

**SECOND AMENDMENT TO
INTERGOVERNMENTAL AGREEMENT BETWEEN THE TRANSBAY JOINT
POWERS AUTHORITY AND THE SAN FRANCISCO MUNICIPAL
TRANSPORTATION AGENCY**

This Amendment is made this _____ day of _____, 2013, in the City and County of San Francisco, State of California, by and between the Transbay Joint Powers Authority (the "TJPA") and the City and County of San Francisco, a municipal corporation (the "City") acting by and through its San Francisco Municipal Transportation Agency ("SFMTA").

RECITALS

WHEREAS, SFMTA and the TJPA have entered into an Intergovernmental Agreement dated July 21, 2009, for Traffic Engineering, overhead contact system ("OCS") Design, and Construction Management services related to the Temporary Transbay Terminal, demolition of the Existing Terminal, Utility Relocation, Bus Storage Facility, and Transit Center work for the Transbay Transit Center Project and related structures ("Agreement"); and

WHEREAS, SFMTA and the TJPA entered into a First Amendment to the Agreement on August 9, 2010, adding SFMTA Parking Control Officer services for the operation of the Temporary Transbay Terminal during key commute hours to the scope of work, increasing the contract amount, and extending the term of the Agreement; and

WHEREAS, SFMTA and the TJPA desire to further amend the Agreement on the terms and conditions set forth herein;

NOW, THEREFORE, the TJPA and the SFMTA agree as follows:

- 1. Definitions.** The following definitions shall apply to this Amendment:
 - a. Agreement.** The term "Agreement" shall mean the Intergovernmental Agreement between the Transbay Joint Powers Authority and the San Francisco Municipal Transportation Agency, dated July 21, 2009, including the First Amendment to the Agreement, dated August 9, 2010.
 - b. Other Terms.** Terms used and not defined in this Amendment shall have the meanings assigned to such terms in the Agreement.
- 2. Modifications to the Agreement.** The Agreement is hereby modified as follows:
 - a. Section I, "Scope of Services."**

Section I shall be amended to add the following services to be provided under the Agreement:

 - A.** For construction of the Temporary Terminal, the SFMTA shall provide to the TJPA construction management, OCS inspection and engineering support services. The SFMTA shall also provide and install traffic signage, street striping and parking meters.
 - B.** For demolition of the Existing Terminal, the SFMTA shall provide to the TJPA OCS design, construction management, OCS inspection and engineering support services. The SFMTA shall also provide traffic engineering services.
 - C.** For Utility Relocation, the SFMTA shall provide to the TJPA project management, engineering support services, and traffic planning, including project management, planning and coordination, construction management support, and

inspection services for a Muni Traction Power duct bank to accommodate Muni cables supplying power for the reconfigured OCS at the Transit Center.

D. For construction of the Transit Center, the SFMTA shall provide to the TJPA project management, traffic planning, traffic engineering, and shop services, and on-going planning, coordination, and engineering.

E. For construction of the Bus Storage Facility, the SFMTA shall provide to the TJPA traffic engineering and shop services, project management, planning and coordination, engineering, construction management support, and inspection services.

F. For installation and removal of the Temporary Bridge (interim roadway structure required for the construction of the Transit Center below grade concrete box structure), the SFMTA shall provide to the TJPA project management, construction management, inspection, and engineering support services for the OCS, and traffic engineering support services related to the temporary bridge installation and removal for the Transit Center.

H. For construction of Bus Ramps, the SFMTA shall provide traffic engineering services.

Specifically, the required additional work to be performed by the SFMTA through the Capital Programs and Construction and Sustainable Streets Divisions under this Second Amendment to the Agreement is set forth as follows:

- Amended Exhibit A3 Utility Relocation;
- Amended Exhibit A4 Transit Center;
- Amended Exhibit A5 Bus Storage Facility;
- Exhibit A8 Temporary Bridge
- Exhibit A9 Bus Ramps
- Exhibit A10 On-going Construction Coordination Support
- Exhibit A11 Signal Work

All applicable work shall be performed consistent with the SFMTA *Conceptual Engineering Report* (August 2012) attached hereto as Exhibit A12.

Amended Exhibits A3, A4, and A5, and Exhibits A8, A9, A10, A11, and A12 are attached to this Amendment Agreement and incorporated by reference as though fully set forth herein.

b. Appendix B, Exhibits B-1 and B-2.

Appendix B shall be replaced in its entirety with Exhibits B-1 and B-2 that are attached to this Second Amendment to the Agreement to reflect current SFMTA wage rates, and incorporated by reference as though fully set forth herein .

c. Section II. Contract Amount and Terms of Payment.

Subsection A shall be replaced in its entirety to read as follows:

A. Reimbursement for SFMTA Transbay Work Elements. Compensation under this agreement shall be on a cost reimbursement basis only. The TJPA agrees to reimburse the SFMTA for all actual, allowable, reasonable costs incurred for the SFMTA Transbay Work performed under this Agreement. The salary rates of SFMTA personnel, including overhead rates, are set forth in Exhibit B. These rates reflect actual salaries paid to SFMTA employees who will

be carrying out the work. Said rates are subject to change, depending on negotiated cost of living and other increases in applicable City collective bargaining agreements. Such changes shall not be subject to the prior approval of the TJPA; however, the SFMTA shall notify the TJPA in writing whenever hourly labor rates by classification are changed. Such notice shall be given prior to or along with the first invoice that reflects the changed hourly labor rates.

Subsection B shall be replaced in its entirety to read as follows:

B. Estimated Contract Amount. In no event shall the total compensation under this Agreement exceed \$5,393,677 without a written amendment to this Agreement. The parties agree to amend this Agreement to increase the Contract Amount if the actual approved costs for the work exceed the Estimated Contract Amount.

d. Section III. Term; Termination

Subsection A shall be replaced in its entirety to read as follows:

A. Term. This Agreement will commence on the Effective Date and terminate on December 31, 2017, unless extended by the parties or terminated earlier by the parties.

- 3. Legal Effect.** Except as expressly modified by this Second Amendment, all of the terms and conditions of the Agreement shall remain unchanged and in full force and effect.

IN WITNESS WHEREOF, the parties execute this Agreement in San Francisco as of the date first mentioned above.

<p>TRANSBAY JOINT POWERS AUTHORITY</p> <p>_____</p> <p>Maria Ayerdi-Kaplan Executive Director</p>	<p>CITY AND COUNTY OF SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY</p> <p>_____</p> <p>Edward D. Reiskin Director of Transportation</p>
<p>APPROVED AS TO FORM:</p> <p>By _____</p> <p>Deborah L. Miller TJPA Legal Counsel</p>	<p>APPROVED AS TO FORM:</p> <p>Dennis J. Herrera, City Attorney</p> <p>By _____</p> <p>John I. Kennedy Deputy City Attorney</p>
<p>TJPA Board of Directors</p> <p>Resolution No. _____</p> <p>Dated: _____</p> <p>Attest:</p> <p>_____</p> <p>Secretary, TJPA Board</p>	<p>SFMTA Board of Directors</p> <p>Resolution No. _____</p> <p>Dated: _____</p> <p>Attest:</p> <p>_____</p> <p>Secretary, SFMTA Board</p>

**AMENDED EXHIBIT A3
UTILITY RELOCATION
TRAFFIC PLANNING AND ENGINEERING SERVICES BY SFMTA**

A. Scope of SFMTA Project Management and Engineering Services:

- I. The TJPA is relocating utility lines on Mission, Fremont, Beale and First streets as part of the Transit Center Relocation of Utilities Project. The SFMTA shall provide traction power analysis and engineering services to support the Transit Center Relocation of Utilities Project.
- II. The scope of SFMTA's services is limited to the following:
 - Review the impact of TJPA's relocation of SFMTA facilities and make recommendations to the TJPA design team based on traction power analysis.
 - Perform traction power analyses to determine the need for new traction power infrastructure (conduits, ductbank, cable, manholes) and make recommendations to TJPA design team.

Budget: **\$55,000**

B. Scope of SFMTA Traffic Planning and Project Management Services:

- I. SFMTA shall provide traffic planning, traffic engineering and project management services to support the Transit Center Utility Relocation.
- II. The scope of work is limited to the following:
 - Participate in the collaborative planning and design efforts by TJPA and its consultants for the routing of vehicle, pedestrian and transit traffic during the relocation of utilities adjacent to the Transit Center.
 - Review final specifications and estimates for traffic routing during the relocation of utilities.
 - Attend regular meetings and work with various agencies to minimize the impacts to the public during the utility relocation.
 - Provide SFMTA street supervision for vehicle re-routes.
 - Provide for any needed relocation of SFMTA overhead contact system (OCS), including support for re-routes/bus substitution during any period of OCS shutdown.

Not to Exceed Budget: **\$95,500 (DPT)**
\$15,000 (MUNI)

C. Scope of SFMTA Muni DUCT BANK Project Management, Planning and Coordination, Engineering, Construction Management Support and Inspection Services:

- I. *The TJPA is constructing a duct bank on Mission Street between Anthony and Main streets (Duct Bank) to accommodate MUNI cables supplying power for the reconfigured OCS at the new Transit Center. SFMTA shall provide project management, planning and coordination, construction management support, and inspection services for the Duct Bank.*
- II. *The scope of SFMTA's services is limited to the following:*
- *Review TJPA's duct bank design and provide comments.*
 - *Provide as-built documents when available.*
 - *Coordinate and interface with project team members including TJPA, TJPA contractor through TJPA Construction Management Oversight (CMO) consultant, and SFMTA (including SFMTA Resident Engineer, Inspectors, MUNI Maintenance and Operations).*
 - *Assist TJPA in coordinating needed MUNI trolley coach re-routes/stop changes during construction.*
 - *Assist TJPA CMO-Resident Engineer in submitting contractor's clearance requests to SFMTA's Operation Central Control (OCC) and attending clearance meetings.*
 - *Call in and close out daily OCC clearances.*
 - *Provide inspection services (days, nights, and weekends) for the work.*
 - *Issuing daily inspector reports for the work.*
 - *When authorized, issue directives or other required actions (such as stop work orders) to ensure that contractor's work does not negatively impact SFMTA's operations or safety.*
 - *Attend progress, coordination, and traffic management meetings for the work.*
 - *Assist TJPA CMO-Resident Engineer in reviewing submittals and RFIs by providing comments and recommendations.*
 - *Assist TJPA CMO-Resident Engineer in reviewing work progress and contractor's submitted work plan.*

Not to Exceed Budget: \$70,000

AMENDED EXHIBIT A4
TRANSIT CENTER
TRAFFIC PLANNING AND ENGINEERING SERVICES BY SFMTA

A. Scope of SFMTA Project Management and Engineering Services:

- I. TJPA is constructing a new Transit Center at Mission Street between Fremont and Beale streets. The SFMTA shall provide project management and engineering design services for the overhead contact system (OCS) project related to the new Transit Center. (See enclosed preliminary sketch, alignments are subject to change.)

- II. The scope of SFMTA's services is limited to the following:
 - Provide construction plans, sequencing plans, specifications, and construction cost estimates, including new trolley pole foundations, trolley poles, wires, wood troughs support spans and bracket arms.
 - Reconfigure existing special OCS.
 - Provide design of existing streetlight transfer to new trolley poles where required; remove existing streetlight poles as needed.
 - Participate in coordination meetings with City agencies, TJPA and TJPA's design team.
 - Coordinate and obtain approval from SFMTA Operations and Maintenance on the bus plaza design.

- III. The scope of SFMTA's services is based upon the following assumptions:
 - a. Baseline survey, existing underground utility information and new Transbay Transit Center drawings to be provided to SFMTA.
 - b. The design and relocation of existing utilities not owned by the SFMTA shall be addressed and designed by other parties. OCS installation may require the relocation of such existing utilities.
 - c. Additional work triggered by the relocation of trolley poles (curb ramp reconstruction, traffic signal and mast arm relocation, and the relocation of traffic signs, etc.) shall be addressed and designed by others.
 - d. All associated civil design elements (e.g. passenger boarding islands) shall be designed and addressed by other parties.
 - e. All new poles shall be designed using standard poles with standard cobra type streetlights.
 - f. Sub-sidewalk basement special foundations, and eyebolts to buildings, if any, shall be addressed and designed by other parties.
 - g. *The Conceptual Engineering Report, which is the basis for the Overhead Contact System detailed design, which is attached as Exhibit A12.*

Not to Exceed Budget: \$480,000

B. Scope of SFMTA Traffic Engineering Services:

- I. SFMTA shall provide traffic planning and engineering services for the new Transit Center.
- II. The scope of SFMTA’s services is limited to the following:
 - Participate in the collaborative planning and design efforts by TJPA and its consultants for the routing of vehicle, pedestrian and transit traffic for the new Transit Center.
 - Provide review of conceptual traffic signal plans.
 - Review preliminary specifications and estimates of traffic routing for the new Transit Center.
 - Attend regular meetings and review traffic routing needs to accommodate the construction of the new Transit Center.

Final designs and services for new or modified signage, striping, and traffic signals are outside the scope of proposed SFMTA (MUNI & DPT) services and subject to a separate agreement between TJPA and SFMTA.

Not to Exceed Budget: \$90,500

C. Scope of SFMTA Traffic Engineering and Shop Services:

- I. *SFMTA shall provide traffic engineering services for the construction by TJPA of the Transit Center on blocks generally bounded by Minna, Natoma, Beale, and Second streets.*
- II. *The scope of SFMTA’s services is limited to the following:*
 - *Review revised Transbay Transit Center (TCC) design for traffic signal timing and pole locations proposed at the entry and exit of the Bus Plaza, crosswalk, and traffic lane striping.*
 - *Review proposed Beale Street sidewalk and roadway reconfiguration.*
 - *Provide type and location of regulatory traffic signs, curb allocations, etc.*
 - *Coordinate with SFMTA shops for installation of signs, pavement markings, traffic signals and parking meters; prepare work authorizations as required.*
 - *Prepare legislation as required.*

SFMTA Traffic Engineering \$280,800

SFMTA Shop Services \$100,000

Not to Exceed Budget: \$380,800

**AMENDED EXHIBIT A5
BUS STORAGE FACILITY
TRAFFIC PLANNING BY SFMTA**

A. Scope of SFMTA Traffic Engineering Services:

- I. SFMTA shall provide traffic planning and engineering services for the new Bus Storage Facility (BSF) located between Perry and Stillman streets and 2nd and 3rd streets.
- II. The scope of SFMTA's services is limited to the following:
 - Participate in the collaborative planning and design efforts by TJPA, City departments, and the consultants for the Bus Storage Facility.
 - Attend regular meetings and review the traffic routing and traffic circulation needs to accommodate the Bus Storage Facility.
 - Review final specifications and estimates for traffic engineering services to accommodate the Bus Storage Facility.

