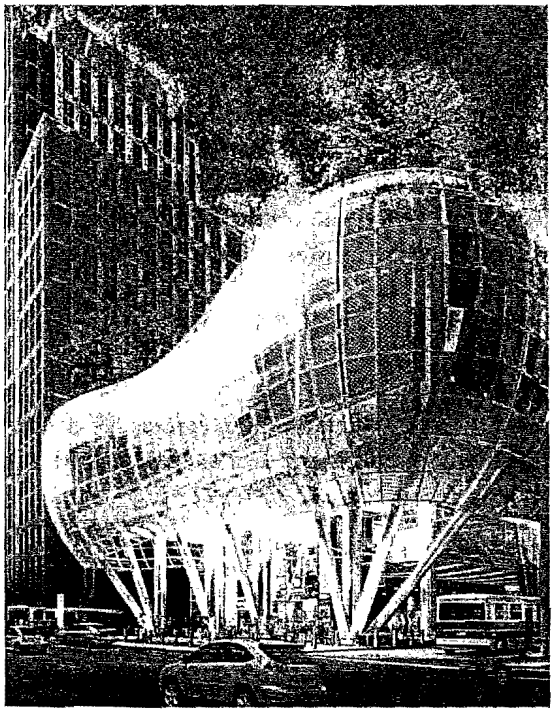
SFMTA | Municipal Transportation Agency

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

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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.

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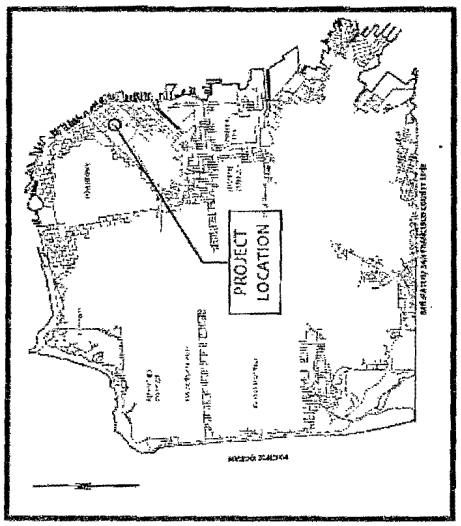
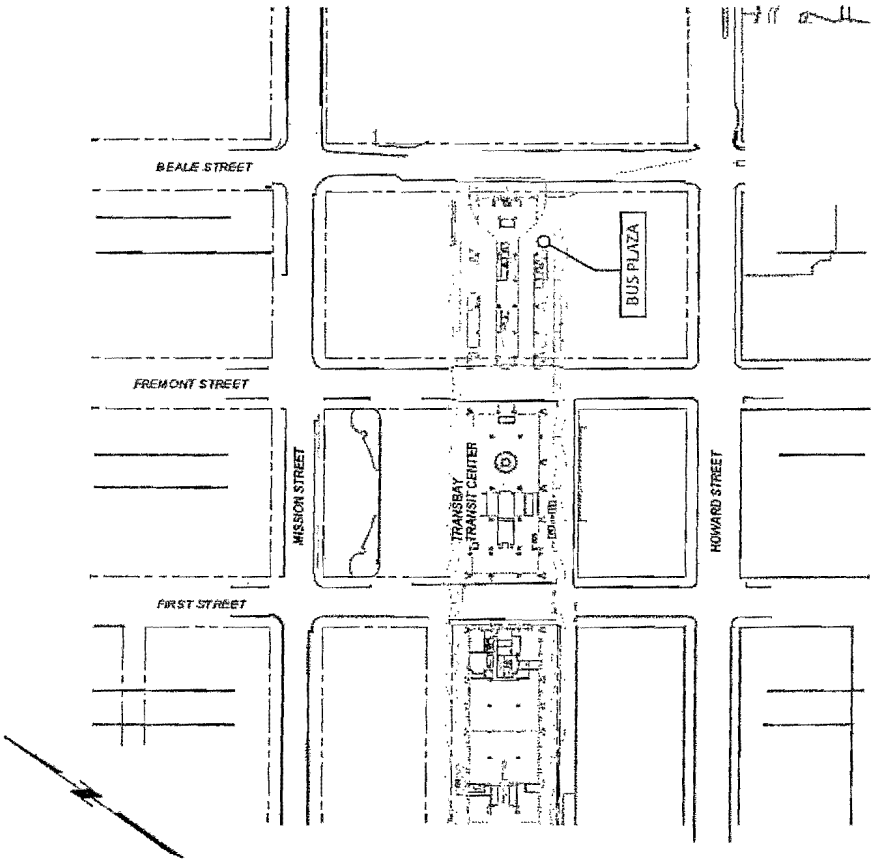


LOCATION MAP



VICINITY MAP

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.

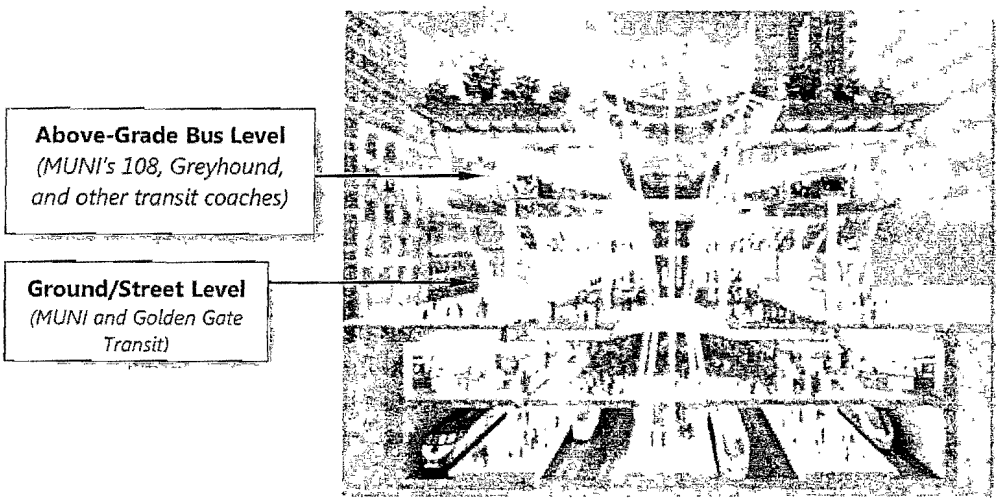


Figure 1: Cross Section View of Transbay Transit Center
Rendering courtesy of TJPA

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.

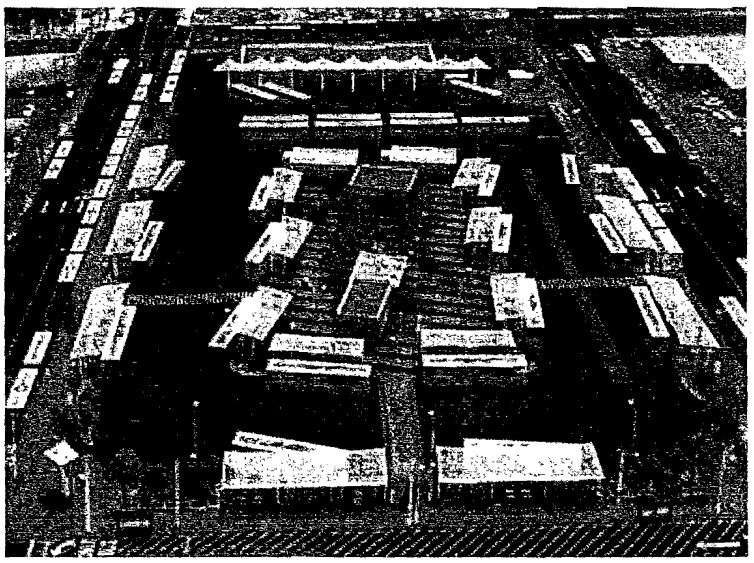


Figure 2: Temporary Transbay Transit Center
Rendering courtesy of TJPA

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, 2009[2] and July 19, 2007[3], 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.

