter & Bench Advertising MOU (MTS Doc. No. G2906.0-24)

Metropolitan Transit System

Policies and Procedures No. 21

Board Approval: 6/15/23

SUBJECT:

MTS REVENUE-GENERATING DISPLAY ADVERTISING, CONCESSIONS, AND MERCHANDISE

PURPOSE:

To establish a policy and guidelines concerning a revenue-generating advertising, concessions, and merchandise program encompassing trolley stations, San Diego Metropolitan Transit System (MTS) property and facilities, and selected printed materials.

Advertising on bus shelters and benches within the public rights-of-way shall be governed by the policies of the applicable jurisdiction. The City of San Diego policy is included as Attachment A.

BACKGROUND:

Public transit operators and administration agencies have historically utilized advertising, concessions, and merchandising programs to supplement operational and capital funds. A sound advertising and concessions program can be a viable, alternative income source while promoting transit use and ensuring rider convenience and safety. This policy advances the advertising program's revenue-generating objective while also prohibiting advertisements that could detract from that goal, such as by harming advertisement sales, reducing ridership or tarnishing's MTS's reputation. MTS's justifications for its advertising program and policy include:

1) Generating advertising revenue;
2) Increasing ridership by promoting MTS's services, programs and benefits;
3) Informing MTS riders of local, state or federal programs, services or benefits;
4) Preserving ridership by avoiding controversial content;
5) Preventing the risk of imposing controversial views on a captive audience;
6) Preserving the marketing potential of the advertising space by avoiding controversial content;
7) Maintaining a position of neutrality on matters of public debate; and
8) Reducing the risk of diversion of resources from transit operations that are caused by controversial content.

POLICY:

It is the policy of MTS that advertising spaces on MTS property, which includes the exterior and interior of buses and light rail vehicles (LRVs), bus benches, bus shelters, related transportation facilities, and selective digital and printed materials, shall constitute a non- public forum subject to uniform viewpoint-neutral restrictions. This policy has been drafted to ensure a non-public forum status on its advertising spaces and MTS staff will accordingly enforce this policy with that intention.

The following guidelines will be reviewed by staff to reflect the current policies of the MTS Board of Directors and to reflect changes in the trends of social and economic acceptance and appropriateness of various forms of advertising and concessions.

21.1 Advertising - Procedure

21.1.1 Safety, rider convenience, and information needs will take precedence over revenue generation.

21.1.2 Quantity, quality, and placement of all advertising will be controlled by and subject to the specific approval of MTS.

21.1.3 MTS reserves the right to reject any advertisement that does not meet the MTS Board of Director's standards as set forth in this policy.

21.1.4 Upon written demand by the Chief Executive Officer on stated grounds that shall be reasonable, any advertisement or other display deemed to be noncompliant with this policy shall immediately be removed. No refund shall be made for the time such objectionable material was on display.

21.1.5 MTS reserves the right to allow exceptions to the policy if MTS determines that application of the policy as written would likely be unconstitutional in any particular situation.

21.2 Advertising - Permitted Content

The subject matter for all advertising materials displayed on MTS property shall be limited to Commercial Speech. Commercial Speech is speech that: does no more than propose a commercial transaction; or is an expression related solely to the economic interests of the speaker and its audience (e.g. promotes for sale, lease or other financial benefit a product, service, event or other property interest). Notwithstanding the above general rule requiring Commercial Speech, the following content are allowed:

21.2.1 MTS Operations Advertising that promotes MTS transit services, programs or products, including co-sponsorships with third parties that would increase ridership or otherwise support MTS's mission.

21.2.2 Public Service Advertisements from Local, State or Federal Governmental Agencies regarding public programs, public services and public events that are not otherwise prohibited under this Policy.

21.3 Advertising – Prohibited Content

No advertisement will be permitted that in whole or in part:

a. intends to demean or disparage any individual, group, company, product or institution;

b. contains false, deceptive or grossly misleading information;

c. expresses or advocates an opinion, position or viewpoint on matters of public debate about economic, political, religious, social or moral issues;

d. directly or indirectly refers to religion;

e. is of a political or electoral nature;

f. portrays, solicits or condones acts of violence, murder, sedition, terrorism, vandalism, or other unlawful acts against any individual, group, animal, company or institution;

g. depicts nudity or portions of nudity that would be considered as pornographic, erotic or obscene. The rule of "public acceptance" should be used in such cases (i.e., if the advertisement has already gained public acceptance, then it may be considered as acceptable to MTS);

h. contains messages or graphic representations of adult entertainment, such as escort services, adult telephone services, adult internet sites and other adult entertainment establishments;

i. contains messages or graphic representations describing or suggesting explicit sexual acts, sexual organs, or excrement where such statements or words have as their purpose or effect of sexual arousal, gratification, or affront;

j. promotes the use or ingestion of or offers in commerce the sale of marijuana, tobacco, electronic smoking product or any other device that causes smoke, mist or vapor, firearms, or firearm-related products;

k. condones any type of discrimination;

l. contains profane language and/or appearance or suggestion of profane language;

m. contains any material that is an infringement of copyright, trademark or service mark;

n. implies or declares an endorsement of MTS of any service, product or point of view without written authorization from MTS;

o. depicts unsafe transit behavior aboard buses, trolleys, rail line tracks or other transit facility;

p. is reasonably foreseeable that it will result in harm to, disruption of, or interference with the normal operations of MTS's transportation system;

q. conflicts with any applicable federal, state, or local law, statute, or ordinance;

r. impedes vehicular or pedestrian traffic, restricts the visibility of directional/traffic signs and informational material, encroaches on necessary sight lines (e.g., driver/operator view of waiting patrons) or presents any other safety risks or hazards (e.g., flashing lights, sound makers, mirrors or other special effects);

s. contains a website address or telephone number that directs visitors or callers to material that violates any of the prohibitions within this policy; or

t. is mischaracterized as a commercial advertisement but upon examination is intended to distribute a non-commercial message.