Not to Exceed Budget \$29,000

B. Scope of SFMTA Project Management, Planning and Coordination, Engineering, Construction Management Support, and Inspection Services:

- I. *The TJPA is constructing a Bus Storage Facility (BSF) on a block bounded by Second, Third, Stillman, and Perry Streets. The BSF will require the relocation of a combined OCS/streetlight pole and foundation, the relocation of an existing SFMTA bus shelter on Third Street, construction of a bulb-out at the southeast corner of Third and Stillman Streets, traffic lane restriping and other site work. The SFMTA shall provide planning and coordination support, engineering, construction management support, and inspection services for the construction of the BSF.*
- II. *The scope of SFMTA's services is limited to the following:*
 - *Provide construction plans, sequencing plans, specifications, and construction cost estimates for the OCS including new wires, support spans and bracket arms.*
 - *Relocate existing trolley poles to allow proper clearance for buses entering and exiting the proposed storage yard.*
 - *Provide demolition design of existing trolley poles where required.*
 - *Review site investigation/existing as-built documents.*
 - *Participate in coordination meetings with City agencies, TJPA, and TJPA's design team.*
 - *Provide as-needed services in conjunction with the bidding of the contract documents.*
 - *Coordinate and interface with project team members including TJPA, TJPA contractor through TJPA Construction Manager consultant (CM), and SFMTA (including SFMTA resident engineer, inspectors, Muni Maintenance and Operations).*

- *Assist TJPA in coordinating needed Muni trolley coach re-routes/stop changes during construction shutdowns.*
- *Assist TJPA CM-Resident Engineer in submitting contractor's clearance requests to SFMTA's Operation Central Control (OCC) and attending clearance meetings.*
- *Call in and close out daily OCC clearances.*
- *Provide inspection services (days, nights, and weekends) for the work.*
- *Issuing daily inspector reports for the work.*
- *Provide full-time monitoring whenever contractor performs work impacting SFMTA operations. When authorized, issue directives or other required actions (such as stop work orders) to ensure that contractor's work does not negatively impact SFMTA's operations or safety.*
- *Attend progress, coordination, and traffic management meetings for the work.*
- *Assist TJPA CM-Resident Engineer in reviewing submittals and RFIs by providing comments and recommendations.*
- *Assist TJPA CM-Resident Engineer in reviewing work progress and contractor's submitted work plan.*
- *Assist TJPA CM-Resident Engineer in processing progress payments by issuing recommendations for quantity measurement and completion.*
- *Assist TJPA CM-Resident Engineer in the management of change orders related to the work that affects SFMTA's operations.*
- *Assist TJPA CM-Resident Engineer in reviewing Contract Change Order Requests and changes related to the work.*

III. The scope of SFMTA's services is based upon the following assumptions:

- *Baseline survey, existing underground utility information, and BSF drawings will be provided to SFMTA.*
- *The design and relocation of existing utilities not owned by the SFMTA shall be addressed and designed by other parties. OCS installation may require the relocation of such existing utilities.*
- *Additional work triggered by the relocation of trolley poles (curb ramp reconstruction, traffic signal, mast arm, and traffic sign relocation, etc.) shall be addressed and designed by others.*
- *All associated civil design elements (e.g., passenger boarding islands) shall be designed and addressed by other parties.*
- *All new poles shall be designed using standard poles with standard cobra type streetlights.*
- *Sub-sidewalk basement special foundations, and eyebolts to buildings, if any, shall be addressed and designed by other parties.*

Not to Exceed Budget: \$130,000

C. Scope of SFMTA Traffic Engineering and Shop Services:

- I. *SFMTA shall provide traffic engineering and shop services for the construction of the BSF.*
- II. *The scope of SFMTA's Traffic Engineering and Shop services is limited to the following:*
- *Review and approve design of Stillman Street bulb-out at Third Street, traffic lane re-striping on Third Street and other related work.*
 - *Approve relocation of SFMTA bus shelter on Third Street.*
 - *Review of two driveways into the BSF at Third Street and at Stillman Street.*
 - *Review plans for link ramp construction.*
 - *Coordination with SFMTA shops for installation of signs, pavement markings and parking meters; prepare work authorizations as required.*
 - *Prepare legislation as required.*
 - *Attended weekly progress meetings with the TJPA.*

SFMTA Traffic Engineering \$60,000

SFMTA Shop Services \$50,000

Not to Exceed Budget: \$110,000

EXHIBIT A8
TEMPORARY BRIDGE
PROJECT MANAGEMENT, PLANNING AND COORDINATION, ENGINEERING,
CONSTRUCTION MANAGEMENT SUPPORT, INSPECTION, AND TRAFFIC
ENGINEERING SUPPORT BY SFMTA

A. Scope of SFMTA Project Management, Planning and Coordination, Engineering, Construction Management Support, and Inspection Services

- I. TJPA is constructing a Temporary Bridge on Beale Street mid-block between Mission and Howard streets. SFMTA shall provide project management, planning and coordination, engineering, and construction management support and inspection services for the overhead contact system (OCS) to support the Beale Street Temporary Bridge.
- II. The scope of SFMTA's services is limited to the following:
- Provide construction plans, sequencing plans, specifications, and construction cost estimates for the OCS including new wires, support spans and bracket arms.
 - Reconfigure existing OCS special work.
 - Add or replace existing trolley poles and foundations as required to support new or relocated OCS.
 - Provide demolition design of existing trolley poles where required.
 - Review site investigations/existing OCS as-built documents.
 - Participate in coordination meetings with City agencies, TJPA, and TJPA's design team.
 - Provide as-needed services in conjunction with the bidding of the OCS contract documents.
 - Coordinate and interface with project team members including TJPA, TJPA contractor through TJPA Construction Management Oversight consultant (CMO), and SFMTA (including SFMTA resident engineer, inspectors, Muni Maintenance and Operations).
 - Assist TJPA in coordinating needed Muni trolley coach re-routes/stop changes during OCS construction shutdowns.
 - Assist TJPA CMO-Resident Engineer in coordinating with Muni Street Operations to request vehicles to test the OCS.
 - Assist TJPA CMO-Resident Engineer in submitting contractor's clearance requests to SFMTA's Operation Central Control (OCC) and attending clearance meetings.
 - Call in and close out daily OCC clearances.
 - Provide inspection services (days, nights, and weekends) for the OCS work.
 - Issuing daily inspector reports for the OCS work.
 - Provide fulltime monitoring whenever OCS contractor performs work impacting SFMTA operations. When authorized, issue directives or other required actions (such as stop work orders) to ensure that contractor's work does not negatively impact SFMTA's operations or safety.
 - Attend progress, coordination, and traffic management meetings for the OCS

work.

- Assist TJPA CMO-Resident Engineer in reviewing OCS submittals and RFIs by providing comments and recommendations.
- Assist TJPA CMO-Resident Engineer in reviewing OCS work progress and contractor's submitted work plan.
- Assist TJPA CMO-Resident Engineer in processing progress payments by issuing recommendations for OCS quantity measurement and completion.
- Assist TJPA CMO-Resident Engineer in the management of change orders related to OCS work that affects SFMTA's operations.
- Assist TJPA CMO-Resident Engineer in reviewing Contract Change Order Requests and changes related to the OCS.

III. The scope of SFMTA's services is based upon the following assumptions:

- a. Baseline survey, existing underground utility information, and new Transit Center drawings will be provided to SFMTA.
- b. The design and relocation of existing utilities not owned by the SFMTA shall be addressed and designed by other parties. OCS installation may require the relocation of such existing utilities.
- c. Additional work triggered by the relocation of trolley poles (curb ramp reconstruction, traffic signal and mast arm relocation, and the relocation of traffic signs, etc.) shall be addressed and designed by others.
- d. All associated civil design elements (e.g., passenger boarding islands) shall be designed and addressed by other parties.
- e. All new poles shall be designed using standard poles with standard cobra type streetlights.
- f. Sub-sidewalk basement special foundations, foundations through new Transit Center decking, and eyebolts to buildings, if any, shall be addressed and designed by other parties.

Not to Exceed Budget: \$181,000

B. Scope of SFMTA Traffic Engineering Services:

I. TJPA is constructing Temporary Bridges on Beale Street mid-block between Mission and Howard streets, and Fremont Street mid-block between Mission and Howard streets. SFMTA shall provide traffic engineering services to support the installation and removal of the Temporary Bridges.

II. The scope of SFMTA's Traffic Engineering services is limited to the following:

- Review and recommend approval of contractor submittal for vehicular and pedestrian traffic configuration of temporary bridges, including safety features to be installed.
- Coordinate comments and approvals with other City agencies.
- Provide traffic engineering services, such as review of signal, striping and signage plans and prepare supporting legislation, as required.
- Coordinate signal testing and turn-ons with the SFMTA Signal Shop, prepare signal timing cards, and prepare work orders.

- Coordinate with SFMTA Sign Shop and SFMTA Paint Shop for their respective areas of work in the public right-of-way; prepare work authorizations as required.

Not to Exceed Budget: \$ 128,000

**EXHIBIT A9
BUS RAMPS
TRAFFIC ENGINEERING SERVICES BY SFMTA**

A. Scope of SFMTA Traffic Engineering and Shop Services

- I. TJPA is constructing elevated bus ramp structures that will span above the public right-of-way in seven streets: Natoma, Howard, Tehama, Clementina, Folsom, Harrison, and Second streets. The SFMTA shall provide traffic engineering and shop services for the Bus Ramps.
- II. The scope of SFMTA's services is limited to the following:
- Provide parameters to be required by SFMTA to permit work and ensure safety during construction of the elevated bus ramp structures over roadways and sidewalks in the public right-of-way.
 - Determine that the schedule and scope of other activity to be permitted by SFMTA Interdepartmental Staff Committee on Construction and Other Projects in affected streets is coordinated with the schedule for Bus Ramps construction.
 - Coordinate comments and approvals with other City agencies.
 - Review traffic control plans proposed by the contractor to ensure conformance with SFMTA parameters.
 - At direction of SFMTA SSD, SFMTA Sign Shop to install regulatory and warning traffic signs and perform under work under its jurisdiction.
 - At direction of SFMTA SSD, SFMTA Paint Shop to layout and paint traffic lane markings, and perform other work under its jurisdiction.
 - At direction of SFMTA SSD, SFMTA Signal Shop to test, adjust and interconnect signals; prepare traffic signal timing changes and perform other work under its jurisdiction.

SFMTA Traffic Engineering \$53,000

SFMTA Shop Services \$20,000

Not to Exceed Budget: \$73,000

EXHIBIT A10
**ON-GOING CONSTRUCTION COORDINATION SUPPORT,
PROJECT MANAGEMENT, PLANNING AND COORDINATION, TRAFFIC
ENGINEERING, AND SHOP SERVICES BY THE SFMTA**

A. Scope of SFMTA Services:

- I. The SFMTA shall provide planning support and project management support services for ongoing construction in the public right-of-way to support the construction and future operations of the Transbay Transit Center.
- II. The scope of SFMTA's services is limited to providing support and coordination for the following:
 - Provide general project management and planning support and coordination.
 - Review contractor requests for special traffic permits for on-street construction that will effect Muni operations.
 - Coordinate with Muni Operations for Muni re-route/OCS de-energizing/stop changes related to on-street utility work requested by TJPA contractors.
 - Advise TJPA contractors and CMO personnel on the acceptable parameters of on-street work that could affect Muni operations.
 - Review contractor proposals for on-street and sidewalk work that impacts pedestrian flow and safety.

Budget: \$300,000

B. Scope of SFMTA Traffic Engineering and Shop Services:

- I. SFMTA shall provide traffic engineering and shop services to support the ongoing construction and future operations of the Transbay Transit Center.
- II. The scope of SFMTA's Traffic Engineering and Shop services is limited to the following:
 - Attend weekly and special coordination meetings with CMO team, Transbay contractors, utility agencies/contractors and neighboring project representatives to assess work planned in the public right-of-way.
 - Provide guidance to contractors on traffic control plans and in advance of issuing Special Traffic Permits. Review submitted traffic control plans.
 - Coordinate SFMTA enforcement coverage for major events.
 - Undertake field investigations to ensure adequacy of detours, signage, etc. in order to provide for pedestrian and vehicular safety.
 - Provide input and guidance on operational issues related to the Temporary Terminal and major events in the area of TTC construction.
 - Direct the SFMTA Sign Shop to install regulatory traffic signs and perform other work under its jurisdiction.
 - Direct the SFMTA Signal Shop to test, adjust, and interconnect traffic signals; prepare traffic signal timing cards and perform other work under its jurisdiction.

- Direct the SFMTA Striping Shop to layout and paint traffic lane markings, and perform other work under its jurisdiction.
- Direct the SFMTA Meter Shop to install and remove parking meters and perform other work under its jurisdiction as requested or required.
- As directed by SFMTA SSD traffic engineers, SFMTA shops to perform work.

Not to Exceed Budget: \$ 440,200

EXHIBIT A11 SIGNAL WORK

Traffic Signals at Preceding Intersections

The TJPA is building a Bus Plaza within the Transit Center between Fremont and Beale Streets. The Transbay Transit Center project will install traffic signals at the entry and exit of the Bus Plaza on Beale and Fremont streets mid-block between Mission and Howard streets. The City recommends that the new traffic signals be interconnected with the existing traffic signals along these corridors in order to synchronize the new traffic signals with the existing traffic signal. Additionally, a signal on Second Street at Minna Street to allow south-bound vehicles to enter Minna Street for deliveries to the Transit Center and for drop-off/pick-up of inter-city bus passengers and others is under consideration and the TJPA may request that the SFMTA assist with this work.

I. Traffic Signals at Transbay Terminal Intersections

The Transbay Transit Center (TTC) project anticipates installing traffic signals at the following intersections:

- 1st Street and Minna Street
- 1st Street and Natoma Street
- 2nd Street and Minna Street
- Beale Street mid-block between Howard and Mission Streets
- Fremont Street and Natoma Street
- Mission Street and Shaw Alley

II. The scope of SFMTA's Traffic Engineering and Shop services is limited to the following:

- Provide City records regarding traffic counts and roadway striping.
- Review of traffic signal plans and specifications to ensure conformity with applicable City, state, and federal standards and constructability concerns.
- Review of traffic signal cost estimates.
- Attend design and field review meetings.
- Coordinate SFMTA Signal Shop support.
- Prepare legislation as needed.
- Prepare signal timing plans and program signal controllers.
- Coordinate and attend signal activation.
- Provide input for punch list activities.
- Support certification and testing of new traffic signals.