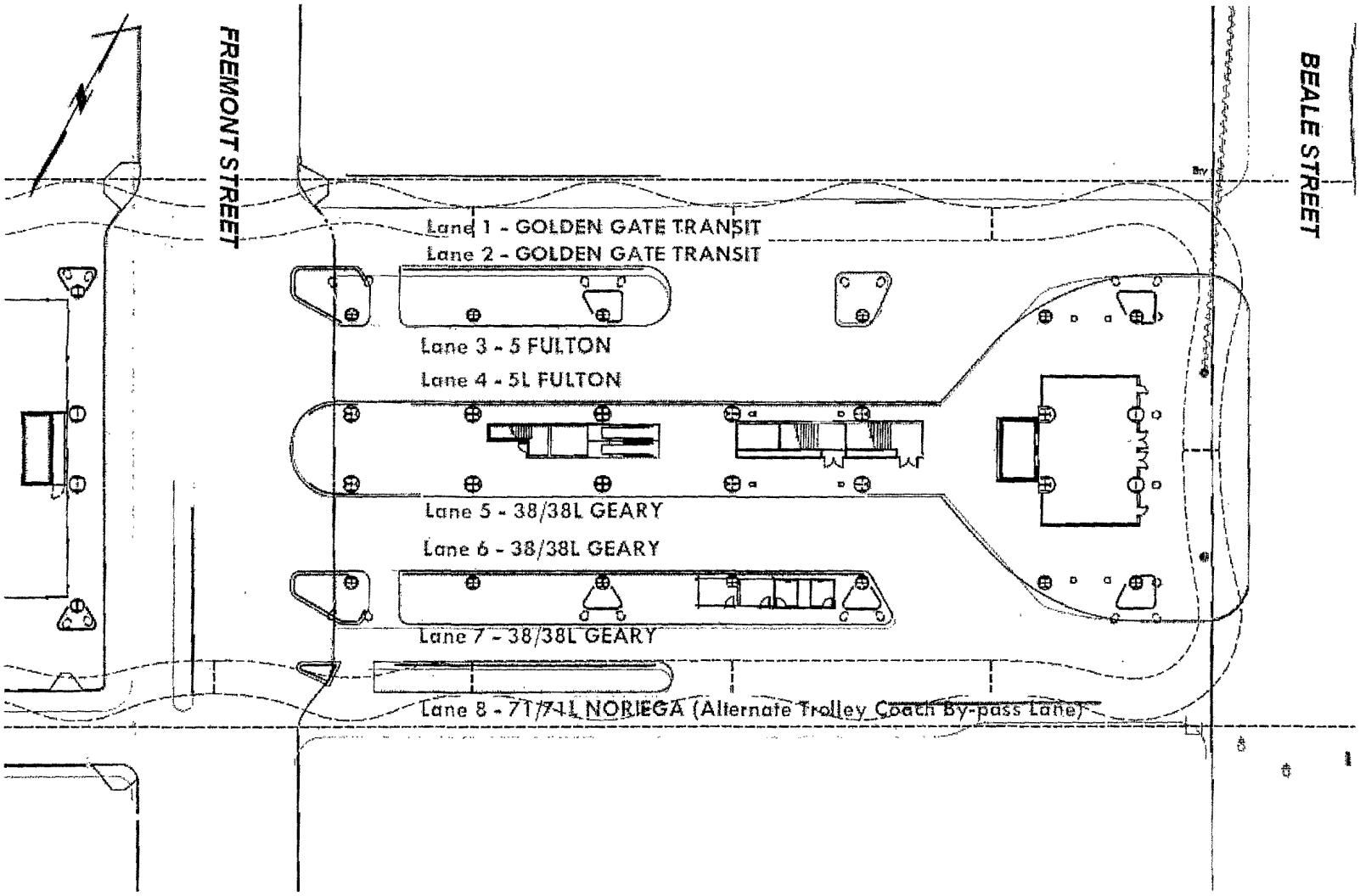


Figure 3: Muni Lane Allocations

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 requirements[4]. 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

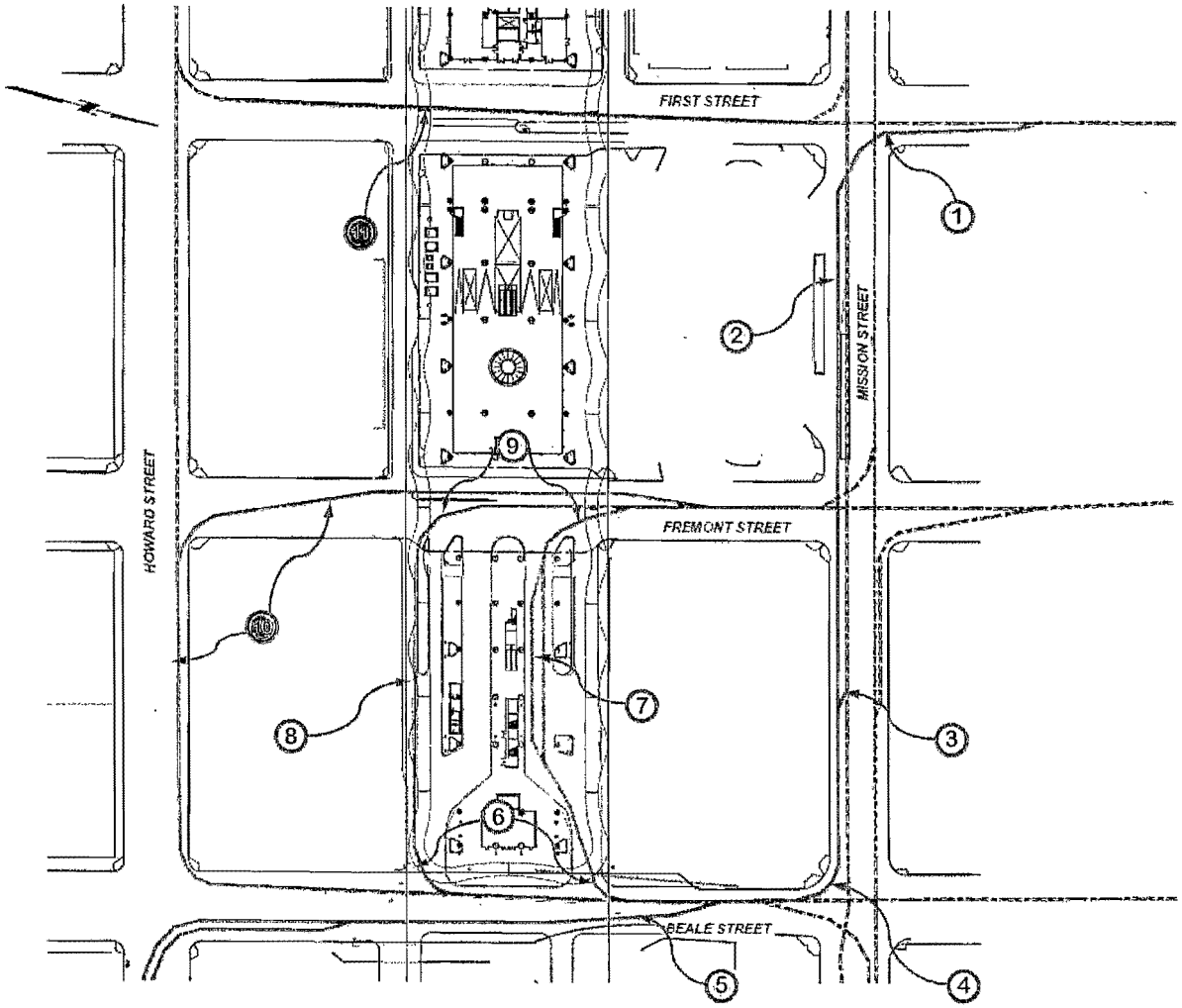
1. Provide four new positive and four new negative feeder cables along Mission Street between Anthony Street and Beale Street.