21.4 Advertising – General Conditions

21.4.1 Advertising industry standard sizes will be used for all advertising treatments.

21.4.2 Advertising treatments will be maintained in "like-new" condition. Damage to the advertisement or its housing will be corrected within forty-eight (48) hours.

21.4.3 All advertisements shall clearly identify the sponsor(s).

21.5 Advertising - LRVs and Buses

21.5.1 LRVs and buses, may carry wrap advertising formats rather than conventional advertising formats, at the discretion of the Chief Executive Officer.

21.5.2 Transit information material may be placed inside LRVs and buses at the discretion of the Chief Executive Officer. Such information can include, in accordance with this policy, the promotion of regularly scheduled public transit routes that will serve major community events. The subject matter and proposed advertisement regarding such event must comply with the provisions set forth under this policy.

21.5.3 Super King and Mural formats are approved for acceptable use on buses. The size specification for the Super King is 226 inches x 30 inches and is placed between the front and rear wheel wells on the street side of the bus. Murals are defined as encompassing the space under the vehicle

passenger windows on each side of the bus and extending from the front of the bus to just past the rear wheel well.

21.6 Advertising - Transit Centers, Major Transit Points, Stations, and Stops

21.6.1 Advertising treatments (housings) will be designed to complement the architecture of the transit centers/stations and the flavor of the surrounding community. MTS plan specifications will be followed wherever applicable. Advertising treatments will be designed, constructed, and placed in accordance with all applicable local, state, and federal standards.

21.6.2 Any unsold display advertising space within transit centers, major transit points, and stations will be allocated for MTS related advertisements and displays.

21.6.3 Alcohol advertisement shall not be placed on shelters or digital shelters within 500 feet from, or intended to be read from, the following: schools, public parks/playgrounds, church-recognized, established, or stand-alone places of worship, daycare/preschool, hospitals and cemetery/funeral homes.

21.7 Advertising - Printed Materials

21.7.1 Advertising space may be allowed in printed materials (e.g., timetables, maps, and informational brochures) at the discretion of the Chief Executive Officer.

21.7.2 Advertising space may be allowed on the reverse side of regional passes, tickets, and transfers at the discretion of the Chief Executive Officer.

21.7.3 No advertising space shall supersede necessary transit information and/or regulations.

21.7.4 At the discretion of the Chief Executive Officer, MTS may allocate space in printed materials to inform transit customers about private entities actively participating in transit services (e.g., pass and ticket-sales outlets).

21.8 Concessions

21.8.1 Concession formats, quantity, and placement will be approved and controlled by the MTS Board of Directors.

21.8.2 Contracts for any concession format or related development will be awarded in accordance with existing MTS policies.

21.8.3 During hours of business, concessionaires will provide the public with transit information materials as directed and supplied by MTS or its designated representative.

21.8.4 Concession treatments/structures will be designed to complement the architecture of the transit centers/stations and the flavor of the surrounding community. MTS plan specifications will be followed wherever applicable. Concession treatments/structures will be designed,

constructed, and placed in accordance with all applicable local, state, and federal standards.

21.8.5 Concession treatments/structures will not impede vehicular or pedestrian traffic, will not restrict the visibility of directional signs and informational materials, and will not encroach on necessary sight lines.

21.8.6 Concessionaire contracts will include remittance to MTS on a monthly basis.

21.8.7 Any and all concession on-site signing and displays will be in accordance with existing MTS policies and subject to approval of the Chief Executive Officer.

21.9 Merchandise

21.9.1 Any and all system-related merchandise will be of the highest available quality and project a positive transit image.

21.9.2 Merchandise licensing agreements and royalty payments will be made in accordance with existing MTS policies.

21.10 Revenue

All revenue received from any form of advertising shall be accrued according to MTS policy and allocated during the annual budget process.

21.11 Contractor Services

MTS may engage contractor(s) services for the development, implementation, management, and maintenance of advertising, concessions, and/or merchandise programs in conformance with existing MTS Board of Directors policies and in the best interests of MTS.

Attachment A – City of San Diego Advertising Policy

Original Policy approved on 5/9/1983.
Policy revised on 6/6/1985.
Policy revised on 7/9/1987.
Policy revised on 6/23/1988.
Policy revised on 3/22/1990.
Policy revised on 3/14/1991.
Policy revised on 4/9/1992.
Policy revised on 5/12/1994.
Policy revised on 8/11/1994.
Policy revised on 6/22/1995.
Policy revised on 3/27/1997.
Policy revised on 6/11/1998.
Policy revised on 2/22/2001
Policy revised on 2/26/2004.
Policy revised on 12/10/2009.
Policy revised on 6/18/2015
Policy revised on 1/18/2018
Policy revised on 4/12/2018
Policy revised on 6/15/2023 for a pilot period of two (2) years

ATTACHMENT A

MTS POLICY NO. 21

CITY OF SAN DIEGO
ADVERTISING POLICY

Subject:

ADVERTISING ON BUS STOP SHELTERS AND BENCHES

Background:

The City of San Diego (City) entered into a Memorandum of Understanding (MOU) with the Metropolitan Transit Development Board (MTS), adopted July 25, 1988, and amended February 25, 1991, and June 21, 1999, authorizing MTS to install bus stop shelters and bus benches in public rights-of-way in the City. Pursuant to the MOU, MTS contracted with third parties for the construction, installation, and maintenance of the bus stop shelters and benches. In exchange, MTS's contractors receive the proceeds from the sale of advertising space on the shelters and benches.