Not to Exceed Budget: \$ 300,000

EXHIBIT A12
CONCEPTUAL ENGINEERING REPORT

(Attached)

Transbay Transit Center Program

Overhead Contact System

At The Bus Plaza and Adjacent Streets



Rendering courtesy of TJPA

Conceptual Engineering Report

August 2012

PREPARED BY:

SFMTA CAPITAL PROGRAMS AND CONSTRUCTION DIVISION

**One South Van Ness Ave, 3rd Floor
San Francisco, CA 94103**

EXECUTIVE SUMMARY

This Conceptual Engineering Report (CER) documents the scope, cost and schedule for the Overhead Contact System (OCS) and Traction Power System (TPS) within the new Transbay Transit Center and adjacent streets that will be designed by the Capital Programs and Construction Division. It is a result of investigations, studies, evaluations, and collaborative discussions between the San Francisco Municipal Transportation Agency (SFMTA) and Transbay Joint Powers Authority (TJPA).

The goal of Capital Programs and Construction's involvement in this project is to design an OCS and associated Traction Power System to support Muni's trolley coaches serving the new Transbay Transit Center, as well as provide for future Muni's service as projected in the Transit Effective Project (TEP).

The scope of work includes the construction of trolley wires, overhead special work, trolley poles, and other associated OCS hardware at the new Transit Plaza and adjacent streets: Mission Street, Beale Street, First Street, Fremont Street, and Howard Street. The scope also includes the upgrade and re-configuration of the feeder system and traction power substation components.

The construction cost for the OCS and TPS is estimated at \$5 million and is funded by TJPA.

The Design Phase will commence upon the signing off of this report. Construction is estimated to take twelve months and is anticipated to be in parallel with the Transbay Transit Center building construction.

The sign-off of this report signifies the authorization to proceed with detail design for the scope as described herein. Any subsequent modification will be considered a scope change, which requires amendment to the CER and sign-off by Management.

TABLE OF CONTENTS

Executive Summary	I
Table of Contents	II
Project Map	V
I. OBJECTIVE AND BACKGROUND	
A. Objective	1
B. Background	2
1. The Transbay Transit Center	2
2. Temporary Transbay Terminal	3
3. Existing (Demolished) Transbay Terminal	3
C. SFMTA’s Roles	4
II. FUNCTIONAL AND OPERATIONAL CRITERIA	
A. Bus Plaza	4
B. Above Grade Bus Deck Level	5
C. Adjacent Streets.....	5
III. SCOPE OF WORK	
A. Overhead Contact System	7
B. Traction Power System.....	9
IV. ISSUES AND CONSTRAINTS	
A. Architectural Considerations.....	10
B. Protections of the New Transbay Transit Center.....	10
Bus Plaza Glass Awning	
C. Future Muni Trolley Service Expansion within the Bus Plaza	11
D. Maintenance of OCS within the Bus Plaza	11
V. CONSTRUCTION BUDGET ESTIMATE	12
VI. SCHEDULE	11
VII. ENVIRONMENTAL REVIEW	11

VIII.	QUALITY ASSURANCE / CONTROL	
A.	Design Phase	12
B.	Construction Phase.....	12
IX.	TESTING AND START-UP	
A.	Testing.....	13
B.	Start-Up	13
X.	APPENDICES	
A.	Design Criteria	
I.	Overhead Contact System (OCS)	14
A.	Hardware Criteria.....	14
B.	Trolley Wire Alignment.....	14
II.	Overhead Supports and Foundations	15
A.	Overhead Supports and Foundations	15
1.	Poles.....	15
2.	Pole Foundations.....	15
3.	Pole Replacement	15
4.	Pole Finish Treatment	15
5.	All OCS poles should be grounded	15
6.	Protection Devices	16
III.	Traction Power System	16
IV.	Design Codes and Guidelines	17
B.	Specification Outline.....	19
C.	Budgetary Cost Estimates	22
D.	Conceptual Engineering Drawings	25

LIST OF FIGURES

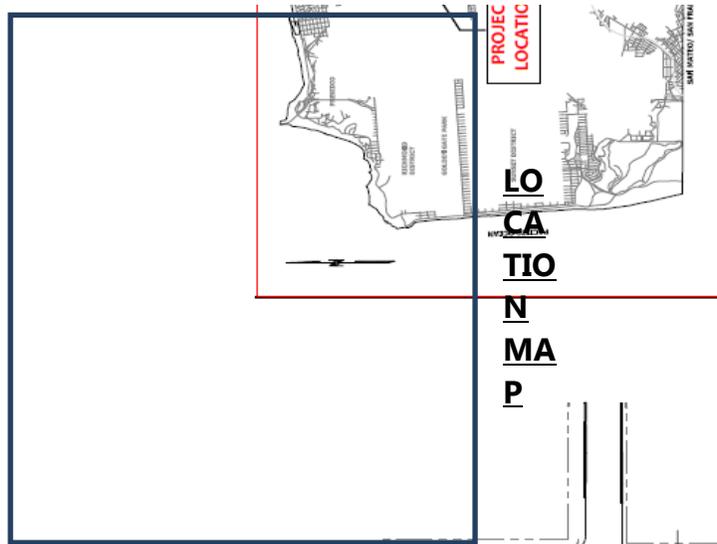
Figure 1: Cross-Section View of Transbay Transit Center1

Figure 2: Temporary Transbay Transit Center2

Figure 3: Muni Lane Allocations.....7

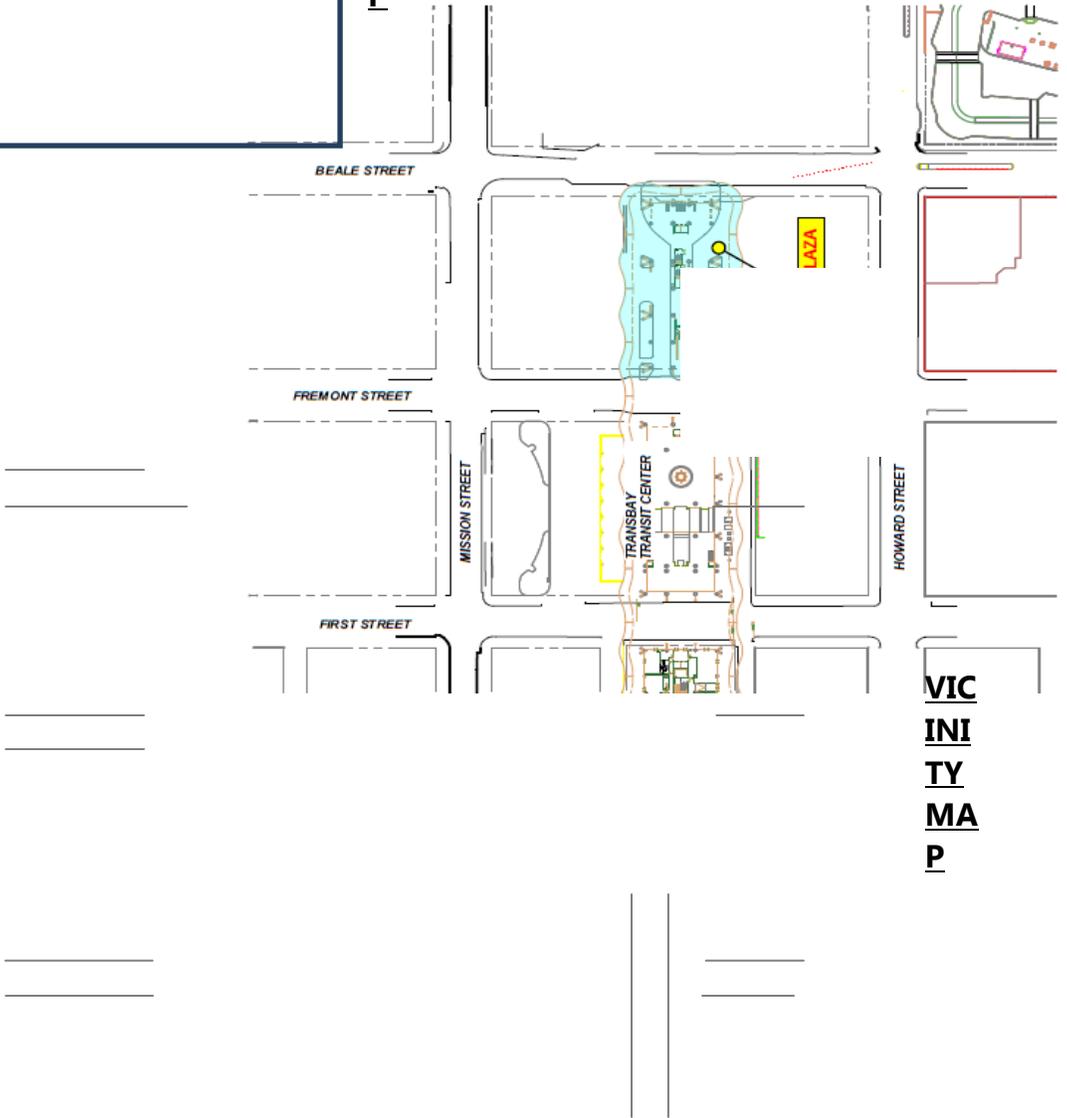
Figure 4: New OCS Work 10

Figure 5: Typical View of Awning Protection Bars 11



PROJECT
LOCATION

**LO
CA
TION
M
A
P**



**VIC
INI
TY
M
A
P**

I. OBJECTIVE AND BACKGROUND

A. OBJECTIVE

The primary purpose of this project is to design and construct an OCS and associated TPS to support Muni's trolley coaches serving the Transbay Transit Center. The work is performed in four phases:

1. Temporary Terminal
2. Existing Transbay Transit Terminal Demolition
3. Traction Power Study
4. New Transbay Transit Center

For each phase, SFMTA was tasked with the following work:

Task	Facility	Description	Status
1	Temporary Terminal	Provide planning, design and construction support services for the re-configuration of OCS to support Muni trolley bus operation at the Temporary Terminal.	Completed
2	Existing Transbay Transit Terminal Demolition	Provide planning, design and construction support services for the demolition of existing OCS at the existing terminal and provide design of temporary OCS.	Completed
3	Traction Power Study	Perform traction power analysis to evaluate the impact to Muni's traction power system caused by the relocation of the terminal from Mission/First/Fremont streets to Mission/Fremont/Beale streets. Provide recommendations for traction power upgrade. ¹	Completed
4	New Transbay Transit Center	Provide planning and design services for the final OCS configuration and Traction Power System within the bus plaza and the adjacent streets required by current and future Muni trolley coach operation.	Current task and scope for this report

¹ Feeder Circuit Analysis Report, Transbay Terminal Project, June 2008

As shown above, three of the four tasks have been completed. This report will focus on Task 4, the design and construction of OCS and Traction Power System for the new Transbay Transit Center.

B. BACKGROUND

The Transbay Transit Center Project, headed by the Transbay Joint Powers Authority (TJPA), is a transportation and housing project that will transform downtown San Francisco and the San Francisco Bay Area's regional transportation system by creating a "Grand Central Station of the West" in the heart of a new transit-friendly neighborhood. The first phase of the Transbay Transit Center project will create a new five-story Transit Center building and an interim bus terminal facility, the Temporary Transbay Terminal.

1. The Transbay Transit Center

The proposed Transbay Transit Center will replace the recently demolished old Transbay Terminal at First Street and Mission Street with a modern regional transit hub. This transit hub will connect eight Bay Area counties and the State of California through 11 transit systems: AC Transit, BART, Caltrain, Golden Gate Transit, Greyhound, MUNI, SamTrans, WestCAT Lynx, Amtrak, Paratransit and future High Speed Rail from San Francisco to Los Angeles/Anaheim.

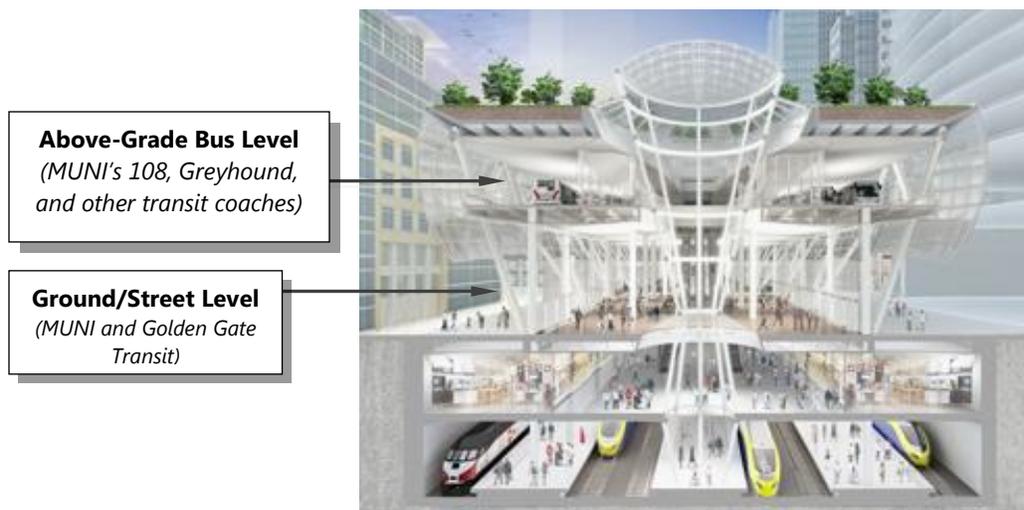


Figure 1: Cross Section View of Transbay Transit Center
Rendering courtesy of TJPA

It will create a new five-story Transit Center with a rooftop park, an above-grade bus level, a ground-floor, a concourse, and a

below-grade rail level which will serve Caltrain and future California High Speed Rail (See Figure 1). The ground floor or street level will serve as the primary circulation hub and includes a covered bus plaza located at the eastern end of the building between Fremont Street and Beale Street, serving MUNI, SamTrans, and Golden Gate Transit buses.