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.



LEGEND

- LOW CEILING AREA – Direct OCS attachment to ceiling
- EXISTING TROLLEY WIRES
- NEW TROLLEY WIRES
- (1) NEW RIGHT TURN TROLLEY WIRES (FIRST ST TO MISSION ST)
- (2) NEW PARALLEL TROLLEY WIRES
- (3) NEW CROSSOVER TROLLEY WIRES
- (4) RE-CONFIGURE EXISTING RIGHT TURN TROLLEY WIRES
- (5) RE-CONFIGURE EXISTING LEFT TURN TROLLEY WIRES
- (6) NEW ENTRY TROLELY WIRES
- (7) LAYOVER TROLLEY WIRES (Lanes 3 and 4)
- (8) LAYOVER TROLLEY WIRES (Lane 8)
- (9) NEW EXIT TROLLEY WIRES
- (10) NEW NON-REVENUE OR EMERGENCY BY-PASS LOOP
- (11) NEW TROLLEY WIRE WITH SPANS SUPPORTED BY COLUMNS

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)

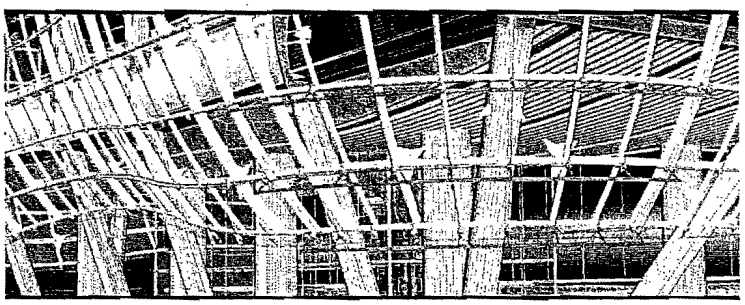


Figure 5: Typical View of Awning Protection Bars (Shown in orange color)
Rendering courtesy of TJPA

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
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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 EQUIPMENT01630 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 Auxilary 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-Grafitti 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)

870

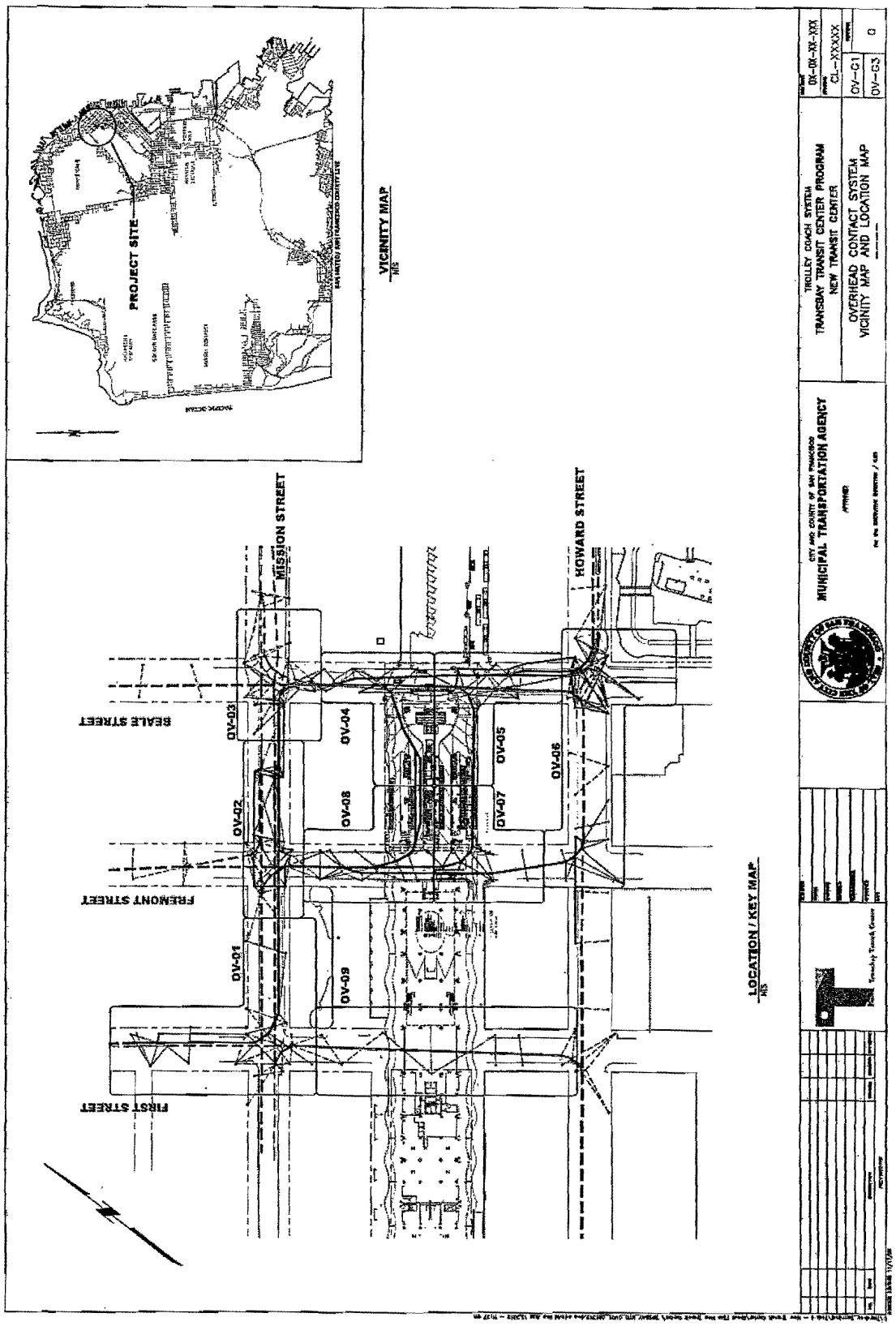
Traction Power System Estimate Cost

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


PROJECT SITE
VICINITY MAP
NTS
MISSION STREET
HOWARD STREET
BEALE STREET
FREMONT STREET
FIRST STREET
OV-01
OV-02
OV-03
OV-04
OV-05
OV-06
OV-07
OV-08
OV-09
LOCATION / KEY MAP
NTS
CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER
OVERHEAD CONTACT SYSTEM
VICINITY MAP AND LOCATION MAP
OV-XX-XX-XXX
CL-XXXXX
OV-G1
OV-G3
0