MTS regulated the content of the advertising placed on the bus stop shelters and benches according to its Policies and Procedures No. 21. After advertising containing a religious message was removed pursuant to that policy, valid concerns were raised that the policy may violate due process and first amendment rights governing public speech.

Purpose:

It is the intent of the City Council to establish a policy governing advertising on bus stop shelters and benches in the public rights-of-way within the City that will be included by amendment in the MOU between the City and MTS, and administered by MTS.

It is the further intent of the City Council to prohibit advertising on bus stop shelters and benches of alcoholic beverages, tobacco products, and firearms in recognition of the fact that many public transit patrons are minors, that possession of these products by minors is illegal and dangerous, and that advertising is a persuasive medium for encouraging the use of these products by minors.

This policy applies only to advertising space located in designated areas on bus stop shelters and benches, as described in the MOU between the City and MTS.

Policy:

Advertising on Bus Stop Shelters and Benches:

1. In its agreement with its advertising contractors, MTS shall reserve the right to reject any advertisement, commercial or noncommercial, which does not meet the standards set forth in this policy.

2. All advertising posted on bus stop shelters and benches must conform to the following criteria:

A. Defamatory Advertising. No advertising will be permitted that falsely disparages any person, product, or company, or that is likely to damage the reputation of any person, product, or company.

B. Advertising Condoning Criminal Conduct. No advertising will be permitted that is likely to incite or produce imminent unlawful activity.

C. Obscene Advertising. No advertising will be permitted that contains obscene matter or matter harmful to minors, as defined in California Penal Code Sections 311 and 313.

D. False Advertising. No advertisement will be permitted that contains false or grossly misleading information.

E. Alcohol, Tobacco, and Firearms. No advertisement will be permitted that promotes the sale of alcoholic beverages, tobacco or tobacco products, or firearms.

F. Existing Laws. All advertisements must conform to applicable federal, state, and local laws.

3. The City may make demand upon the Chief Executive Officer of MTS for the removal of any advertisement, commercial or noncommercial, that does not conform to this policy. Such demand shall be in writing and shall state reasonable grounds for the demand. MTS shall consider and act upon the demand in accordance with this policy.

Metropolitan Transit System

CONTRACT DOCUMENT LOG SHEET
GENERAL
Updated 3/6/24

Contractor Information

City of San Diego
Attn: Everett Hauser, Program Manager
Phone: erhauser@sandiego.gov
Email: (619) 533-3012

Contract #: G2906.0-24
Purchase Order #: N/A
Prevailing Wage? (Y/N): N
Total Board Approval Amount: $0.00

Amendment #:
Purchase Requisition #: N/A
Is this a New Vendor? (Y/N): N/A

Agenda Item #: 24
Board Approval Date: 4/25/2024

Current Contract Value:
Amendment Amount: $0.00
*Use Tax (*MTS Pays Directly*): $0.00
Total Amendment Cost *(Amendment + Use Tax)*: $0.00

Final Total Contract Value *(Current Contract + Total Amendment)*:

**As applicable only*

Type of Funds Used (Check all that apply):

☐ Local | ☐ Federal: FTA | ☐ Other Federal: _____ | ☐ State | ☐ Other State - TIRCP | ☑ Other: Revenue

Type of Contract (Check all that apply):

☐ Expenditure | ☐ Revenue | ☐ No Cost/In Kind: _____ | ☐ Lease Agreement | ☑ Other: MOU

Description:

The MTS Board of Directors have approved he Revenue contract for Bus Bench/Shelter advertising. Contract # G2906.0-24 for up to 10 years. (5 base years and 5 option years.). Advertising revenue on benches and shelters are shared with the City of San Diego, as detailed in agreement.

OPERATIONS ONLY Department/Acct Code	**CIP ONLY** Project/Task Detail	**BUDGET DISTRIBUTION** Amount
902010/200040		
		$0.00

Base Contract Term: 5/18/2024 to 12/31/2029

Option Years:

OY 1	1/1/2030	to	12/31/2030	OY 4	1/1/2033	to	12/31/2033
OY 2	1/1/2031	to	12/31/2031	OY 5	1/1/2034	to	12/31/2034
OY 3	1/1/2032	to	12/31/2032	OY 6		to	
				Extension		to	

Completion Date:

Method of Procurement: ☐ RFP | ☐ IFB | ☐ RFQ | ☐ Sole Source | ☑ Other: _____

Agreement Type: ☐ Services | ☐ Goods/Equipment/Commodities | ☐ Lease | ☑ MOU/Other: _____

Insurance MyCOI: ☐ Yes ☑ No

Project Manager: Mark Olson (Name)

Contract Officer: N/A (Name)

For Contract Specialist Use Only

Contract Emailed to Vendor: **Date:**

Executed Contract Received: **Date:** 7/23/24 CF

DIR Registration: **Date:**

Review/Approval Initials:

1. Project Manager	MO	Date:	7/10/2024
2. Director/COO	MO	Date:	7/10/2024
3. Procurement Mgr	CA	Date:	7/10/2024
4. Finance (Capital Projects) **		Date:	
5. Finance (Budget)	MT	Date:	7/10/2024
6. Finance (CFO)	MT	Date:	7/10/2024
7. General Counsel	SL	Date:	7/15/2024
8. CEO	SC	Date:	7/15/2024

***As applicable only*

Routing Notes:

Metropolitan Transit System

MTS Doc. No. G2906.0-24

MEMORANDUM OF UNDERSTANDING (MOU)
BETWEEN THE CITY OF SAN DIEGO
AND THE SAN DIEGO METROPOLITAN TRANSIT SYSTEM
REGARDING BUS SHELTER AND BUS BENCH ADVERTISING

This MOU, dated 7/22, 2024, is entered into by and between the CITY OF SAN DIEGO (CITY), a municipal corporation, and the SAN DIEGO METROPOLITAN TRANSIT SYSTEM (MTS), a public entity (also known as San Diego Metropolitan Transit Development Board or MTDB).