2. Temporary Transbay Terminal.

Since the proposed multi-mode Transbay Transit Center will occupy the same location as the recently demolished old Transbay Terminal, an interim bus terminal facility, the Temporary Transbay Terminal was constructed to provide continuous uninterrupted passenger service during this transition period. This terminal is located on the block bounded by Main Street, Folsom Street, Beale Street and Howard Street (See Figure 2). This temporary terminal was opened in late 2010 and is expected to be in use until the completion of the new Transbay Transit Center, scheduled for 2017.



Figure 2: Temporary Transbay Transit Center
Rendering courtesy of TJPA

3. Existing (Demolished) Transbay Terminal

The demolition of this terminal located at Mission Street between First Street and Fremont Street was completed in early 2011. This old terminal used to serve as a terminus for the 5-Fulton and the

discontinued 6-Parnassus trolley lines as well as the 38- Geary and 38L – Geary motor coach lines.

C. SFMTA's ROLES

The overall design and construction of the Transbay Transit Center infrastructure is being managed by the TJPA and performed by its various design consultants and contractors. As part of the TJPA and City Departmental efforts, SFMTA is participating in the collaborative planning and design in the project's infrastructure and street improvements. Per the intergovernmental agreements between the TJPA and SFMTA dated July 21, 2009² and July 19, 2007³, SFMTA will provide planning input, engineering services, and construction support services for the design and construction of MUNI's Overhead Contact System (OCS), Traction Power System, and traffic related work. The Capital Programs and Construction Division is involved in OCS and Traction Power System design and construction support. Whereas the Sustainable Streets Division is involved in planning, traffic routing, and traffic signal design.

II. FUNCTIONAL AND OPERATIONAL CRITERIA

The functional and operational criteria for the new Transbay Transit Center, including the bus plaza and the adjacent streets leading to the Transbay Transit Center, are as follows:

A. BUS PLAZA (See Figure 4)

The new Transbay Transit Center bus plaza will serve as a terminus for the following MUNI trolley coaches:

MUNI Line	Coach Type	Proposed Lane Allocation (See Figure 4)
5-Fulton 5-Fulton L (Express)	Trolley	3 and 4
38-Geary 38L-Geary (future BRT)	Motor	5, 6, and 7
71-Noriega. 71L-Noriega (Express)	Motor	8

² Contract CS-159, Agreement between the SFMTA and the Transbay Joint Powers Authority (TJPA)

³ Contract CS-150, Agreement between the SFMTA and the Transbay Joint Powers Authority (TJPA)

Lane 8 will also serve as a by-pass lane for trolley lines 5-Fulton and 5L-Fulton if Lanes 3 and 4 are blocked or unavailable for other reasons.

All coaches will enter the new bus plaza from Beale Street south of Mission Street, and will exit the terminal going north along Fremont Street, back towards Mission Street.

Lanes 1 and 2 are set aside for Golden Gate Transit service to the North Bay via San Francisco surface streets.

B. ABOVE GRADE BUS DECK LEVEL

MUNI Line 108-Treasure Island, serviced by motor coaches, will terminate on the bus deck level of the Transbay Transit Center, allowing it to connect directly to ramps leading to/from the Bay Bridge.

C. ADJACENT STREETS

1. MUNI Lines 38/38L-Geary, and 71/71L-Noriega will travel southbound on First Street from eastbound Market Street and then turn left eastbound onto Mission Street. They will continue eastbound on Mission Street then turn right onto Beale Street. From Beale Street, they will enter the bus plaza using the southern-most driveway.
2. MUNI Lines 5-Fulton and 5L-Fulton will have the same route as the 38/38L-Geary and 71/71L-Noriega; but, will travel eastbound on Mission Street using its own new trolley wires separate from those used by the 14-Mission trolley line. These coaches will enter the bus plaza using the northern-most driveway.
3. MUNI Line 14-Mission will have a new island stop on Mission Street adjacent to the Transbay Transit Center between First Street and Fremont Street.
4. For emergency and other non-revenue by-pass operation function, an OCS loop around the Transbay Transit Center bus plaza is provided to support trolley coach operation. This loop will go southbound on Beale Street from the bus plaza, right to westbound Howard Street, and right to northbound Fremont Street.

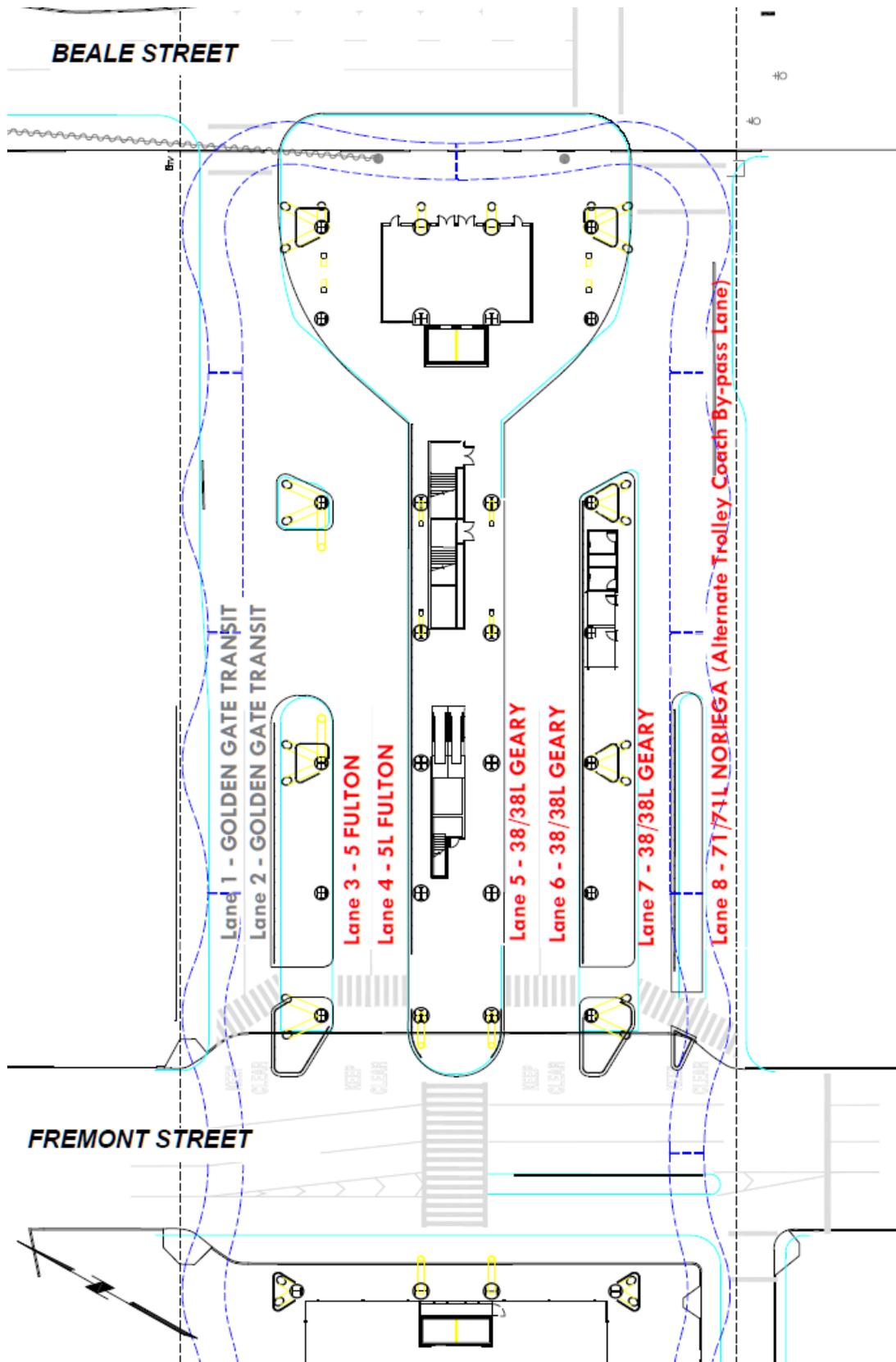


Figure 3: Muni Lane Allocations

III. SCOPE OF WORK

The scope of work is based on SFMTA's current and future functional and operational needs. The work includes (See Figure 4):

A. OVERHEAD CONTACT SYSTEM

1. Provide a new set of left turn trolley wires from southbound First Street to eastbound Mission Street.
2. Provide a new parallel set of eastbound trolley wires on Mission Street between First Street and Beale Street.
3. Add new OCS crossing from the new eastbound Mission Street trolley wires to the existing parallel eastbound Mission Street trolley wires. The OCS crossing will be located mid-block on Mission Street between Fremont Street and Beale Street.
4. Redesign and reconstruct the existing eastbound left turn OCS special work from Mission Street to Beale Street. The turning trolley wires will start from the new parallel set of eastbound trolley wires instead of from the existing eastbound Mission Street trolley wires use by the 14-Mission coaches.
5. Provide new OCS special work with advance inductive switches from Beale Street into the north and south entries of the bus plaza.
6. Provide new OCS special work within the bus plaza as following:
 - a. Lanes 3 & 4
 - (1) Trolley wires, universal spacer bars, curve segments and inductive switches attached directly to the ceiling under the lower ceiling of the bus plaza for both lanes.
 - (2) Insulated trolley trough or equivalent protection above the OCS to comply with CPUC GO95 requirements⁴. Insulated trolley trough design will be by others.

⁴ State of California, General Order No.95, Rule 74.4E

- b. Lane 8: Trolley wires and supporting bracket arms attached to trolley poles
- 7. Provide new OCS special work with trailing switches from the north and south exits of the bus plaza to northbound Fremont Street.
- 8. Redesign and reconstruction the existing right turn OCS special work from Beale Street to Howard Street.
- 9. Provide a new right turn OCS special work from Howard Street to Fremont Street.
- 10. Provide nine new poles and replace 14 undersized overhead poles to support the new OCS.
- 11. Review and coordinate OCS work with Transbay Transit Center Building System and Finishes.

B. TRACTION POWER SYSTEM

- 1. Provide four new positive and four new negative feeder cables along Mission Street between Anthony Street and Beale Street.
- 2. Provide new positive and negative feeder riser cables & conduits to feed the OCS.
- 3. Upgrade existing DC feeder breakers to increase breaker capacity to handle additional loading.
- 4. Provide new sectionalizing switch to enable de-energizing of the OCS at the Transbay Transit Center bus plaza for maintenance.
- 5. Replace existing feeder risers when poles are replaced.

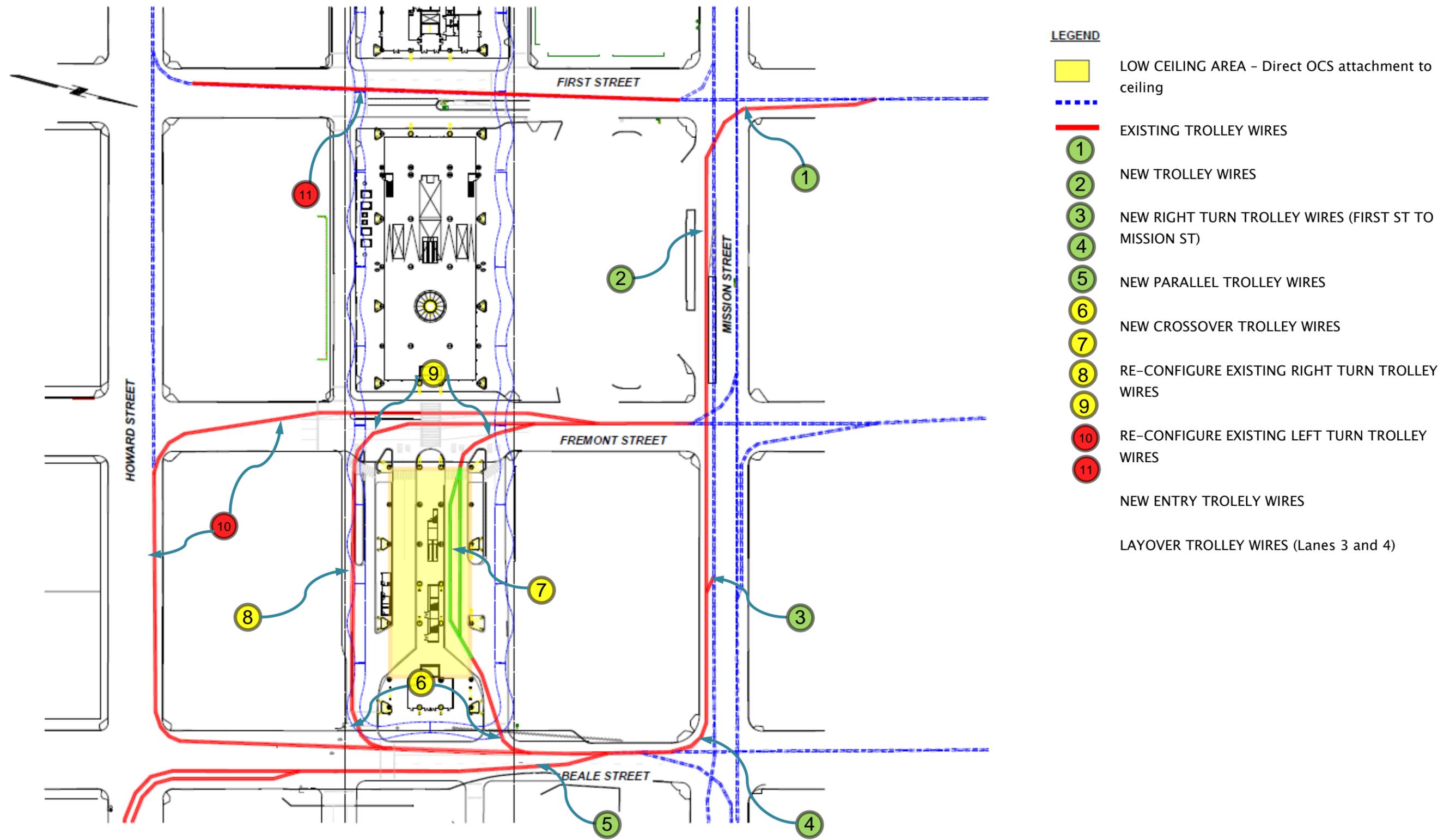


Figure 4: New OCS Work

IV. ISSUES AND CONSTRAINTS

A. ARCHITECTURE CONSIDERATIONS

In an effort to blend in the OCS support elements within the bus plaza, the architects, in working with its building structural engineers, will provide architecturally designed structural OCS supports at selected building columns to allow OCS span wire attachments. These will be in lieu of typical eyebolts used for building columns.