GENERAL NOTES

1. NOT USED.
2. PULLOFFS WITHOUT TENSIONS INDICATED ARE FOR ALIGNMENT PURPOSES ONLY. THE MINIMUM TENSION SHALL BE 100 LBS.
3. ALL GUYWIRES 12" AND ABOVE TROLLEYWIRE SHALL BE PROVIDED WITH "WIRE GUARD" SECURED WITH TIE WRAP PER DETAIL 4, SEE STD DWG CL-12915.
4. FOR GUYWIRE DEAD END, STANDOFF, ITEM 8, SHALL ONLY BE USED WHERE THERE IS INSUFFICIENT INSTALLATION SPACE FOR A THIMBLE. ITEM 7, THIMBLE SHALL NOT BE USED IN ORDER TO FIT INTO SMALLER SPACE.
5. WHERE A GUYWIRE IS 12" OR LESS ABOVE TROLLEYWIRE, AN ADJUSTABLE HEIGHT TROLLEY CLAMP WITH INSULATOR, ITEM 76, SHALL BE INSTALLED PER DETAIL 8, SEE STD DWG CL-12940.
6. NOT USED.
7. INSTALL ALL GUYWIRES TO PROVIDE SUFFICIENT TAIL AT ANY JUNCTION FOR FINAL ADJUSTMENT. THE CONTRACTOR SHALL CUT THIS TAIL TO A MINIMUM OF 2" AFTER PERFORMING THE FINAL ADJUSTMENT OF THE OVERHEAD CONTACT SYSTEM.
8. WHENEVER INSULATION IS REQUIRED AT GUYWIRES, PORCELAIN INSULATOR, ITEM 14, SHALL BE USED, UNLESS OTHERWISE NOTED.
9. GUYWIRE TENSIONS AND POLE BAND HEIGHTS INDICATED ON THE DRAWINGS SHALL BE USED AS A GUIDE ONLY. THE CONTRACTOR SHALL FIELD ADJUST GUYWIRE TENSIONS AND POLE BAND HEIGHTS TO ACHIEVE THE REQUIRED TROLLEYWIRE TENSION, HEIGHT, AND ALIGNMENT.
10. NEW TROLLEYWIRES AND GUYWIRES SHALL BE PULLED TO THE SPECIFIC TENSIONS SHOWN ON THE DRAWINGS FOR INSTALLATION AT 60 °F. DIFFERENTIAL DEAD END TENSIONS SHALL BE ADJUSTED IN THE FIELD TO ACHIEVE THE INDICATED TROLLEYWIRE TENSIONS.
11. NEW TROLLEYWIRES SHALL BE INSTALLED AT A HEIGHT OF 18.5' ± 3" ABOVE STREET PAVEMENT AT SUPPORT POINTS, UNLESS OTHERWISE NOTED.
12. ALL NEW 4/0 TROLLEYWIRES SHALL BE TENSIONED TO 3000 LBS PER WIRE, UNLESS OTHERWISE NOTED.
13. ALL NEW 2/0 TROLLEYWIRES SHALL BE TENSIONED TO 2000 LBS PER WIRE, UNLESS OTHERWISE NOTED.
14. AT LOCATIONS WHERE THE 2" SEPARATION BETWEEN TROLLEYWIRES CANNOT BE MAINTAINED, A SPREADER STICK SHALL BE INSTALLED PER DETAIL 13, SEE STD DWG CL-12955.
15. ADJUST THE HEIGHT OF EXISTING TROLLEYWIRES/SPECIAL WORK TO 18.5' ± 3" WHERE EXISTING PULLOFFS/SPANS ARE REPLACED BY NEW PULLOFFS/SPANS.
16. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL MEASURE THE TENSIONS OF ALL EXISTING TROLLEYWIRES TO BE SPLICED TO NEW TROLLEYWIRES OR TO BE ATTACHED TO NEW SPECIAL WORK. IF THE TENSION OF EXISTING TROLLEYWIRES IS LESS OR MORE THAN THE NEW TROLLEYWIRES, THE CONTRACTOR SHALL PROVIDE APPROPRIATE DIFFERENTIAL TENSION DEAD END AS PER DETAIL 10A, SEE STD DWG CL-12953. AS INCIDENTAL WORK, PLANS FOR THE INSTALLATION OF DIFFERENTIAL TENSION DEAD END SHALL BE SUBMITTED TO THE ENGINEER.
17. ALL NEW TROLLEY STEEL POLES SHALL BE RAKED BEFORE APPLYING TENSION. THE AMOUNT OF RAKE SHALL BE SET OPPOSITE TO THE RESULTANT TENSION OR IN THE DIRECTION OF ARROW AS SHOWN ON THE DRAWINGS.
18. NEW POLE BAND, ITEM 261, SHALL BE PROVIDED FOR ALL NEW AND RELOCATED PULLOFFS, TANGENT SPANS, INVERTED SPANS, BRAIL SPANS, EXTENDED SPANS, FEED SPANS, DIFFERENTIAL TENSION DEAD END ASSEMBLIES.
19. THE CONTRACTOR SHALL PROVIDE APPROPRIATE BOS, ITEMS 21 TO 30, AND SPLICERS, ITEMS 31, 32, 33, TO CONNECT TROLLEYWIRES TO SPECIAL WORK ASSEMBLIES AND FOR SPLICING TROLLEYWIRES.
20. THE CONTRACTOR SHALL USE THE PRICES FROM THE SPECIFIC MANUFACTURER FOR ITEMS LISTED ON THE OVERHEAD MATERIAL LIST TO DEVELOP BID/AGREED PRICES, SEE STD DWGS CL-12940, CL-12941, AND CL-12942.
21. FOR TRAFFIC SIGNAL AND STREETLIGHTING WORK, SEE EL-SERIES DRAWINGS.
22. FOR CLARITY, NOT ALL EXISTING SPANS AND OCS HARDWARE TO BE REMOVED ARE SHOWN. THE CONTRACTOR SHALL SALVAGE EXISTING SPANS AND OCS HARDWARE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
23. THE CONTRACTOR SHALL PROVIDE APPROPRIATE JUMPERS, ITEM 13, AND INSULATORS, ITEM 112, WHERE INDICATED ON THE SECTIONALIZING PLAN. A PERMANENT MAGNETIC ARC FLASHOVER ASSEMBLY, ITEM 110, SHALL BE PROVIDED ON THE FIRST INSULATED ELEMENT SECTION OF ALL EXISTING OR NEW CROSSOVERS, SECTION INSULATORS, AND FROGS AND CROSSOVER ASSEMBLIES, SEE STD DWG K-103.
24. ALL OVERBOLTS, EXCEPT EXISTING OVERBOLTS TO BE ABANDONED AND THOSE ATTACHED TO JOINT WOOD POLE, SHALL BE TESTED IN ACCORDANCE WITH THE SPECIFICATIONS.
25. THE CONTRACTOR SHALL MARK PROPOSED LOCATION OF OVS POLES IN THE FIELD AND REQUEST INSPECTION & CONCURRENCE FROM THE ENGINEER AND OWNERS OF ADJACENT UTILITIES PRIOR TO STARTING WORK.

OVERHEAD NOTES

1. EXISTING POLE/ OVERBOLT TO REMAIN.
2. PROVIDE STEEL TROLLEY POLE WITH FOUNDATION AS SPECIFIED ON THE OCS SCHEDULE. SEE STD DWG CL-7935, REV 2.
3. FOR COMBINED TROLLEY POLE WITH STREETLIGHTING AND/ OR FEEDER RISER, SEE STD DWG E-1545, REV 0.
4. FOR COMBINED TROLLEY POLE WITH STREETLIGHTING AND/ OR TRAFFIC SIGNAL, SEE STD DWG E-1545, REV 4. PROVIDE 1-1/2 IN GRS CONDUIT, ELBOW, AND COUPLINGS FOR STREETLIGHTING. PROVIDE 2-2 IN PVC CONDUITS, ELBOWS, AND COUPLINGS INSTEAD OF 1-1/2 IN CONDUIT, ELBOW, AND COUPLING AS SHOWN FOR TRAFFIC SIGNAL.
5. CLEAN AND PAINT EXISTING STEEL POLE.
6. PROVIDE SIGNAL MAST ARM CONNECTION ON POLE, SEE CALTRANS STD DWG ES-7C FOR DETAILS.
7. REMOVE AND DISPOSE OF EXISTING CONCRETE/ STEEL POLE BY CUTTING 3' BELOW FINISHED GRADE.
8. REMOVE AND SALVAGE EXISTING POLE AND REMOVE FOUNDATION ENTIRELY.
9. EXISTING OVERBOLT TO BE REMOVED BY OTHERS.
10. REMOVE AND DISPOSE OF EXISTING POLE AND FOUNDATION ENTIRELY.
11. PROVIDE CROSSARM AT POLE, SEE STD DWG AL-2277.
12. PROVIDE 1-1/2 IN GRSC FROM INTERIOR OF POLE TO 3'± BEYOND POLE FOUNDATION TOWARD PROPERTY LINE AND PERPENDICULAR TO STREET.
13. RELOCATE (E) SIGNS TO OVS POLE AND ADJUST TENSION AND/ OR CLAMP HEIGHT TO ACHIEVE THE REQUIRED TROLLEYWIRE HEIGHT.
14. FOR EXTERNAL RISER CONDUIT ARRANGEMENT AT POLE, SEE STD DWG A-1456.
15. LOCATE EXISTING 2 IN RISER AND INTERCEPT WITH NEW CONDUIT OF SAME SIZE. CONTRACTOR SHALL LIMIT THE EXCAVATION WORK WITHIN THE SIDEWALK UNLESS THE STREET PAVEMENT IS NOT UNDER EXCAVATION MORATORIUM.
16. CONTACT UTILITY AGENCIES TO TRANSFER ATTACHMENTS BEFORE REMOVING EXISTING POLE.
17. DESIGN, FURNISH AND INSTALL SUB-SIDEWALK BASEMENT POLE FOUNDATION (SEE REFERENCE DRAWING CL-12941).
    a. THE FOUNDATION DESIGN SHALL COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE CODES AND REGULATIONS.
    b. THE FOUNDATION SHALL BE DESIGNED TO WITHSTAND THE MAXIMUM ALLOWABLE LOAD FOR THE POLE TYPE INDICATED.
    c. FOR ANCHOR BOLTS AND POLE CAMBERS, SEE STANDARD DRAWING CL-2971, REV 2.
    d. CONTRACTOR TO FIELD VERIFY ALL EXISTING SIDEWALK AND BASEMENT UTILITIES.
    e. THE FOUNDATION DESIGN SHALL ACCOMMODATE THE EXISTING UTILITIES TO REMAIN IN PLACE.
    f. PROVIDE WATERPROOFING AND RESTORE SIDEWALK TO MATCH EXISTING.

NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
		REVISIONS			

Transbay Transit Center

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

APPROVED

AS IN EXECUTIVE DIRECTOR / CEO

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

GENERAL NOTES AND OVERHEAD NOTES

PROJECT: GX-GX-XX-XXX
DRAWING: CL-XXXXX
OV-02
OV-03

OVERHEAD ABBREVIATIONS

&	AND
@	AT
AVE	AVENUE
℄	CENTER LINE
DET	DETAIL
DWG	DRAWING
(E)	EXISTING
EA	EACH
°F	FAHRENHEIT
e.g.	FOR EXAMPLE
F/I	FURNISH & INSTALL UNDER THIS CONTRACT
FT & '	FEET
GALV	GALVANIZED
G.O.95	CPUC, GENERAL ORDER No 95
GRSC	GALVANIZED RIGID STEEL CONDUIT
Ht	HEIGHT
HDPE	HIGH DENSITY POLYETHYLENE
I.D.	INSIDE DIAMETER
IMPULSE	IMPULSE BC, INC
in & "	INCH
kcmil	THOUSAND CIRCULAR MILS
LB & lb	POUNDS
LH	LEFT HAND
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
(N)	NEW
NIC	NOT IN CONTRACT
No / #	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OCS	OVERHEAD CONTACT SYSTEM
℄	PROPERTY LINE
REV	REVERSIN
RH	RIGHT HAND
R/D	REMOVE & DISPOSE OF AS CONTRACTOR PROPERTY
R/R	REMOVE & RELOCATE
R/S	REMOVE & SALVAGE
SCH	SCHEDULE
STD	STANDARD
ST	STREET
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
W/	WITH

OVERHEAD LEGEND

	CURB LINE
	PROPERTY LINE
	(E) DRIVEWAY
	(E) CURB RAMP
OR	(E) SPAN POLE
	(E) STEEL (NON-TROLLEY) POLE TO REMAIN
	(E) STEEL TROLLEY POLE TO REMAIN
	(E) STEEL POLE TO BE REMOVED
	(N) STEEL TROLLEY POLE
	REMOVE (E) STEEL POLE AND FOUNDATION ENTIRELY. INSTALL (N) STEEL TROLLEY POLE AND FOUNDATION IN THE LOCATION OF THE (E) POLE
	(E) WOOD POLE (JOINT POLE IF NUMBERED) TO REMAIN
	(E) EYEBOLT TO REMAIN
	(N) EYEBOLT
SEE	DIRECTION TO MAKE POLE (WHERE NO ANGLE IS SHOWN, MAKE POLE PERPENDICULAR TO AND AWAY FROM CURB)
R=22	FEEDER CIRCUIT R=22
1	SEE (N) ITEM NUMBER ON MATERIAL LIST
1	SEE OVERHEAD NOTE 1
1	SEE SHEET NOTE 1
	POLE No ON OCS SCHEDULE
28XX	SPAN OR PULLOFF
	GUYWIRE No ON OCS SCHEDULE
	INTERCEPT (E) CONDUIT
	(E) CONDUIT TO BE ABANDONED AND SEALED
	(N) CONDUIT
	ATTACHMENT POINT
	(N) ANTENNA ASSEMBLY
NE	(N) NEGATIVE AUXILIARY EQUALIZER SPAN CONNECTION
NE	(N) POSITIVE AUXILIARY EQUALIZER SPAN CONNECTION
NF	(N) NEGATIVE AUXILIARY FEED SPAN CONNECTION
NF	(N) POSITIVE AUXILIARY FEED SPAN CONNECTION
E	(N) NEGATIVE EQUALIZER SPAN CONNECTION
E	(N) POSITIVE EQUALIZER SPAN CONNECTION
F	(N) NEGATIVE FEED SPAN CONNECTION
F	(N) POSITIVE FEED SPAN CONNECTION
	(N) CONTROL WIRES/MESSENGER WIRES
	(E) SPAN OR PULLOFF TO REMAIN
	(E) SPAN TO BE REMOVED
	(N) SPAN OR PULLOFF
	NEGATIVE TROLLEYWIRE (SECTIONALIZATION)
	POSITIVE TROLLEYWIRE (SECTIONALIZATION)
	(E) SPLICERS TO REMAIN
	(N) SPLICERS
	(E) TROLLEYWIRE TO REMAIN
	(E) TROLLEYWIRE TO BE REMOVED
	(N) TROLLEYWIRE
	(N) ADJUSTABLE HANGERS AND CLAMPS, TWO EACH OF ITEMS 19 AND 75, AS PER DETAIL 6 SHOWN ON STD DWG CL-12045, CONNECTING TROLLEYWIRE TO SPAN OR PULLOFF
	(N) SWITCH CONTROL RECEIVER
	(E) SECTION INSULATOR
	(E) SECTION INSULATORS WITH JUMPER CONNECTED
	(N) SECTION INSULATOR
	(N) SECTION INSULATORS WITH JUMPER CONNECTED
1 OV-02	DETAIL DESIGNATION No
	PLAN No WHERE DETAIL IS SHOWN. IF CL-(NUMBER) IS INDICATED, SEE DETAIL IN STANDARD DRAWING.
A	SECTION DESIGNATION LETTER
OV-02	PLAN No WHERE SECTION IS SHOWN

OCS SCHEDULE

POLE No	POLE TYPE	POLE RANK (N/FT)	GUYWIRE No 1	2	3	4	5	6	OVERHEAD NOTES
2402	75N	1/8	330 / 22.50	2200 / 21.75	–	–	–	–	7 8 11
2401	75T	3/8	400 / 24.00	–	–	–	–	–	7 8 11

GUYWIRE TENSION (LBS) — GUYWIRE NUMBER — SEE OVERHEAD NOTES
POLE BAND CLAMP HEIGHT (FT)
POLE TYPE
POLE RANK (N/FT)
POLE IDENTIFICATION NUMBER