RECITALS

A. MTS is the statutorily designated public transit provider for the portion of San Diego County that includes the CITY, as set forth in Public Utilities Code section 120000, *et seq.*;

B. Pursuant to Public Utilities Code section 120244, MTS is "entitled to the benefit of any reservation or grant, in all cases, where any right has been reserved or granted to any public agency to construct or maintain roads, highways, or other crossings over any public or private lands" and operates and maintains certain public transit services and infrastructure in CITY streets under this authority;

C. MTS and CITY are authorized by Public Utilities Code section 120268 to enter into cooperative agreements to establish uniform policies and procedures governing the use of bus passenger loading zones and establishing responsibility and standards for the maintenance of bus loading zones and any associated improvements;

D. MTS and CITY had a Memorandum of Understanding (MTS Doc. No. G1124.2-08) dated July 30, 2008 (2008 MOU), which expired December 31, 2023, in which the CITY gave MTS the exclusive authority to install, or cause to be installed, transit furniture within the public right-of-way of the CITY;

E. Notwithstanding the expiration of the 2008 MOU, in order to improve transit amenities for its passengers, including CITY residents and visitors, MTS has continued to install, maintain and replace bus furniture at locations where ridership is sufficiently high;

F. MTS has recently installed new transit shelters with solar lighting and receptacles for trash and recycling;

G. MTS has recently installed new bus benches that will improve the streetscape of the CITY;

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MTS Doc. No. G2906.0-24

H. MTS has a third-party contract for installation, maintenance and advertising at transit furniture locations throughout MTS's jurisdiction, including within CITY;

I. The revenue generated from the MTS advertising contracts is intended to fund the maintenance and purchase of transit shelters and benches, as well as to fund continued transit services within MTS's jurisdiction, including the CITY; and

J. MTS and CITY desire to enter into a new MOU to formally acknowledge their cooperative agreement regarding bus stop improvements within the CITY.

AGREEMENT

NOW, THEREFORE, the CITY shall grant to MTS the exclusive authority to install, or cause to be installed, transit shelters and benches within the public-right-of-way of the CITY, provided the following conditions are complied with by MTS:

1. Location Criteria for Transit Shelters and Transit Bus Benches

a. Transit shelters and bus benches *with advertising* shall be permitted only in commercial, industrial or multifamily zoned areas and will not be permitted in single family residentially zoned areas without the specific written authorization of the CITY.

b. Transit shelters and bus benches *without advertising* shall be permitted in all areas where an MTS bus stop is located, so long as CITY has not exercised its authority under this subsection 1(d) or (f) below to reject a proposed transit shelter or bus bench location or to request the removal of an existing transit shelter or bus bench.

c. As transit shelter and bus bench maintenance contracts depend on advertising revenue to be sustainable, CITY shall allow a ratio of at least 4-to-1 advertising to non-advertising shelters and benches.

d. CITY, through the City Manager, shall have final authority to approve or deny the installation of any transit shelter or bus bench notwithstanding the fact that any proposed installation otherwise complies with the terms of this agreement; provided, however, that MTS shall not be required by CITY to install a transit shelter or bus bench at any specific location.

e. MTS shall provide a list of existing locations of all bus benches and transit shelters to the CITY. All installations shall conform to the terms of this MOU.

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f. The CITY shall have the authority to cause a transit shelter or bus bench to be removed or relocated from any location at no cost to the CITY, upon making written demand to MTS for such removal.

2. Advertising Policy and Permissible Signage

a. Transit shelter advertising is typically limited to two advertising panels that do not exceed four feet in width and six feet in height. Other permissible advertising includes digital advertising and "wrap" materials that are applied to the shelter structure.

b. All advertising shall comply with MTS Policy No. 21 titled "MTS REVENUE-GENERATING DISPLAY ADVERTISING, CONCESSIONS, AND MERCHANDISE," attached as Exhibit A, which may be revised from time-to-time by the MTS Board of Directors in its sole discretion.

c. The CITY may request that MTS exercise its right to remove any advertisement, commercial, or noncommercial that does not conform to MTS Policy No. 21. Such demand shall be in writing and state reasonable grounds for the demand. MTS shall consider and act upon the demand in accordance with the policy and legal requirements.

3. Maintenance

a. MTS, through its Contractors, shall be responsible for providing ongoing maintenance for every transit shelter or bench which it caused to be installed and currently exists in the public right-of-way.

b. Transit shelters and bus benches shall be maintained in a state of good repair throughout the life of this agreement, and such services shall include, but not be limited to, refurbishing, reconditioning, and replacing worn or damaged transit shelters or bus benches if necessary.

c. Routine inspections and trash removal shall be performed.

d. Transit shelters and bus benches shall be repaired, removed, or replaced within 48 hours of notification to MTS of any damage, vandalism, or graffiti found on any transit shelter or bus bench.