Within the building's center low ceiling area, vertical fixed supports will be used to support the OCS rather than guy wires.

In addition, trolley poles will be combined with streetlight and traffic signals to reduce the number of poles where possible. Span wires, guy wires, and other hardware will be configured to reduce visual impact where feasible.

B. PROTECTION OF THE NEW TRANSBAY TRANSIT CENTER BUS PLAZA GLASS AWNING

One of the major concerns of running trolley coaches into the bus plaza area is the possibility of bus collector pole hitting the glass awning above if the collector pole de-wire. Muni's trolley coaches (ETI and Flyer) have a trolley collector pole retriever system that is set to automatically lower the collector pole during a de-wirement event.

However, there are still concerns of an unintended contact

between the bus collector pole and the

glass awning above during a de-wirement event where the trolley pole retriever system malfunctions. Although the glass panels are designed to withstand substantial impact load, the consensus is to protect the glass panels at strategic locations where they are more vulnerable to be hit by errant de-wired trolley collector poles. TJPA building design team has incorporated into their glass awning design a protection system consisting of protruding insulated stainless steel bars from the glass panels to protect against errant trolley bus pole hitting the glass awning. (See Figure 5)



Figure 5: Typical View of Awning Protection Bars
(Shown in orange color)
Rendering courtesy of TJPA

C. FUTURE MUNI TROLLEY SERVICE EXPANSION WITHIN THE BUS PLAZA

As previously mentioned, lanes 3, 4 and 8 will have a complete OCS for Muni's trolley buses. To accommodate the potential expansion of Muni trolley bus service at Lanes 5 and 6 in the future, a structural support system, similar to those that are supporting the OCS at, will be planned at the ceiling above Lanes 5 and 6 (See Figure 4). This feature will allow installation of an OCS in Lanes 5 and 6 without having to make major modification to the bus plaza ceiling.

D. MAINTENANCE OF OCS WITHIN THE BUS PLAZA

The Transbay Transit Center, including the bus plaza, is under the jurisdiction of TJPA. TJPA intends to negotiate, as part of a Use and Lease Agreement (ULA) with SFMTA, an OCS maintenance agreement to maintain the OCS and TPS. Maintenance of the OCS and TPS requires specialized overhead line crews and equipment that is only available at Muni. The ULA will include the OCS within the bus plaza and at other areas of the Transbay Transit Center, such as the building bridge over First Street and Fremont Street. The ULA will include emergency repair and preventative maintenance. It will also cover requests by TJPA's to de-energization the OCS to accommodate its routine building maintenance activities, such as re-lamping, inspection and testing of fire sprinklers etc. that require the use trucks and lifts that encroach into the OCS energized zone.

V. CONSTRUCTION COST ESTIMATE

The costs of engineering and construction support services provided by the SFMTA are reimbursable by TJPA under the intergovernmental agreements. The construction of the OCS and related work at the New Transbay Transit Center and the adjacent streets will be funded and managed by TJPA. The estimated construction cost for the OCS and TPS, including contingency, is \$5 million. (See appendix C for cost breakdown).

VI. SCHEDULE

The OCS for the bus plaza and adjacent streets is planned for operation in 2017.

VII. ENVIRONMENTAL REVIEW

The Environmental Impact Report (FEIS/EIR) for the new Transbay Transit Center (SCH95063004) was approved by the City and County of San Francisco in April 2004. The report includes references to the modification of the OCS as generally described in this CER on streets or portions of streets that currently have functional

OCS, which include Mission Street from First to Beale streets, Beale Street from Mission to Howard Street, First Street from Mission to Howard streets, as well as Fremont Street from Minna to Mission streets. In other words, modifications to these retained segments have been environmentally approved.

A totally new section of Overhead wires, about 350 feet on Fremont Street from Howard Street to Minna Street (the exit from the bus plaza) will require an amendment to the Transit Center FEIR/EIS for environmental clearance. This amendment will be pursued by TJPA and very likely be granted prior to construction of the new OCS for this section of Fremont Street.

VIII. QUALITY ASSURANCE / CONTROL

The overall program quality control and quality assurance plan is implemented at both the design and construction phase.

A. DESIGN PHASE

During the design phase, the quality control/quality assurance (QA/QC) plan for this project consists of two components, the project team's quality control plan, and SFMTA Capital Programs and Construction Division's quality assurance oversight.

1. Project Team Quality Control Plan – Design Phase

Quality Control for the design phase consists of the process of preparing construction documents, which include the plans, specifications and expected cost estimate that accomplish the following criteria:

- a. Meet the needs of the end user
- b. Meet applicable code and design requirements
- c. Plans and specifications are biddable
- d. Plans and specifications are constructible

2. To meet the aforementioned requirements, the design will proceed in accordance to the guidelines set forth in SFMTA Capital Programs and Construction Division's Project Operations Manual. In addition to the internal project team controls set forth for a project, the contract documents will be distributed to the various stakeholders and governing jurisdictions for review and comments.

B. CONSTRUCTION PHASE

As this project will be part of a TJPA bid and construction package, the QA/QC will be implemented by the TJPA's and its Construction Management/General Contractor's (CM/CG) QA/QC Procedures in accordance with TJPA Quality Management System (QMS).

IX. TESTING AND STARTUP

A. TESTING.

Before accepting the constructed work, the Muni Overhead Line Department, in conjunction with Capital Programs and Construction, and TJPA's CMGC personnel will assist the Resident Engineer in inspecting the completed work and identifying any deficiencies. In addition, test runs through the entire limits of the project will be made by trolley coaches at speeds directed by the Engineer to identify any operational deficiencies. The contractor is required to correct all deficiencies identified to the satisfaction of the Engineer before acceptance of the system.

B. START-UP

A startup plan will be coordinated and developed during the detailed design and construction phases of the project. It will involve coordination with Operations, Safety, Scheduling, and other stakeholders and include public outreach, operator training, bus stop relocations and other activities.

APPENDIX A – DESIGN CRITERIA

I. Overhead Contact System (OCS)

Overhead hardware should be products of manufacturers regularly engaged in the production of such material and equipment, and is of the manufacturer's latest design approved by Muni. This is to ensure compatibility and interchangeability with the current Muni overhead hardware and spare parts. The followings are specific hardware characteristics for the project:

A. Hardware Criteria

1. Overhead Contact System shall be a rigid type system similar to Ohio Brass (OB) / Westinghouse Air Brake Company (WABCO) / Impulse NC, Inc. / Phoenix Mining Company.
2. Trolley wire shall be bronze, grooved, alloy 80 conforming to ASTM B9-90. The following characteristics will be used:

Description	Muni Standards
Trolley Wire Size	#4/O or #2/O
#2/O Wire Tension @ 15.6°C	2000 lbs. per wire
#4/O Wire Tension @ 15.6°C	3000 lbs. per wire
Trolley Wire Height	19 ft. 6 in. ± 3 in. 18 ft. 6 in. ± 3 in. where appropriate
Trolley Wire Spacing	2 ft.
Axis of Trolley Wire pair from curb unless otherwise noted	14 ft. or 16 ft. per Muni Guideline
Maximum Unsupported Wire Span	100 ft

3. Replace overhead components and trolley wires that have a service life of less than 50%.
 4. Leading Switch shall be 15° Induction Controlled unless otherwise noted.
- B. Trolley Wire Alignment shall be in accordance with guidelines and criteria established by Municipal Railway High Performance Trolley Coach Overhead Minimum Standards.

II. Overhead Supports and Foundations

A. Overhead Supports and Foundations

1. Poles

- a. Steel poles will be in accordance with Muni Standard Drawing CL-7971, Rev. 2. For all standard applications, Pole Types 761N, 765N, 767 and 770 shall be used unless otherwise noted.
- b. New poles will be in line with property line between adjacent properties and avoid fronting doors, windows, and access ways wherever possible. Where an existing pole is replaced with a new pole, the new pole will be at approximately 4 feet away from the present location. At intersections, the poles should be as clear of the corner as possible to avoid being hit by right turning trucks. Wherever practical, locate poles away from bus zones.
- c. Wherever possible, poles will be combined with streetlight and traffic signals to reduce the number of poles. Poles with feeder risers inside will not be combined with traffic signals.

2. Pole Foundations

- a. Existing foundations will be removed to a depth of 3 feet below the finished grade. Where a pole has to be replaced in place due to space constraint, the existing foundation will be removed entirely and new foundation installed in place.
- b. New standard pole foundations will be in accordance with MUNI Standard Drawing CL-7971, Rev. 2. Where special foundations are required, they will be designed according to the current codes and regulations.

3. Pole Replacement

Replace City-owned wood poles, concrete poles, and steel poles that are bending, leaning, deeply pitted, or with rust and/or holes along the shaft or base.

4. Pole Finish Treatment

New steel pole shall have a galvanized finish (not painted) unless otherwise required by urban design requirements or streetscape master plan. Existing steel trolley pole shall be painted to match galvanizing or existing coating color.

5. All OCS poles should be grounded.
6. Protection Devices
 - a. Wood troughs, preformed glass / epoxy shields, or approved apparatus of a custom design if necessary, will be used wherever the overhead support structure shall be protected against possible arcing conditions.
 - b. Guy wire span supports shall include tree guard or similar item to protect against trolley shoe snags during de-wirement from a trolley vehicle.

III. Traction Power System

- A. Traction power cable for both feeder and riser cable shall be rated 2000 Volts, 90 degree C dry/wet. Cable shall have single, copper conductor with class B stranding per ASTM B8. Cable shall be unshielded, with EPR insulation and Hypalon jacket. Cable shall meet the requirements of NEMA WC-8 and UL-44.
- B. Multi-tap splice connectors shall be submersible rated for direct burial or below grade boxes, and shall be sized to connect conductors through 1000 kcmil with two-hole NEMA compression lugs. The connectors shall meet the performance requirements of ANSI C119.1, ANSI C119.4, and the Western Underground Committee Guide 2.5. The connectors shall be fabricated of the following material:
 1. Body – Tin plated copper
 2. Hardware – Stainless Steel
 3. Insulation – EPDM Rubber

IV. Design Codes and Guidelines

- A. Design of the overhead system, electrical system, and civil work will be based on the latest applicable provisions of the following codes, standards and regulations. Where more than one code, standard, or criterion is applicable, the most restrictive shall govern, except as indicated in this document.

- B. The codes, standards, and regulations include, but not limited to, the following:
1. California Public Utilities Commission (CPUC)
 - a. [General Order No. 95, Rules for Overhead Line Construction.](#)
 - b. [General Order No. 128, Rules for Construction of Underground Electric Supply and Communications Systems.](#)
 2. MUNI High Performance Trolley Coach Overhead Wire Minimum Standards.
 - a. Design standards and criteria developed on previous Muni projects.
 - b. City of San Francisco Standard Plans and Specifications.
 - c. [Code of Federal Regulations \(CFR\),](#)
 - (1) Title 29, Part 1910, Occupational Safety and Health Standards.
 - (2) Title 49, Parts 27, 37, and 38, American with Disabilities Act (ADA).
 - d. California Occupational Safety and Health Administration (CAL/OSHA).
 - e. Occupational Safety and Health Act of 1970 (OSHA).
 - f. California Code of Regulation (CCR)
 - (1) [Title 8; Industrial Relation, Subchapter 4, Construction Safety Orders.](#)
 - (2) [Title 8; Industrial Relation, Subchapter 5, Electrical Safety Orders.](#)
 - g. American National Standards Institute (ANSI) C2, National Electric Safety Code.
 - h. American Public Transit Association (APTA) – Rapid Transit Standards.

- i. National Electric Code (NEC).
- j. Illuminating Engineering Society (IES) Lighting Ordinances.
- k. Insulated Power Cable Engineer's Association (IPCEA).
- l. Telecommunications Industry Association (TIA).
- m. Underwriters Laboratories (UL).
- n. National Electrical Manufacturers Association (NEMA).
- o. San Francisco County Ordinance Code.
- p. [San Francisco Municipal Codes.](#)
- q. Uniform Building Code (UBC).
- r. Uniform Fire Code (UFC).

APPENDIX B – SPECIFICATION OUTLINE

DIVISION 1 - GENERAL REQUIREMENTS

(This section provided by TJPA as part of the overall contract)

01110	SUMMARY OF WORK
01210	ALLOWANCES
01220	PAYMENT
01310	COORDINATION
01312	PROJECT MEETINGS
01315	FIELD SUPERINTENDENT
01317	FIELD ENGINEERING
01320	PROJECT PLANNING, SCHEDULING AND CONTROL
01330	SUBMITTALS
01354	HEALTH AND SAFETY CRITERIA
01410	REGULATORY REQUIREMENTS
01420	REFERENCES
01450	QUALITY CONTROL
01500	CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
01510	TEMPORARY UTILITIES
01520	TEMPORARY CONSTRUCTION
01570	TRAFFIC REGULATION
01580	IDENTIFICATION SYSTEMS AND SIGNS
01590	CITY FACILITIES
01600	MATERIALS AND EQUIPMENT
01630	PRODUCT OPTIONS AND SUBSTITUTIONS
01720	PROTECTION OF PROPERTY
01750	START-UP AND TESTING
01770	CONTRACT CLOSEOUT
01782	CONTRACT RECORD DOCUMENTS
01784	OPERATION AND MAINTENANCE MANUALS

DIVISION 2 – SITE CONSTRUCTION

02050	DEMOLITION
02200	EARTHWORK

DIVISION 3 – CONCRETE

03300	CAST-IN-PLACE CONCRETE
-------	------------------------

DIVISION 4 – MASONRY - NOT USED

DIVISION 5 - METALS

- 05080 FACTORY-APPLIED METAL COATINGS
- 05510 TAPERED STEEL TROLLEY POLES AND ACCESSORIES

DIVISION 6 THRU 8 - NOT USED

DIVISION 9 - FINISHES

- 09910 PAINTING TROLLEY POLES AND SIGNALS

DIVISION 10 THRU 15 - NOT USED

DIVISION 16 - ELECTRICAL & OVERHEAD WORK

- 16050 BASIC ELECTRICAL MATERIALS AND METHODS
- 16110 RACEWAYS
- 16120 WIRE AND CABLE
- 16125 TRACTION POWER CABLE
- 16130 JUNCTION AND PULL BOXES
- 16450 GROUNDING
- 16610 BASIC OVERHEAD MATERIALS AND METHODS
- 16620 OVERHEAD CONTACT SYSTEM - SPECIAL WORK
- 16630 OVERHEAD CONTACT SYSTEM – TESTING AND ACCEPTANCE