No	DATE	DESCRIPTION REVISIONS	DRAWN	CHECKED	APPROVED

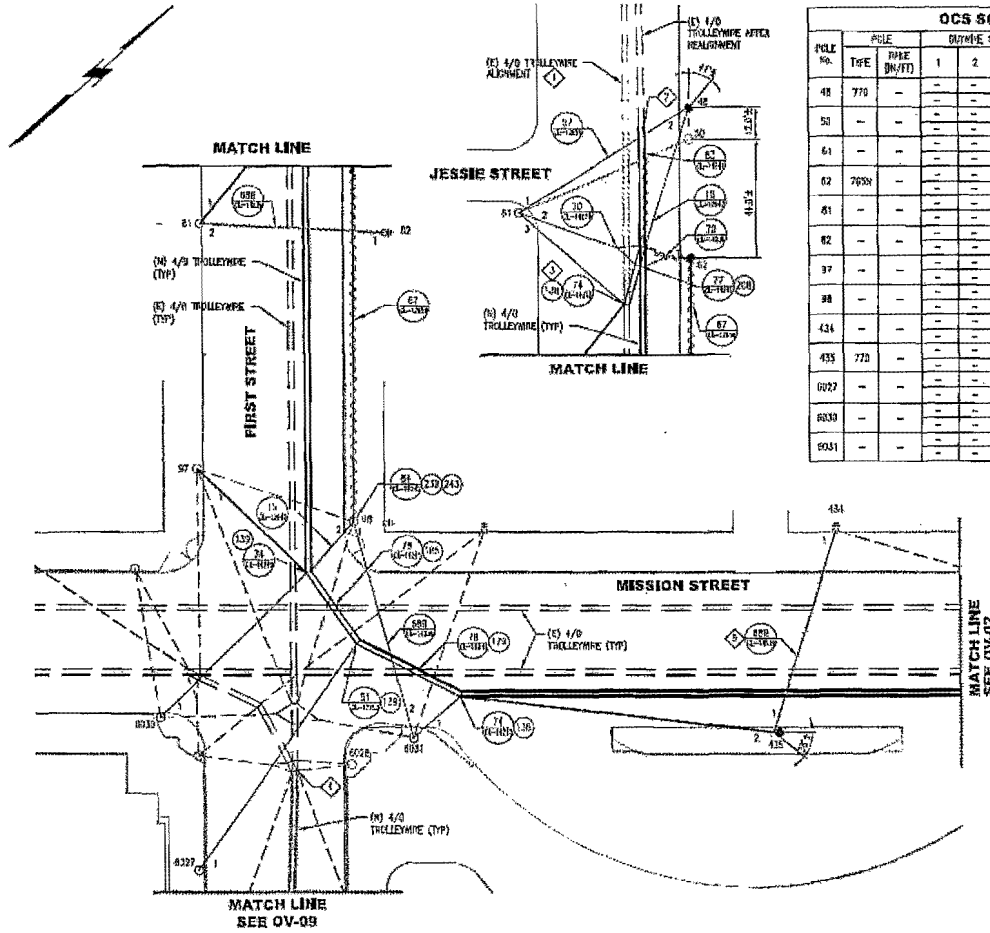
Transbay Transit Center

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

OVERHEAD ABBREVIATIONS AND LEGEND

DX-DX-XX-XXX
CL-XXXX
OV-G3
OV-G3



OCS SCHEDULE

POLE No.	POLE TYPE	POLE DIR/FT	OUTWIRE NO. 1	2	3	OVERHEAD NOTES
48	770	–	–	–	–	2 4
50	–	–	–	–	–	7 9
61	–	–	–	–	–	1
62	765N	–	–	–	–	2
81	–	–	–	–	–	1
82	–	–	–	–	–	1
97	–	–	–	–	–	1
98	–	–	–	–	–	1
434	–	–	–	–	–	1
435	770	–	–	–	–	2 7 9 18
6027	–	–	–	–	–	1
6030	–	–	–	–	–	1
6031	–	–	–	–	–	1

NOTES:

20' 0 20' 40'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	REVISED	CHECKED	APPROVED
		REVISIONS			

Transbay Transit Center

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

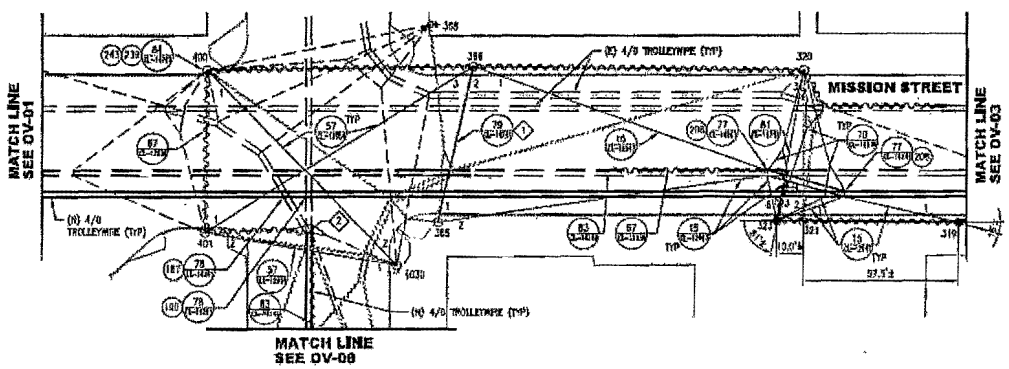
TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE INTERSECTION LAYOUT
FIRST ST AND MISSION ST

DRAWING 0X-0X-XX-XXX
SHEET CL-XXXX
CV-01
OV-XX

NOTES:

OCS SCHEDULE						
POLE No.	POLE TYPE	POLE RAKE (IN/FT)	GUYWIRE NO. 1	GUYWIRE NO. 2	GUYWIRE NO. 3	OVERHEAD NOTES
319	770	–	–	–	–	2
320	–	–	–	–	–	1
321	–	–	–	–	–	7 6
323	770	–	–	–	–	2 4
355	–	–	–	–	–	1
356	–	–	–	–	–	1
358	–	–	–	–	–	1
400	–	–	–	–	–	1
401	–	–	–	–	–	1
1030	–	–	–	–	–	1



REVISIONS					
NO.	DATE	DESCRIPTION	REVIEWED	CHECKED	APPROVED

Transbay Transit Center

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

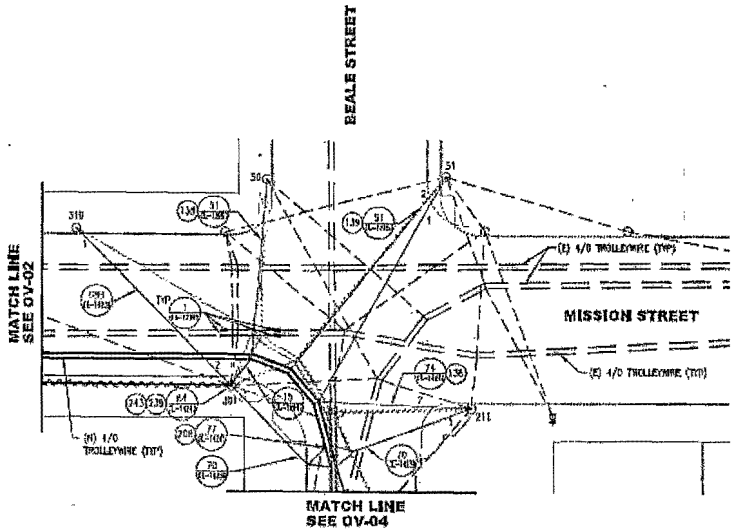
TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE AND SPAN PLAN
MISSION ST: FROM FIRST ST TO BEALE ST

CONTRACT: OX-OX-XX-XXX
DRAWING: CL-XXXX
OV-02
OV-XX

NOTES:

OCS SCHEDULE						
POLE No.	POLE TYPE	POLE RAKE (IN/FT)	CURVE NO. 1	2	3	OVERHEAD NOTES
50	-	-	-	-	-	1
51	-	-	-	-	-	1
211	-	-	-	-	-	1
301	-	-	-	-	-	1
316	-	-	-	-	-	1