4. Notices. MTS shall use its best efforts to notify the underlying property owners, as indicated on the most recent tax assessor's rolls, and building occupants that a new transit shelter or bus bench with or without advertising is proposed to be installed within

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100 feet of their property in the public right-of-way prior to any transit shelter installation. Such notice will not be required if a shelter or bus bench currently exists and is simply being replaced by a new shelter or bus bench unless it is significantly modified.

5. Permits. New transit shelters shall not require any permit from the CITY. MTS's contractor will be required to comply with all rules, regulations, and laws of the CITY and any applicable state or federal laws.

6. Electrification. Notwithstanding Section 5 above, MTS's contractor will secure all electrical permits necessary for the installation of new shelters. Solar-powered shelters shall not require any permit, MTS's contractor shall assume all costs associated with lighting and powering transit shelters.

7. Revenue

a. MTS may derive revenue from the sale of advertising on its transit furniture. MTS will administer the transit furniture program (the "transit furniture program" collectively includes the MTS program of procuring and installing transit shelters and benches, maintenance of such shelters and benches, sale and display of advertising on certain shelters and benches, and the hiring and selection of contractors and vendors to assist in these tasks). Prior to the revenue share provisions set forth below, MTS shall first be entitled to recover all costs to administer the transit furniture program.

b. Revenue Share with CITY. MTS agrees to pay to CITY net revenue generated from advertising under this MOU as follows:

i. "Net revenue" shall be defined as the gross revenue share received by MTS under its transit shelter and bus bench advertising contracts, less the costs to administer the transit furniture program. Net revenue shall be further limited to revenue less expenses that are directly related to shelters and benches located on CITY right-of-way. In the event a major capital expenditure is planned as part of the transit furniture program, MTS may deposit the CITY's net revenue into a reserve / capital account to accumulate sufficient funding for the CITY's pro rata portion of the transit furniture program capital expense. Upon request, MTS shall provide the CITY with a report on the transit furniture program costs and planned projects, including any net revenue being held in reserve to fund the program.

ii. The CITY share of net revenue shall be 10% for shelter advertising and 50% for bench advertising. The MTS share of net revenue shall be 90% for shelter advertising and 50% for bench advertising.

iii. Unless being held in a reserve account for a future transit furniture program expense under section 7(b)(i), MTS shall pay to CITY its net revenue share set forth in section 7(b)(ii) in quarterly installments.

iv. CITY agrees to program all revenue received from MTS under this MOU into its Capital Improvement Program for the following fiscal year. All revenue received under this MOU by CITY shall be spent on the installation of concrete bus pads, Americans with Disabilities Act improvements or other transit improvements mutually agreed upon by the parties at or near bus stop locations selected by and located in the CITY.

8. CITY and Private Furniture

a. Notwithstanding that the CITY has granted to MTS the exclusive authority to install bus benches and transit shelters within the public right-of-way in the CITY, MTS agrees to allow the CITY to authorize others to place transit shelters, benches and appurtenances in the public right-of-way conditioned upon those shelters, benches, and appurtenances being placed in such locations as the CITY and MTS may agree to from time to time.

i. Process. Private entities authorized to install transit shelters, benches, and appurtenances pursuant to this amendment will be required to provide the design, construction, and maintenance for the shelter and bench. Installation will be permitted through a CITY encroachment permit process. The location of the shelters or benches shall conform to the MTS Design Standard Guidelines. MTS will provide the plan review for comment, but will not be responsible or liable for design, construction, or maintenance of the transit shelters or benches that are not installed as part of its existing shelter or bench contract.

ii. Indemnity. The CITY undertakes and agrees to defend, indemnify, and hold harmless MTS and any and all of MTS's officers, agents, employees, assigns, and successors in interest from and against all suits and causes of action, claims, losses, demands, and expenses including, but not limited to: attorney's fees and costs of litigation, damage or liability of any nature whatsoever for death or injury to any person including CITY employees and agents, or damage or destruction of any property of either party hereto or any third person in any section on the part of the CITY or its permitted private entities whether or not contributed to by an act or omission whether passive, active, or

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otherwise except for the sole negligence of MTS or any of MTS's officers, agents, and employees, in which case MTS shall hold the CITY harmless.

iii. Advertising. Advertising on the CITY's shelters or benches shall be solely for the purpose of announcing events of noncommercial nature taking place at an adjacent public facility owned or operated by the private entity authorized to install the shelter or bench and shall not be used for posting schedules of public meetings at the facility. Advertising space shall not be leased to any third party. Acknowledgement of sponsorship shall be permitted within the space reserved for advertising posters. All advertising posted on the shelters and benches must conform to the advertising criteria set forth in Section 2 of this agreement. MTS may make demand upon the CITY for the removal of any advertisement that does not conform to the aforementioned advertising criteria. Such demand shall be in writing and shall state reasonable grounds for the demand. The CITY shall consider and act upon the demand in accordance with those advertising criteria. Advertising display panels shall be configured in such a way to be similar to MTS's shelters and benches. Advertising display panels shall be no greater in size than those used in MTS's shelters and benches. MTS shall be given first-right-of-refusal to utilize one advertising panel in each shelter for the purpose of posting transit information.

iv. Insurance. The CITY shall require any permitted private entity to maintain insurance to same extent required of MTS pursuant to this Memorandum of Understanding.

v. Maintenance. For pre-existing and future benches, shelters, trash receptacles, and other bus stop infrastructure and amenities not installed by MTS: MTS does not assume any responsibility in this MOU for repairs, maintenance, cleaning, installation, replacement, removal, trash and recycling service, graffiti abatement, painting, or any other work not agreed to elsewhere. MTS will not be responsible for damage caused by furniture and amenities installed by the City or others (apart from MTS and/or its designees), nor for the restoration of the area to City standard from any condition caused by the installation, damage, repair, or removal of any such infrastructure.