APPENDIX C – BUDEGATARY COST ESTIMATE

Overhead Contact System Estimate Cost

Description		Unit	Comments	Total	Unit Price	Amount
OV-01	Special Work: First St and Mission St	LS	See Unit Price Sheet	1	\$184,000	\$184,000
OV-02	Special Work: Fremont St and Mission St	LS	See Unit Price Sheet	1	\$221,600	\$221,600
OV-03	Special Work: Beale St and Mission St	LS	See Unit Price Sheet	1	\$91,700	\$91,700
OV-04	Special Work: Beale St btw Mission St and Bus Plaza	LS	See Unit Price Sheet	1	\$229,600	\$229,600
OV-05	Special Work: Beale St btw Bus Plaza and Howard St	LS	See Unit Price Sheet	1	\$193,400	\$193,400
OV-06	Special Work: Howard St btw Fremont St and Beale St	LS	See Unit Price Sheet	1	\$209,000	\$209,000
OV-07	Special Work: Fremont St btw Howard St and Bus Plaza	LS	See Unit Price Sheet	1	\$71,400	\$71,400
OV-08	Special Work: Fremont St btw Bus Plaza and Mission St	LS	See Unit Price Sheet	1	\$163,600	\$163,600
OV-09	Provide 4/0 Trolleywire	LF	See Unit Price Sheet	8700	\$30	\$261,000
OV-10	Provide Universal Spacer Bar	LF	See Unit Price Sheet	650	\$50	\$32,500
OV-11	Provide Single Trolley Tangent Span	EA	See Unit Price Sheet	4	\$5,300	\$21,200
OV-12	Provide Tangent Span	EA	See Unit Price Sheet	0	\$5,600	\$0
OV-13	Provide Inverted Span	EA	See Unit Price Sheet	0	\$8,100	\$0
OV-14	Provide Feed Span	EA	See Unit Price Sheet	0	\$8,700	\$0
OV-15	Provide Equalizer Span	EA	See Unit Price Sheet	0	\$8,300	\$0
OV-16	Provide Auxillary Equalizer Span	EA	See Unit Price Sheet	0	\$6,400	\$0
OV-17	Provide Bracket Arm and Span	EA	See Unit Price Sheet	0	\$7,800	\$0
OV-18	Provide Steel Pole Type 770	EA	See Unit Price Sheet	36	\$18,100	\$651,600
OV-19	Provide Pole Foundation for 770 (183 kip-ft)	EA	See Unit Price Sheet	24	\$7,500	\$180,000
OV-20	Provide Special Foundation	EA	See Unit Price Sheet	8	\$10,000	\$80,000
OV-21	Prospect Hole for Depth up to 3 ft	EA	Contract 1242 - 5 Fulton Ductbank Construction Project - BI-OV12 average \$1400 (2010)	7	\$1,600	\$11,520
OV-22	Prospect Hole for Depth Greater than 3 ft	EA	Contract 1242 - 5 Fulton Ductbank Construction Project - BI-OV13 average \$2200 (2010)	4	\$2,500	\$10,000

Description		Unit	Comments	Total	Unit Price	Amount
OV-23	Remove Existing Trolley/Streetlight Pole and Foundation 3 ft below grade	EA	See Unit Price Sheet	13	\$3,100	\$40,300
OV-24	Remove Existing Trolley/Streetlight Pole and Foundation Entirely	EA	See Unit Price Sheet	1	\$6,100	\$6,100
OV-25	Paint Anti-Graffiti Coating on existing steel trolley pole	EA	Contract 1242 - 5 Fulton Ductbank Construction Project - BI-OV15 average \$1200 (2010)	0	\$1,400	\$0
OV-26	OCS Spare Parts	LS	See Unit Price Sheet	1	\$265,852	\$265,852
Engineer's Estimate:						\$2,924,372
30% Contingency						\$877,312
Say:						\$3,810,000 (2013 Dollar)

Assumptions:

1. Decorative fixture cost not included.
2. Trolley pole grounding cost not included.
3. Traffic Routing cost not included.
4. Special Pole Foundation cost not included.
5. Unit Price escalated to mid-construction (2013)

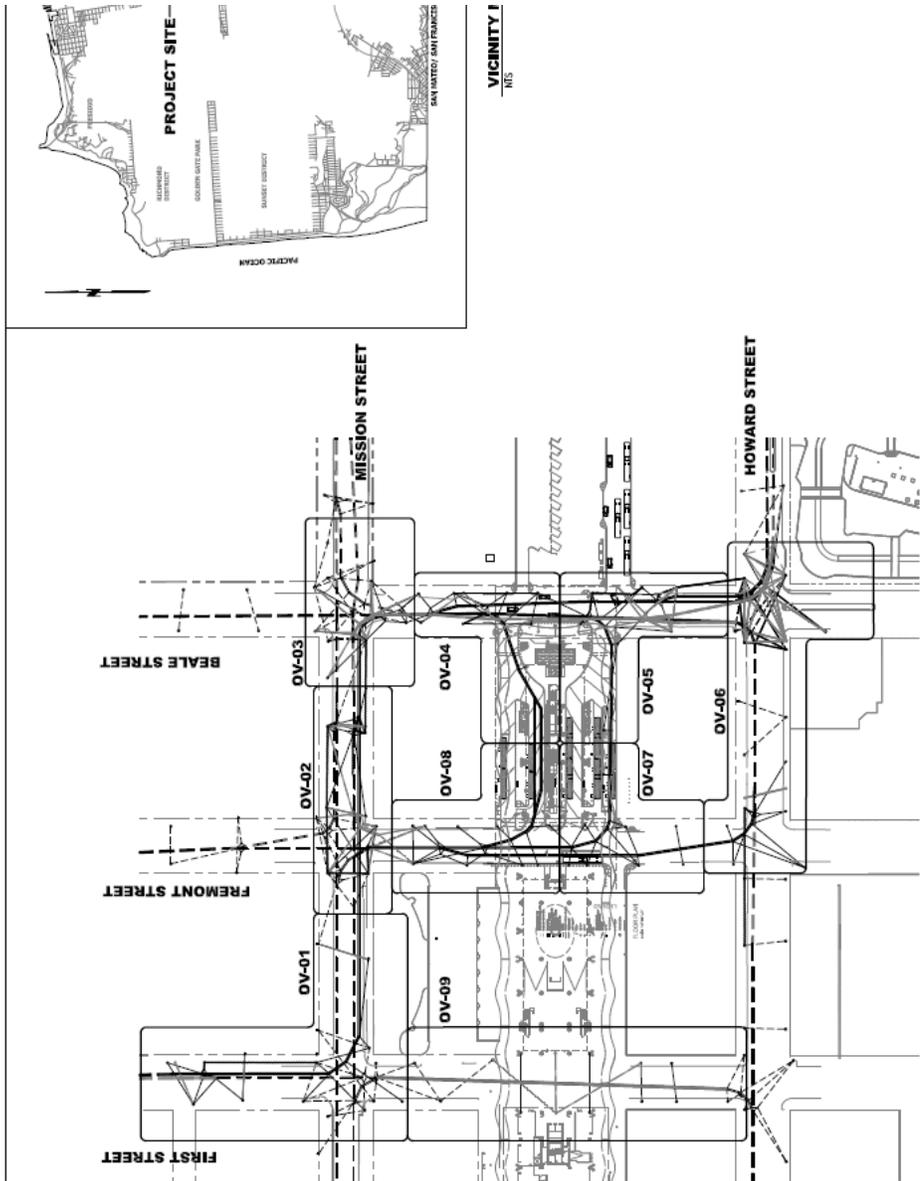
Traction Power System Estimate Cost

Description		Unit	Total	Unit Price	Amount
TP-01	750 kcmil Traction Power Feeder Cable	LF	15400	\$35	\$539,000
TP-02	500 kcmil Traction Power Riser Cable	LF	1850	\$30	\$55,500
TP-03	2" Galvanized Rigid Steel Conduit	LF	1700	\$100	\$170,000
TP-04	4000A DC Feeder Breakers	EA	2	\$60,000	\$120,000
Engineer's Estimate:					\$884,500
30% Contingency					\$265,350
Say:					\$1,150,000 (2013 Dollar)

Assumptions:

1. Ductbank by others
2. Traffic Routing cost not included.

APPENDIX D – CONCEPTUAL ENGINEERING DRAWINGS



LOCATION / KEY MAP
NIS

DATE:	
BY:	
CHKD:	
DESIGN:	
REVISIONS:	


CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
APPROVED

TROLLEY COACH S
TRANSBAY TRANSIT CENT
NEW TRANSIT CE
OVERHEAD CONTACT

NOTES

T BOLTS INDICATED ARE FOR ALIGNMENT PURPOSES ONLY. THE MINIMUM TENSION SHALL BE 100 LBS.
 * AND ABOVE TROLLEYWIRE SHALL BE PROVIDED WITH "TREE GUARD" SECURED WITH THE W/AF PER DETAIL 4. SEE STD DWG 10 END STRAPWIRE DETAIL B. SHALL ONLY BE USED WHERE THERE IS INSUFFICIENT INSTALLATION SPACE FOR A PREFORM. SHALL NOT BE CUT IN ORDER TO FIT INTO SMALLER SPACE
 E IS 12" OR LESS ABOVE TROLLEYWIRE. AN ADJUSTABLE HEIGHT TROLLEY CLAMP WITH INSULATOR, DET 76, SHALL BE DETAIL 4. SEE STD DWG 10-1294K.

WRES TO PROVIDE SUFFICIENT TAIL AT ANY JUNCTION FOR FINAL ADJUSTMENT. THE CONTRACTOR SHALL CUT THIS TAIL TO A PERFORMING THE FINAL ADJUSTMENT OF THE OVERHEAD CONTACT SYSTEM.

W/AF IS REQUIRED AT CROWNED, PORCELAIN INSULATOR, DET 94, SHALL BE USED, UNLESS OTHERWISE NOTED.

S AND POLE BAND HEIGHTS INDICATED ON THE DRAWINGS SHALL BE USED AS A GUIDE ONLY. THE CONTRACTOR SHALL WIRE TENSIONS AND POLE BAND HEIGHTS TO ACHIEVE THE REQUIRED TROLLEYWIRE TENSION, HEIGHT, AND ALIGNMENT.

S AND CROWNS SHALL BE ADJUSTED TO THE DESIGN TENSION SPANS ON THE SPANWIRE FOR INSTALLATION AT 60 °F.
 S END TENSIONS SHALL BE ADJUSTED IN THE FIELD TO ACHIEVE THE INDICATED TROLLEYWIRE TENSIONS.

S SHALL BE INSTALLED AT A HEIGHT OF 19.5' ± 3" ABOVE STREET FAVENENT AT SUPPORT POINTS, UNLESS

TROLLEYWIRE SHALL BE TENSIONED TO 3000 LBS PER WIRE, UNLESS OTHERWISE NOTED.

TROLLEYWIRE SHALL BE TENSIONED TO 2000 LBS PER WIRE, UNLESS OTHERWISE NOTED.

SEE THE Z SEPARATION BETWEEN TROLLEYWIRE CANNOT BE MAINTAINED. A STRONGER STEEL SHALL BE INSTALLED PER STD DWG 10-1294K.

HT OF EXISTING TROLLEYWIRE/SPECIAL WORK TO 19.5' ± 3" WHERE EXISTING PULLOFFS/SPANS ARE REPLACED BY PANS.

NO WORK THE CONTRACTOR SHALL MAINTAIN THE TENSION OF ALL EXISTING TROLLEYWIRE TO BE CHANGED TO NEW TO BE ATTACHED TO NEW SPECIAL WORK IF THE TENSION OF EXISTING TROLLEYWIRE IS LESS OR MORE THAN THE NEW CONTRACTOR SHALL PROVIDE APPROPRIATE DIFFERENTIAL TENSION DETAIL 50. SEE STD DWG 10-1294K. PLANS FOR THE INSTALLATION OF DIFFERENTIAL TENSION DETAIL 50 SHALL BE SUBMITTED TO THE

1. STEEL PILES SHALL BE BORED BEFORE INSTALLING TENSION. THE AMOUNT OF SPARE SHALL BE SET OPPOSITE TO THE IN OR IN THE DIRECTION OF ARROW AS SHOWN ON THE DRAWINGS.

DET 94 SHALL BE PROVIDED FOR ALL NEW AND REPLACED BULLHEADS. TANGENT SPANS, INVERTED SPANS, BRAN SPANS, TEE SPANS, DIFFERENTIAL TENSION DETAIL 50 ASSEMBLIES.

SHALL PROVIDE APPROPRIATE JIKS, DETAIL 74 TO 30, AND SPULERS, DETAIL 31, 31, 31, TO CONNECT TROLLEYWIRE TO BARRAGES AND FOR SPULING TROLLEYWIRE.

SHALL USE THE PILES FROM THE SPECIFIC MANUFACTURER FOR TOW LISTED ON THE OVERHEAD MATERIAL LIST TO 1 30 PILES. SEE STD DWG 10-1294K, 10-1294L, 10-1294M, 10-1294N, AND 10-1294O.

14. AND STRENGTHENING WORK, SEE 10-1294K THROUGH 10-1294O.

17. ALL EXISTING SPANS AND OCS IMPERMEABLE TO BE REMOVED ARE SHOWN. THE CONTRACTOR SHALL SALVAGE EXISTING HARDWARE UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER.

SHALL PROVIDE APPROPRIATE JUNCTIONS, DETAIL 12, AND INSULATORS, DETAIL 112, UNLESS INDICATED ON THE GENERALIZATION DETAIL 100. ALL BLOWOUT ASSEMBLY, DETAIL 114, SHALL BE PROVIDED ON THE FIRST ISOLATED RUNNER SECTION OF NEW CROSSOVERS, SECTION INSULATORS, AND FUSES AND CROSSOVER ASSEMBLIES. SEE STD DWG 10-101.

18. EXISTING FUSES TO BE REMOVED AND THOSE ATTACHED TO JOINT WOOD POLE SHALL BE TESTED IN THE SPECIFICATIONS.

SHALL WORK PROPOSED LOCATION OF W/AF GUIDES IN THE FIELD AND REQUEST INSPECTION & CONCURRENCE FROM THE W/AFS OF ADJACENT UTILITIES PRIOR TO STARTING WORK.