20' 0 20' 40'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
		REVISIONS			

Transbay Transit Center

DRAWN
DESIGNED
CHECKED
TRACEDBY
APPROVED
DATE

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
APPROVED
for the EXECUTIVE DIRECTOR / CEO

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

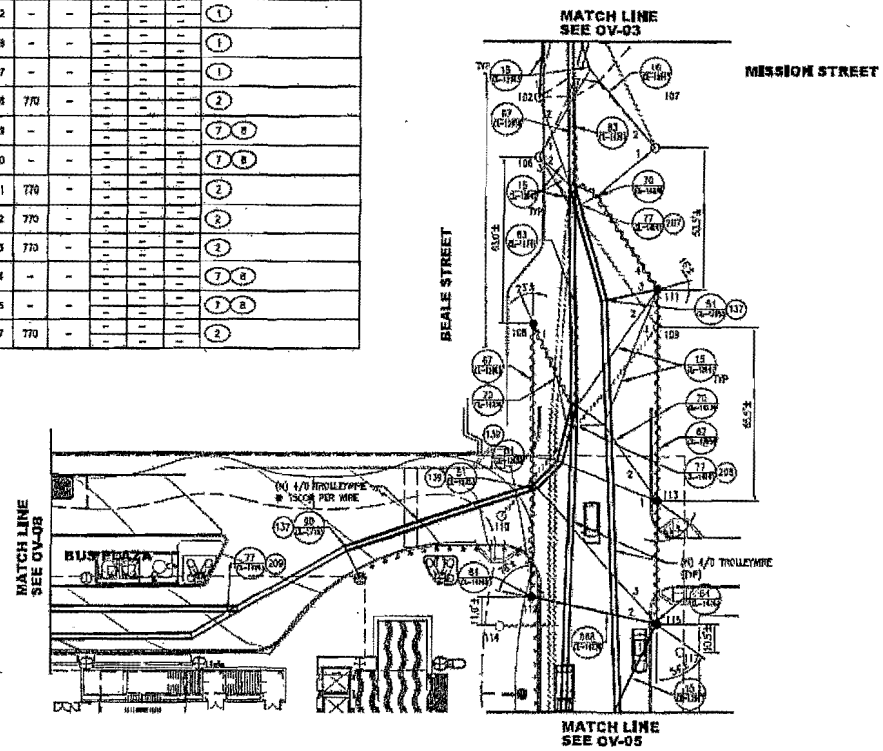
TROLLEY WIRE INTERSECTION LAYOUT
BEALE ST AND MISSION ST

CONTRACT 0X-0X-XX-XXX
DWG CL-XXXXX
OV-03
OV-XX

NOTES:

OCS SCHEDULE

POLE No.	POLE TYPE	POLE BASE (N/FT)	GUYWIRE NO. 1	2	3	OVERHEAD NOTES
102	–	–	–	–	–	1
108	–	–	–	–	–	1
107	–	–	–	–	–	1
106	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



20' 0 20' 40'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
		REVISIONS			

Transbay Transit Center

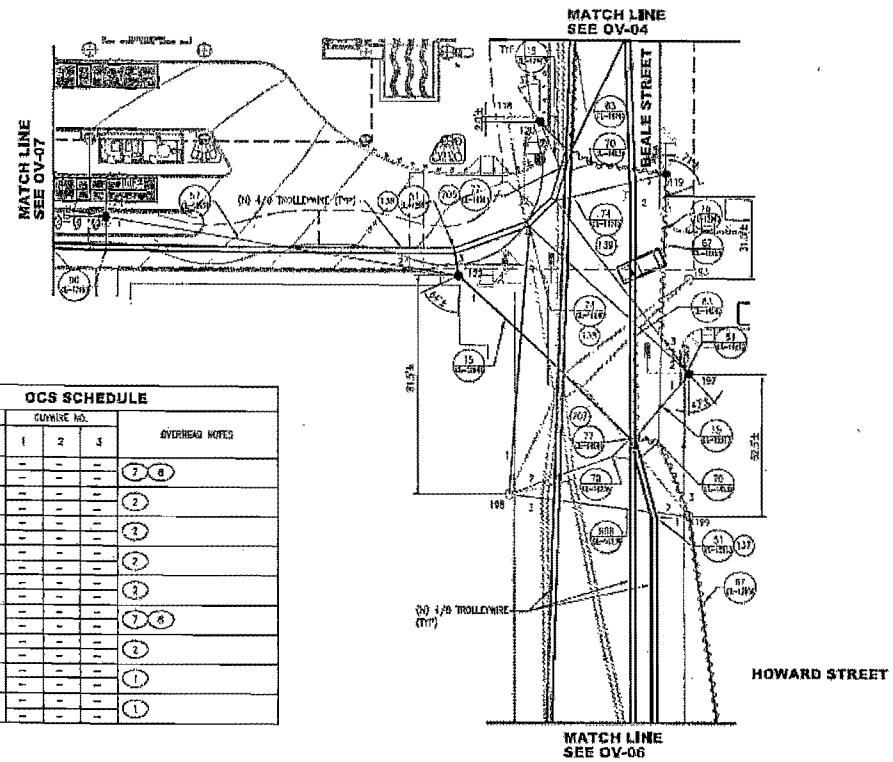
CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE INTERSECTION LAYOUT

DX-DX-XX-XXX
CL-XXXX
OV-04
OV-XX

NOTES:



OCS SCHEDULE

POLE No.	POLE TYPE	POLE RAKE (IN/FT)	CONWIRE NO. 1	2	3	OVERHEAD NOTES
118	–	–	–	–	–	7 8
119	770	–	–	–	–	2
120	770	–	–	–	–	2
122	770	–	–	–	–	2
124	731	–	–	–	–	2
193	–	–	–	–	–	7 8
197	770	–	–	–	–	2
198	–	–	–	–	–	1
199	–	–	–	–	–	1