MTS shall maintain responsibility for all work related to the bus stop pole (if any), bus stop blade, and any MTS-provided information or amenities attached to the bus stop pole, including installation, repair, replacement, removal, cleaning, and

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graffiti abatement. MTS shall be responsible for MTS-provided and installed benches and shelters as specified in this agreement.

9. Hold Harmless. MTS undertakes and agrees to defend, indemnify, and hold harmless the CITY and any and all of the CITY's officers, agents, employees, assigns, and successors in interest from and against all suits and causes of actions, claims, loss, demands, expenses, including, but not limited to, attorneys' fees and costs of litigation, damage or liability, or any nature whatsoever, for death or injury to any person, including MTS's employees and agents, or damage or destruction to any property of either party hereto or third person in any manner arising by reason of or incident to the performance of this MOU on the part of MTS, except for active negligence of the CITY or any of the City's officers, agents, contractors or employees, in which case the CITY shall hold MTS harmless and MTS shall have no obligation to defend and indemnify the CITY or its officers, agents, employees, assigns or successors.

10. Termination of this MOU.

a. By CITY: The CITY may terminate this MOU if MTS or its contractor materially breaches the terms and conditions set forth herein, and the CITY shall owe no payment to MTS or its contractor. In the event the CITY terminates this MOU, the CITY may require MTS to remove every transit shelter and/or bus bench in the public rights-of-way. The City may terminate this MOU without cause, by serving upon MTS written notice of termination of this MOU three hundred sixty five (365) days in advance of said date of termination, and the CITY shall pay MTS the current value for every transit shelter or bus bench in the public right-of-way.

The method of calculating the current value of a transit shelter or bus bench will be as follows:

$$\text{CURRENT VALUE} = \frac{\left[\text{Transit Shelter/Bus Bench Unit Price}\right]}{\text{Depreciation Period (in months)}} \left[\text{Depreciation Period (in months)} - \text{Months in Service}\right]$$

For purposes of calculating the current value the transit shelter or bus bench:

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- the unit price shall be the unit price listed in the contractor's financial plan submitted with the bid documents plus the installation costs of the bus bench or transit shelter;

- the depreciation period for transit shelters and bus benches will be ninety-six (96) months; and

- the number of months in service will be calculated from the date the transit shelter or bus bench is placed in service to the date of termination.

b. By MTS: MTS may terminate this MOU without cause, by serving upon CITY written notice of termination of this MOU three hundred sixty five (365) days in advance of said date of termination. No later than the date of termination, MTS shall either (i) reach an agreement with CITY for CITY to take possession and ownership of the transit shelters and bus benches that remain installed within the CITY, or (ii) remove each and every transit shelter and bus bench and restore the sidewalk to a safe and usable condition.

11. Insurance. During the term of the agreement, MTS shall require its contractor to maintain the following levels and types of insurance:

a. Comprehensive general liability insurance for bodily injury (including death) and property damage, which provides total limits of not less than two million dollars ($2,000,000.00) combined single limit per occurrence. Coverages included shall be:

i. Premises and operations;

ii. Contractual liability expressly, including liability assumed under this agreement, with deletion of the exclusion as to performance of operations within the vicinity of any railroad bridge, trestle, track, roadbed, tunnel, underpass, and crossway;

iii. Personal injury liability;

iv. Independent contractors; and

v. Cross-liability clause providing that the insurance applies separately to each insured except with respect to the limits of liability.

vi. Such insurance shall include the following endorsement (copies of which shall be provided):

(1) Inclusion of the CITY, its officers, agents, and employees as additional insureds with respect to activities, services, or operations under this agreement;

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(2) Inclusion of MTS, and its subsidiaries, its officers, agents, and employees as additional insureds with respect to activities, services, or operations under this agreement; and

(3) Stipulation that the contractor's insurance is primary insurance and that no insurance of the CITY or MTS will be called upon to contribute to a loss.

b. Comprehensive automobile liability insurance for bodily injury (including death) and property damage, which provides total limits of not less two million dollars ($2,000,000.00) combined single limit per occurrence applicable to all owned, non-owned, and hired vehicles.

c. Statutory workers' compensation coverage including a broad form all states endorsement; employer's liability insurance for not less than one million dollars ($1,000,000.00) per occurrence for all individuals engaged in services or operations to implement this agreement, including an insurer's waiver of subrogation in favor of the CITY, their directors, officers, representatives, agents, and employees.

d. MTS shall also provide CITY with satisfactory evidence of self-insurance that meets or exceeds the types and levels of insurance outlined above.

Notices. No notice, request, demand, instruction, or other document to be given hereunder to any party shall be effective for any purpose unless personally delivered to the person at the appropriate address set forth below (in which event, such notice shall be deemed effective only upon such delivery) or delivered by certified mail, return receipt requested, as follows:

To The CITY:
Kris McFadden
Deputy Chief Operating Officer
City of San Diego
202 C St., Suite 900
San Diego, CA 92101

To MTS:
Sharon Cooney
Chief Executive Officer
Metropolitan Transit System
1255 Imperial Avenue, Suite 1000
San Diego, California 92101

Notices so mailed shall be deemed to have been given forty-eight (48) hours after the deposit of same in any United States Post Office mailbox. The addresses and addressees, for the purpose of this paragraph, may be changed by giving written notice of such change in the manner herein provided for giving notice. Unless and until such written notice of change is received, the last address and addressee stated by written notice, or provided herein if no such written notice of change has been received, shall be deemed effective.