OVERHEAD NOTES

1. EXISTING POLE/ EVENTU TO REMAIN.

2. PROVIDE STEEL TROLLEY POLE WITH FOUNDATION AS SPECIFIED ON THE OCS STD DWG 10-12971, DET 2.

3. FOR COMBINED TROLLEY POLE WITH STRENGTHENING AND/ OR FEEDER RIBBON, DET 94, DET 8.

4. FOR COMBINED TROLLEY POLE WITH STRENGTHENING AND/ OR TRAFFIC SIGN FOUNDATION, DET 94, DET 8. PROVIDE 12" X 12" CONCRETE BEAMS AND COLUMNS IN CONDUIT, ELBOW, AND COUPLERS AS SHOWN FOR TRAFFIC SIGNAL.

5. CLEAN AND PAINT EXISTING STEEL POLE.

6. PROVIDE SIGNAL MOUNT ARM CONNECTION ON POLE. SEE CALLINGS STD DWG 10-12971, DET 8.

7. REMOVE AND DEPOSE OF EXISTING CONCRETE STEEL POLE BY CUTTING 3' 1 SIDE.

8. REMOVE AND SALVAGE EXISTING POLE AND REMOVE FOUNDATION ENTIRELY.

9. EXISTING EVENTU TO BE REMOVED BY OTHERS.

10. REMOVE AND DEPOSE OF EXISTING POLE AND FOUNDATION ENTIRELY.

11. PROVIDE CROSSARM AT POLE. SEE STD DWG 10-12971.

12. PROVIDE 1-1/2" IN DIAM FROM INTERIOR OF POLE TO 3/4" BEHIND POLE TO TOWARD PROPERTY LINE AND PERPENDICULAR TO STREET.

13. REDUCE (8) SPANS TO (6) POLE AND ADJUST TENSION AND/ OR CLAMP TO ACHIEVE THE REQUIRED TROLLEYWIRE HEIGHT.

14. FOR EXTERNAL WIRE CONDUIT ARRANGEMENT AT POLE. SEE STD DWG 10-145.

15. LOCATE EXISTING 2 IN DIAM AND INTERCEPT WITH NEW CONDUIT OF SAME SIZE SHALL LIMIT THE EXCAVATION WORK WITHIN THE SHERWAY LIMIT UNLESS THE IS NOT UNDER EXCAVATION WORK AREA.

16. CONTACT UTILITY AGENCIES TO TRANSFER ATTACHMENTS BEFORE REMOVING EX

17. DESIGN, FINISH, AND INSTALL SHIP-SHERWAY BRACKET POLE FOUNDATION REMOVE EXISTING FOUNDATION AND FOUNDATION SHALL COMPLY WITH THE REQUIREMENTS OF THE CODES AND REGULATIONS.

a. THE FOUNDATION DESIGN SHALL COMPLY WITH THE REQUIREMENTS OF THE CODES AND REGULATIONS.

b. THE FOUNDATION DESIGN SHALL BE DESIGNED TO WITHSTAND THE MAXIMUM WIND FOR THE POLE TYPE AND RATED.

c. FOR ANCHOR BOLTS AND POLE CRITERIA, SEE STANDARD DRAWING 10-1294K.

d. CONTRACTOR TO FIELD VERIFY ALL EXISTING SHERWAY AND SHERWAY OF FOUNDATION DESIGN SHALL ACCOMMODATE THE EXISTING UTILITIES IN PLACE.

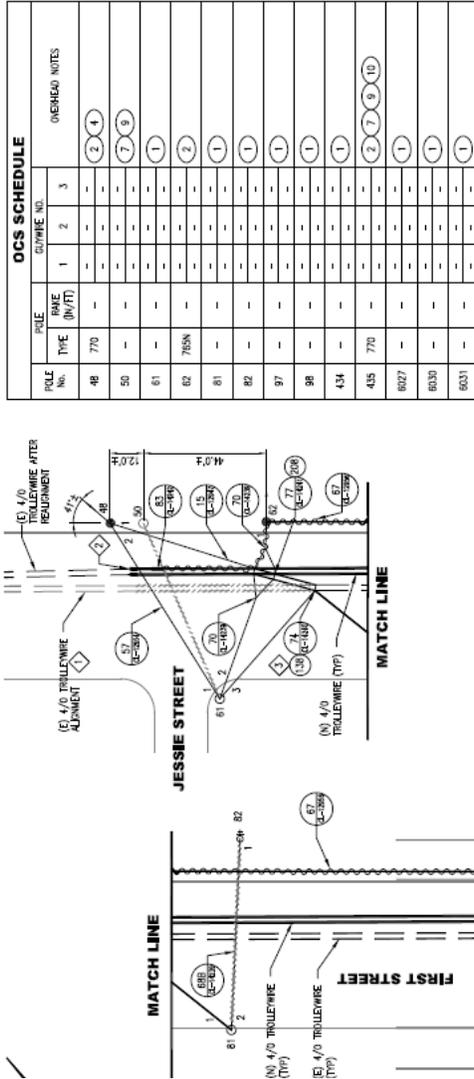
f. PROVIDE WATERPROOFING AND RESTORE SHERWAY TO MATCH EXISTING.

DESIGNED BY	
CHECKED BY	
DATE	
SCALE	
PROJECT	
NO.	
REVISED	



CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
 APPROVED

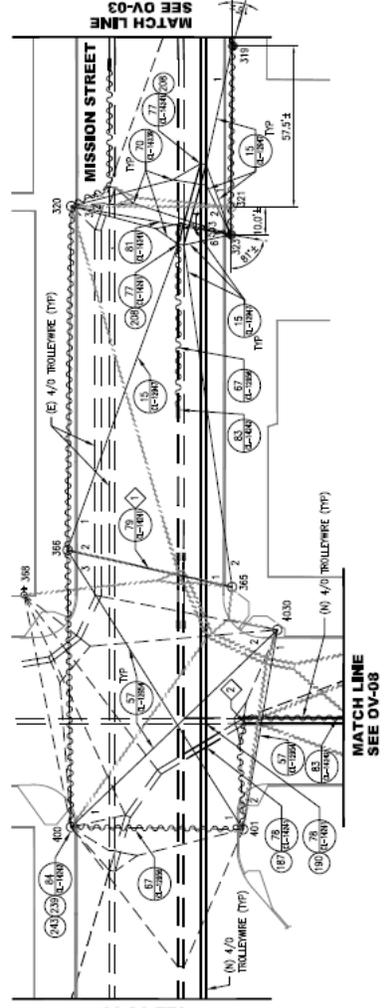
TROLLEY COACH SYSTEM
 TRANSBAY TRANSIT CENTER F
 NEW TRANSIT CENTER



NOTES

OCS SCHEDULE						OVERHEAD NOTES:
POLE No.	POLE TYPE	POLE SIZE (IN/FT)	GYMRE NO.			
			1	2	3	
319	770	-	-	-	-	(2)
320	-	-	-	-	-	(1)
321	-	-	-	-	-	(7) (8)
323	770	-	-	-	-	(2) (4)
365	-	-	-	-	-	(1)
366	-	-	-	-	-	(1)
368	-	-	-	-	-	(1)
400	-	-	-	-	-	(1)
401	-	-	-	-	-	(1)
4030	-	-	-	-	-	(1)

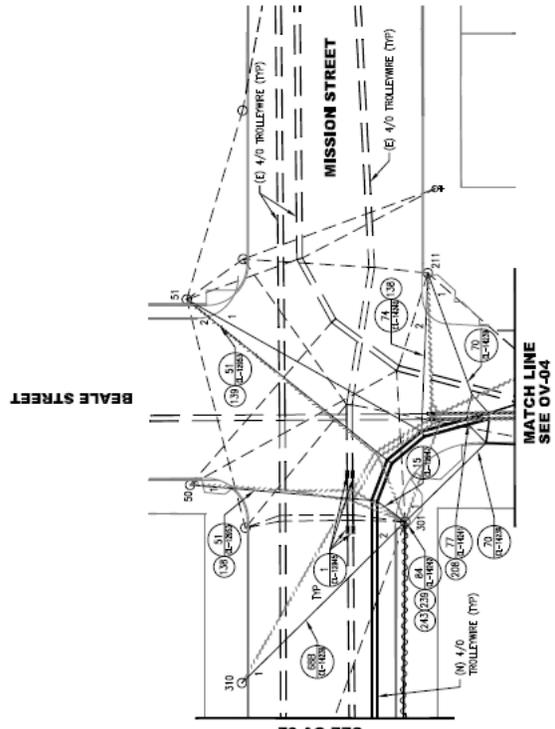
FREMONT STREET



NOTES:

OCS SCHEDULE

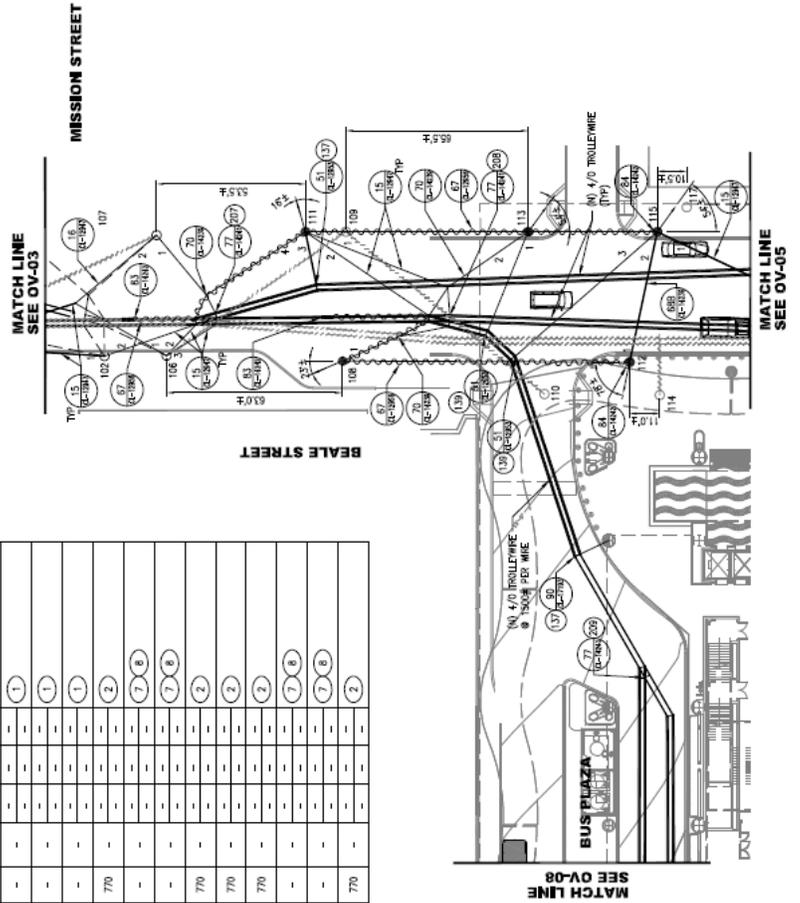
POLE No.	FILE TYPE	CUTWIRE NO.			OVERHEAD NOTES
		1	2	3	
50	-	-	-	-	(1)
51	-	-	-	-	(1)
211	-	-	-	-	(1)
301	-	-	-	-	(1)
310	-	-	-	-	(1)



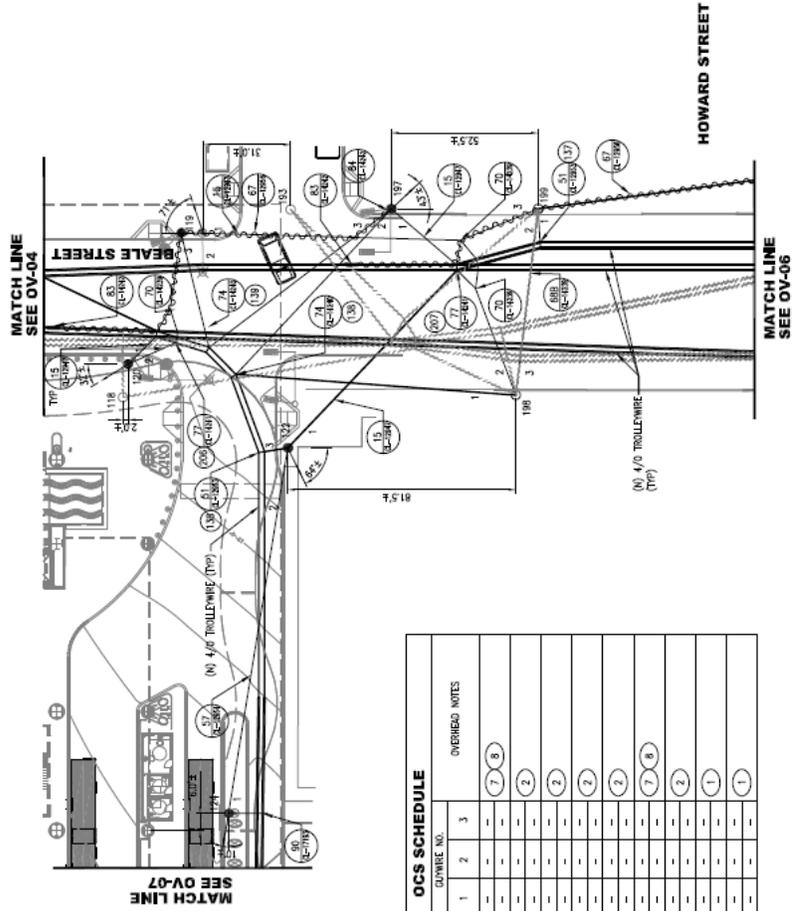
NOTES:

OCS SCHEDULE

FILE No.	POLE TYPE	Pole Size (IN/FT)	CUMWIRE NO.			OVERHEAD NOTES
			1	2	3	
102	-	-	-	-	-	1
106	-	-	-	-	-	1
107	-	-	-	-	-	1
108	770	-	-	-	-	2
109	-	-	-	-	-	7, 8
110	-	-	-	-	-	7, 8
111	770	-	-	-	-	2
112	770	-	-	-	-	2
113	770	-	-	-	-	2
114	-	-	-	-	-	7, 8
115	-	-	-	-	-	7, 8
117	770	-	-	-	-	2



NOTES



POLL No.	PILE NAME (N/P)	OWIRE NO.			OVERHEAD NOTES
		1	2	3	
118	-	-	-	-	(7, 8)
119	770	-	-	-	2
120	770	-	-	-	2
122	770	-	-	-	2
124	731	-	-	-	(7, 8)
183	-	-	-	-	2
197	770	-	-	-	1
198	-	-	-	-	1
199	-	-	-	-	1