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12. No Waiver. The waiver by one (1) party of the performance of any covenant, condition, or promise shall not invalidate this MOU nor shall it be considered a waiver by such party of any other covenant, condition, or promise hereunder. The waiver by either or both parties of the time for performing any act shall not constitute a waiver of the time for performing any other act or identical act required to be performed at a later time. The exercise of any remedy provided by law and the provisions of this MOU for any remedy shall not exclude other consistent remedies unless they are expressly excluded.

13. Severance. If any provision of this MOU is found to be unenforceable, the remainder of the provisions shall continue to be given full force and effect.

14. Amendments. No change in or addition to this MOU or any part hereof shall be valid unless in writing and properly authorized by the CITY and MTS.

15. Term. This MOU shall commence upon approval. MTS shall have the right to administer its transit shelter and bus bench programs through December 31, 2034. After December 31, 2034, this MOU shall continue on a year-over-year basis unless terminated by either party pursuant to Section 10, or new terms are defined and agreed to in writing by both parties.

SAN DIEGO METROPOLITAN TRANSIT SYSTEM

Sharon Cooney Digitally signed by Sharon Cooney Date: 2024.07.16 11:17:25 -07'00'

Sharon Cooney
Chief Executive Officer

APPROVED AS TO FORM:

Samantha Leslie Digitally signed by Samantha Leslie Date: 2024.07.15 14:09:40 -07'00'

for Karen Landers
General Counsel

Date: 7/15/2024

CITY OF SAN DIEGO

Kris McFadden Kris McFadden, DCOO 07/22/2024

By: Kris McFadden
Title: Deputy Chief Operating Officer

APPROVED AS TO FORM:

City of San Diego City Attorney's Office

Date: 7/22/2024

Metropolitan Transit System

Revisions to MTS Board Policy 21, "MTS Revenue-Generating Display Advertising, Concessions, and Merchandise"

Board of Directors

Background

MTS Board Policy No. 21 sets forth MTS's Advertising Program

- Applies to vehicles, stations and certain bus benches/shelters, depending on the jurisdiction
- All subject matter must be limited to commercial speech, public service announcements by public agencies, or MTS marketing content
- Primary objective is to generate revenue
- Prohibits any content that could detract from this goal (e.g. harm MTS's marketing potential, tarnish MTS's reputation, or impose matters of public debate or controversial views)

Ad Policy Pilot Direction

In 2023 the Board directed staff to do the following:

1. Remove alcohol ad prohibition for 2 years
2. Work with City of San Diego on policy amendments to allow alcohol advertising on bus shelters and benches (90% inventory in City of SD)
3. Require responsible drinking messages
4. Include data tracking of the location of advertisements to ensure there are no disparities in disadvantages communities

Pilot Results - System Advertising

Executed Agreements (5):

- Breckenridge Distillery (Trolley wrap)
- Dios Azul (Trolley wrap)
- Smart and Final, Proximo Sprits, Cutwater Spirits (shelter digital ads)

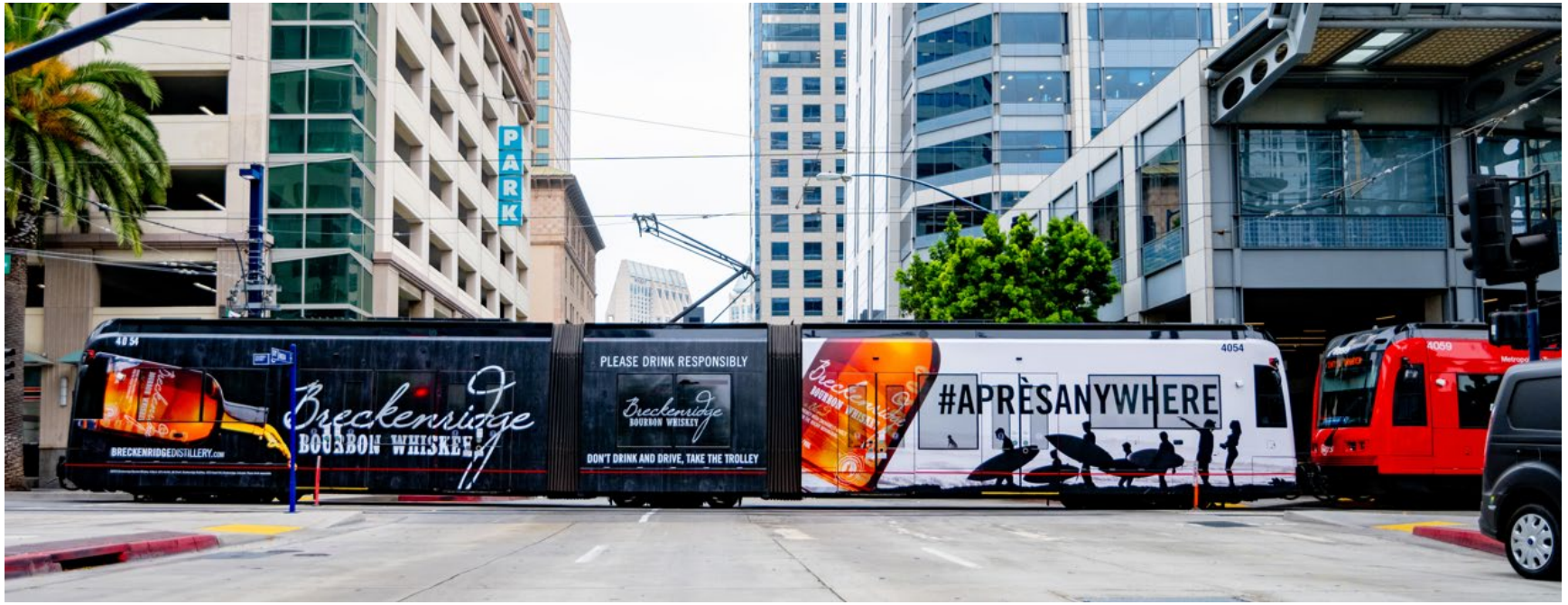
Revenue Generated:

$66,622 gross

- Responsible messaging included
- No public complaints or feedback received

System Advertising

Breckenridge Distillery



System Advertising

Dios Azul

System Advertising

Smart and Final

System Advertising

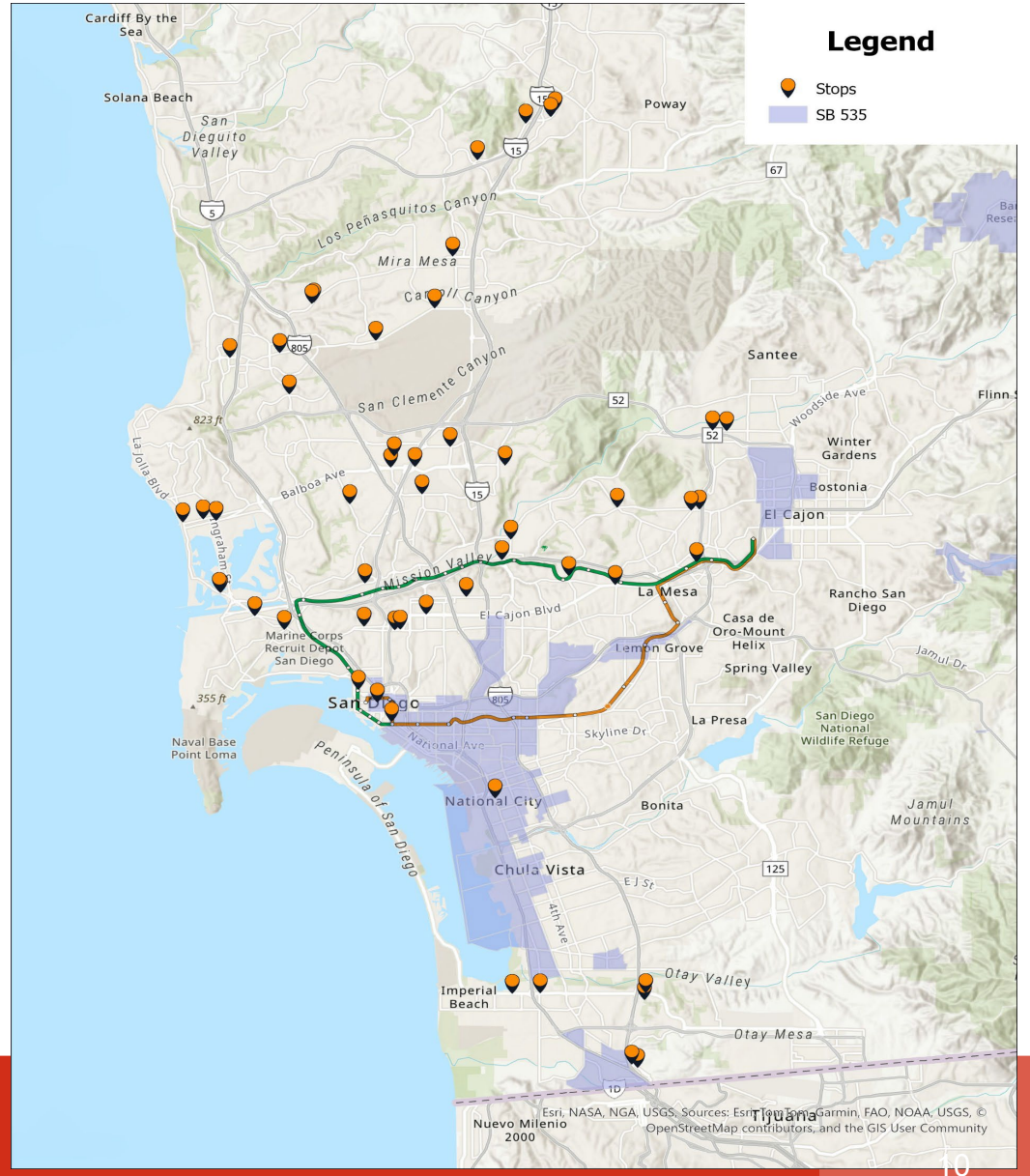
La Mesa Oktoberfest

City of San Diego MOU

- 10-year agreement (July 22, 2024) to manage advertising, installation and maintenance of bus shelters and benches in City
- Removes requirement to also follow City advertising policy; allows consistent advertising requirements across MTS territory
- Approx. 90% of all MTS shelters and benches are in City of San Diego
- City revenue share must be used for capital improvements in support of transit

Disadvantaged Communities Tracking

- No indication of disproportionate impact in Disadvantaged Communities (DACs)
- SB 535 California Disadvantaged Communities Model (CalEnviroScreen 4.0)
- 5 out of 60 digital ad locations in DACs (~8%)
- ~20-25% of Orange and Green Lines pass through DACs



Summary

- Revenue lower than projected, but expected to grow
- No complaints, no disparities in ad placement
- MTS continues aligning ad policy regionally for consistency
- Staff recommends permanent adoption of revised policy

Board Recommendation

Conclude the alcohol advertising pilot period and make permanent the revisions to MTS Board Policy No. 21, “MTS Revenue-Generating Display Advertising, Concessions, and Merchandise” approved on June 15, 2023.