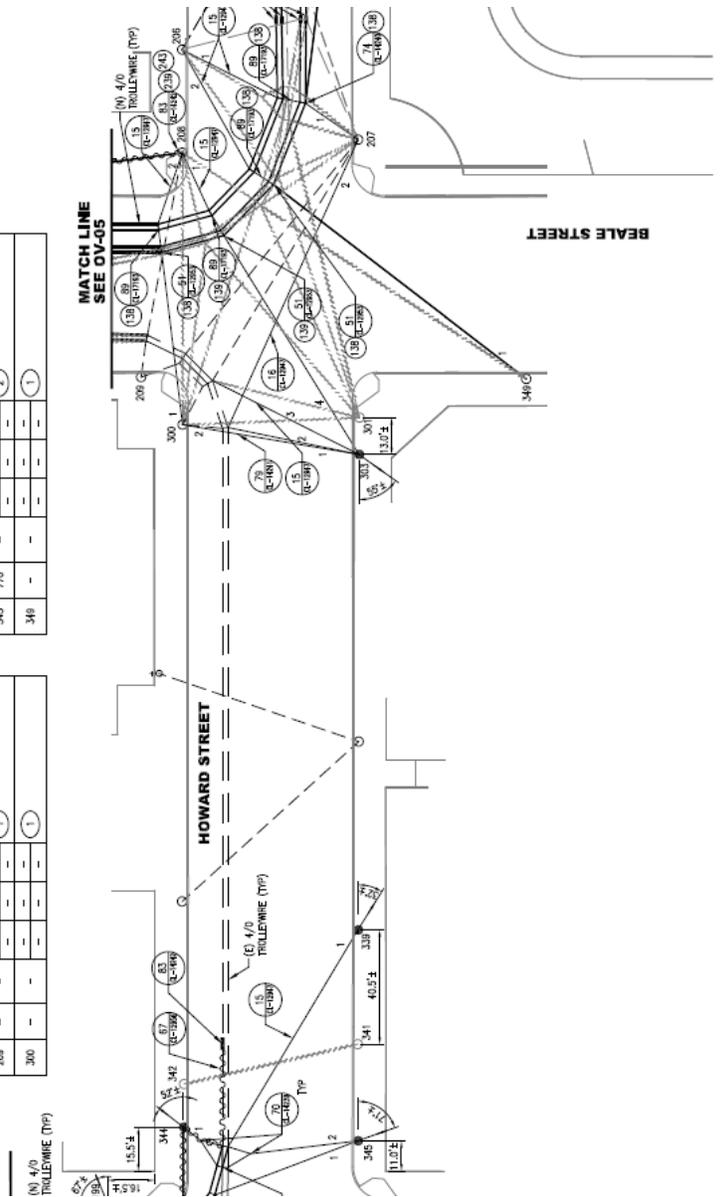
OCS SCHEDULE

POLE No.	POLE TYPE (IN/FT)	SPANNE NO.			OVERHEAD NOTES
		1	2	3	
301	-	-	-	-	(7, 8)
303	770	-	-	-	(2)
339	770	-	-	-	(2)
341	-	-	-	-	(7, 9)
342	-	-	-	-	(7, 9)
344	770	-	-	-	(2)
345	770	-	-	-	(2)
348	-	-	-	-	(1)

OCS SCHEDULE

POLE No.	POLE TYPE (IN/FT)	SPANNE NO.			OVERHEAD NOTES
		1	2	3	
198	770	-	-	-	(2)
199	770	-	-	-	(2)
200	770	-	-	-	(2)
206	-	-	-	-	(1)
207	-	-	-	-	(1)
208	-	-	-	-	(1)
209	-	-	-	-	(1)
300	-	-	-	-	(1)

NOTES



CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

TROLLEY COACH 5
TRANSBAY TRANSIT CENTER
NEW TRANSIT CENTER

NOTES:

POLE No.	POLE TYPE			CLIMBER NO.			OVERHEAD NOTES
	TYPE	RANK (N/P)		1	2	3	
C5	-	-	-	-	-	-	
C6	-	-	-	-	-	-	
C7	-	-	-	-	-	-	
C8	-	-	-	-	-	-	
4029	-	-	-	-	-	-	1
4029	-	-	-	-	-	-	1
4030	-	-	-	-	-	-	1
4032	-	-	-	-	-	-	1
4037	-	-	-	-	-	-	2

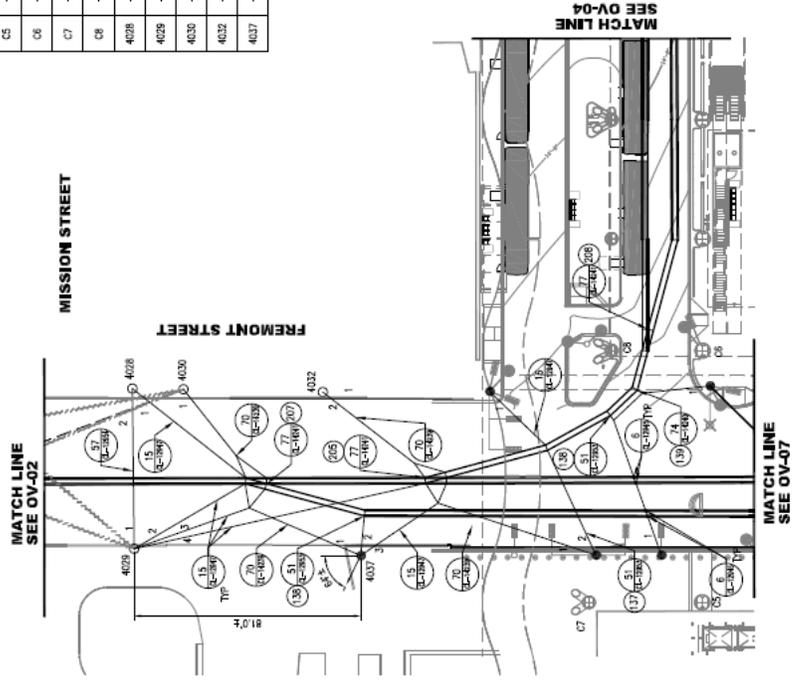


EXHIBIT B-1
SFMTA – Current Sustainable Streets Division Wage Rates
(subject to change)

Class	Job Class Title	(A) Unburdened Hourly Rate (Note 1)	(B) Hourly Fringe Rate (Note 2)	(C) Total Unburdened Hourly Rate (A) + (B)	(D) Approved Overhead Rate	(E) Hourly Overhead (C) * (D)	(F) Fully Burdened Hourly Rate (C) + (E)	(G) Fully Burdened Daily Rate (F) * 8 Hours
1844	Senior Management Assistant	\$41.5875	\$24.02	\$65.61	0.803	52.68	118.29	946.29
5201	Junior Engineer	\$40.1000	\$23.58	\$63.68	0.803	51.14	114.82	918.58
5203	Assistant Engineer	\$45.3250	\$25.84	\$71.16	0.803	57.14	128.31	1,026.46
5207	Associate Engineer	\$52.7250	\$28.77	\$81.49	0.803	65.44	146.93	1,175.44
5211	Engineer/Architect/Landscape Architect	\$70.6500	\$36.41	\$107.06	0.803	85.97	193.03	1,544.24
5212	Engineer/Architect Principal	\$82.0000	\$41.25	\$123.25	0.803	98.97	222.22	1,777.76
5241	Engineer	\$61.0250	\$32.31	\$93.33	0.803	74.94	168.28	1,346.21
5290	Transit Planner IV	\$56.7375	\$30.48	\$87.22	0.803	70.03	157.25	1,258.00
5301	Supervisor, Traffic Painting Program	\$46.4250	\$26.31	\$72.74	0.803	58.41	131.15	1,049.17
5302	Traffic Survey Technician	\$33.3250	\$20.66	\$53.99	0.803	43.35	97.34	778.70
5303	Supervisor, Traffic and Street Signs	\$43.7875	\$25.18	\$68.96	0.803	55.38	124.34	994.72
5306	Traffic Sign Manager	\$51.8125	\$28.38	\$80.19	0.803	64.39	144.58	1,156.67
5362	Engineering Assistant	\$33.8250	\$20.88	\$54.70	0.803	43.93	98.63	789.02
5364	Engineering Associate I	\$37.4625	\$22.45	\$59.91	0.803	48.11	108.02	864.13
5366	Engineering Associate II	\$43.3750	\$25.00	\$68.37	0.803	54.90	123.27	986.20
5380	Student Design Trainee I, Arch., Engr.,	\$23.6500	\$18.02	\$41.67	0.803	33.46	75.14	601.12
5381	Student Design Trainee II, Arch, Engr. &	\$25.3750	\$17.23	\$42.61	0.803	34.21	76.82	614.56
5382	Student Design Trainee III, Arch, Engr, & Planning	\$26.6000	\$17.76	\$44.36	0.803	35.62	79.98	639.85
7238	Electrician Supervisor I	\$49.5750	\$28.25	\$77.83	0.803	62.50	140.33	1,122.61
7242	Painter Supervisor I	\$43.0750	\$25.46	\$68.54	0.803	55.04	123.57	988.59
7243	Parking Meter Repairer Supervisor I	\$38.5000	\$22.68	\$61.18	0.803	49.13	110.31	882.52
7276	Electrician Supervisor II	\$55.2000	\$30.66	\$85.86	0.803	68.94	154.80	1,238.40
7332	Maintenance Machinist	\$38.0875	\$23.28	\$61.37	0.803	49.28	110.64	885.14
7345	Electrician	\$43.9125	\$26.06	\$69.97	0.803	56.18	126.15	1,009.22
7346	Painter	\$35.9250	\$22.37	\$58.30	0.803	46.81	105.11	840.90
7444	Parking Meter Repairer	\$33.0875	\$21.63	\$54.72	0.803	43.94	98.66	789.30
7457	Sign Worker	\$30.5250	\$19.45	\$49.98	0.803	40.13	90.11	720.89
8214	Parking Control Officer	\$27.2875	\$17.84	\$45.13	0.803	36.24	81.36	650.90

Class	Job Class Title	(A) Unburdened Hourly Rate (Note 1)	(B) Hourly Fringe Rate (Note 2)	(C) Total Unburdened Hourly Rate (A) + (B)	(D) Approved Overhead Rate	(E) Hourly Overhead (C) * (D)	(F) Fully Burdened Hourly Rate (C) + (E)	(G) Fully Burdened Daily Rate (F) * 8 Hours
8216	Senior Parking Control Officer	\$32.5875	\$20.13	\$52.72	0.803	42.33	95.05	760.38
9145	Traffic Signal Electrician	\$47.6875	\$27.69	\$75.37	0.803	60.53	135.90	1,087.20
9177	Manager III, Municipal Transportation Ag	\$57.2625	\$32.51	\$89.77	0.803	72.09	161.86	1,294.90

Notes:

1. The Hourly Rates are the base salary for each job classification from the Compensation Manual for the City and County of San Francisco. The actual rates could vary for different employees in the same job classification due to placement within the pay steps for the job classification. The Hourly Rates could also vary due to premiums, overtime, shift differentials, etc. as determined by the MOU governing each job classification.
 2. The Fringe Benefits rates are a projection for each job class. The actual amount is likely to be different.
-

EXHIBIT B-2
SFMTA – Current Transit Division Wage Rates
(subject to change)

Class	Job Class Title	(A) Unburdened Hourly Rate (Note 1)	(B) Hourly Fringe Rate (Note 2)	(C) Total Unburdened Hourly Rate (A) + (B)	(D) Approved Overhead Rate	(E) Hourly Overhead (C) * (D)	(F) Fully Burdened Hourly Rate (C) + (E)	(G) Fully Burdened Daily Rate (F) * 8 Hours
1446	Secretary II	\$30.6750	\$19.30	\$49.98	1.385	\$69.22	\$119.20	\$953.58
1450	Executive Secretary I	\$33.4000	\$20.48	\$53.88	1.385	\$74.62	\$128.50	\$1,028.03
5201	Junior Engineer	\$40.1000	\$23.58	\$63.68	1.385	\$88.20	\$151.89	\$1,215.10
5203	Assistant Engineer	\$45.3250	\$25.84	\$71.16	1.385	\$98.56	\$169.72	\$1,357.80
5207	Associate Engineer	\$52.7250	\$28.77	\$81.49	1.385	\$112.87	\$194.36	\$1,554.87
5211	Engineer/Architect/Landscape Architect	\$70.6500	\$36.41	\$107.06	1.385	\$148.28	\$255.34	\$2,042.71
5212	Engineer/Architect Principal	\$82.0000	\$41.25	\$123.25	1.385	\$170.70	\$293.95	\$2,351.61
5241	Engineer	\$61.0250	\$32.31	\$93.33	1.385	\$129.26	\$222.59	\$1,780.76
5290	Transit Planner IV	\$56.7375	\$30.48	\$87.22	1.385	\$120.79	\$208.01	\$1,664.07
5362	Engineering Assistant	\$33.8250	\$20.88	\$54.70	1.385	\$75.76	\$130.46	\$1,043.72
5364	Engineering Associate I	\$37.4625	\$22.45	\$59.91	1.385	\$82.97	\$142.88	\$1,143.06
5366	Engineering Associate II	\$43.3750	\$25.00	\$68.37	1.385	\$94.70	\$163.07	\$1,304.54
5502	Project Manager I	\$60.8250	\$32.22	\$93.05	1.385	\$128.87	\$221.91	\$1,775.32
5504	Project Manager II	\$70.3875	\$36.30	\$106.69	1.385	\$147.76	\$254.45	\$2,035.57
6318	Construction Inspector	\$45.7625	\$26.03	\$71.79	1.385	\$99.43	\$171.22	\$1,369.74
6319	Senior Construction Inspector	\$50.4500	\$27.80	\$78.25	1.385	\$108.37	\$186.62	\$1,492.95

Notes:

1. The Hourly Rates are the base salary for each job classification from the Compensation Manual for the City and County of San Francisco. The actual rates could vary for different employees in the same job classification due to placement within the pay steps for the job classification. The Hourly Rates could also vary due to premiums, overtime, shift differentials, etc. as determined by the MOU governing each job classification.
2. The Fringe Benefits rates are a projection for each job class. The actual amount is likely to be different.