GRAPHIC SCALE

NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
		REVISIONS			

Transbay Transit Center

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE INTERSECTION LAYOUT

CONTRACT OX-OX-XX-XXX
DWG. CL-XXXX
OV-05
OV-XX

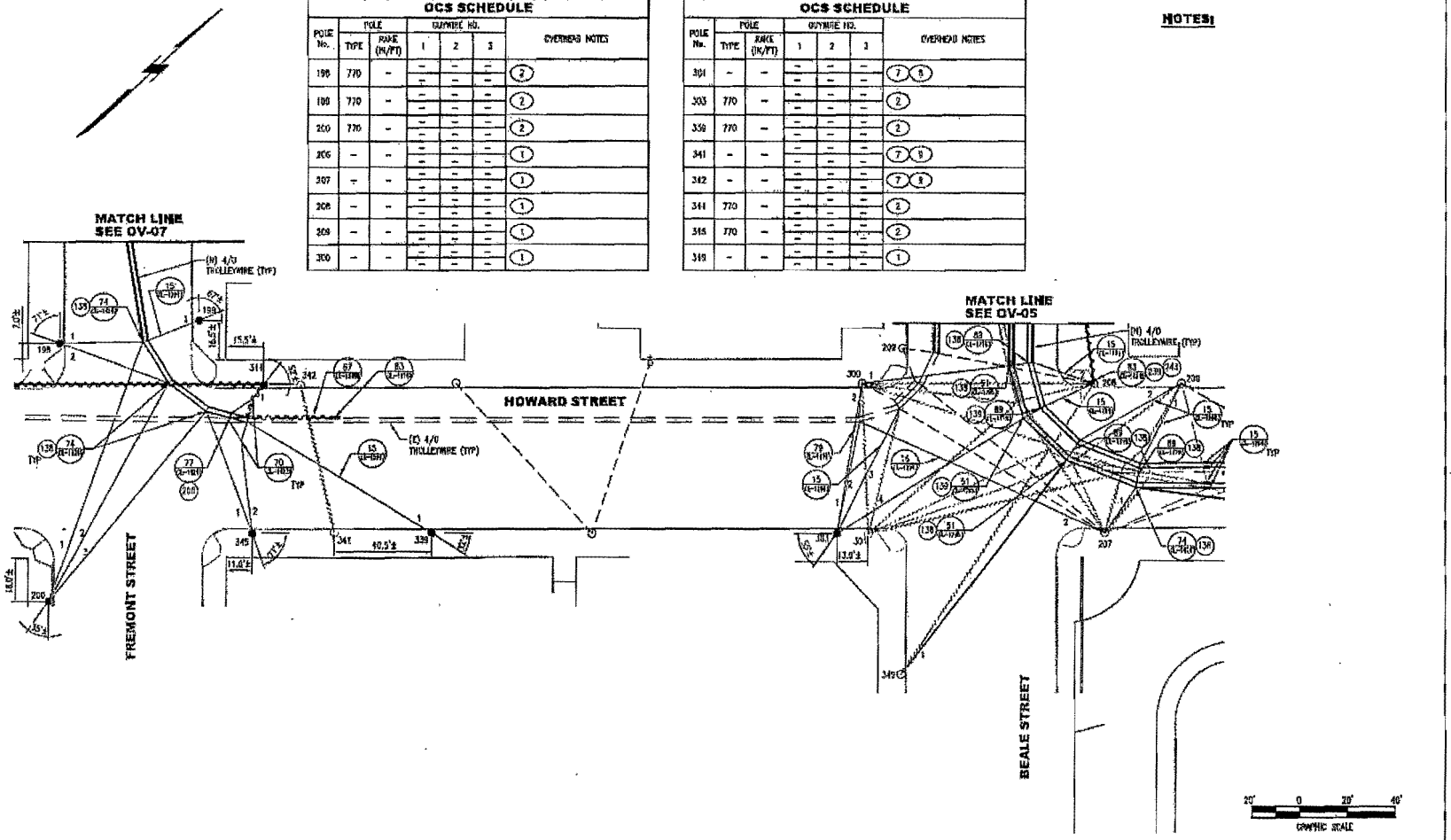
OCS SCHEDULE

POLE No.	POLE TYPE	POLE RAKE (IN/FT)	GUYWIRE NO. 1	GUYWIRE NO. 2	GUYWIRE NO. 3	OVERHEAD NOTES
196	770	–	–	–	–	2
198	770	–	–	–	–	2
200	770	–	–	–	–	2
206	–	–	–	–	–	1
207	–	–	–	–	–	1
208	–	–	–	–	–	1
209	–	–	–	–	–	1
300	–	–	–	–	–	1

OCS SCHEDULE

POLE No.	POLE TYPE	POLE RAKE (IN/FT)	GUYWIRE NO. 1	GUYWIRE NO. 2	GUYWIRE NO. 3	OVERHEAD NOTES
301	–	–	–	–	–	7 8
303	770	–	–	–	–	2
339	770	–	–	–	–	2
341	–	–	–	–	–	7 8
342	–	–	–	–	–	7 8
344	770	–	–	–	–	2
345	770	–	–	–	–	2
349	–	–	–	–	–	1

NOTES:



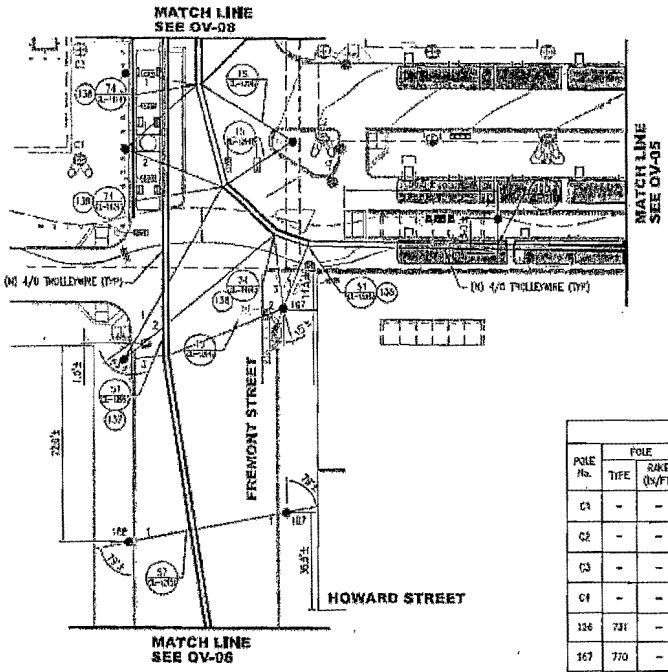
REVISIONS				
NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE AND SPAN PLAN
HOWARD ST: FROM FREMONT ST TO BEALE ST

PROJECT: CX-CX-XX-XXX
PREPD: CL-XXXX
OV-06
OV-XX



NOTES:

OCS SCHEDULE

POLE No.	POLE TYPE	POLE RAKE (IN/FT)	GUYWIRE NO. 1	GUYWIRE NO. 2	GUYWIRE NO. 3	OVERHEAD NOTES
C1	-	-	-	-	-	
C2	-	-	-	-	-	
C3	-	-	-	-	-	
C4	-	-	-	-	-	
136	731	-	-	-	-	2
167	770	-	-	-	-	2
168	770	-	-	-	-	2
167	770	-	-	-	-	2
186	770	-	-	-	-	2

20' 0 20' 40'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
		REVISIONS			

Transbay Transit Center

DRAWN
CHECKED
DESIGNED
REVIEWED
APPROVED
DATE

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

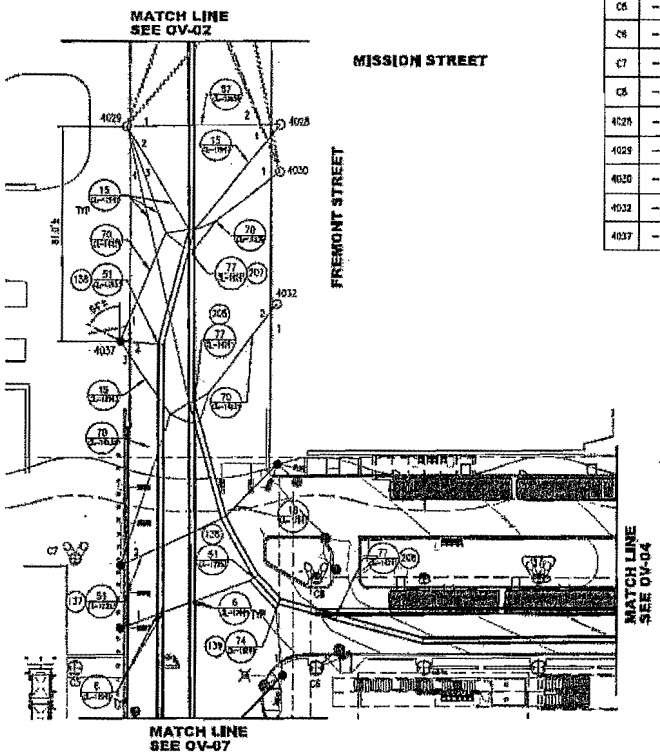
APPROVED
for the EXECUTIVE DIRECTOR / CEO

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE INSTERSECTION LAYOUT

DRAWING 0X-0X-XX-XXX
CL-XXXX
OV-07
OV-XX
REVISION

JOBNUM PRINTED 11/14/08



NOTES:

OCS SCHEDULE						
POLE No.	POLE TYPE	POLE PAINT (M/PT)	SUPPORT NO. 1	SUPPORT NO. 2	SUPPORT NO. 3	OVERHEAD NOTES
C5	–	–	–	–	–	
C6	–	–	–	–	–	
C7	–	–	–	–	–	
C8	–	–	–	–	–	
4028	–	–	–	–	–	1
4029	–	–	–	–	–	1
4030	–	–	–	–	–	1
4032	–	–	–	–	–	1
4037	–	–	–	–	–	2

20' 0 20' 40'
GRAPHIC SCALE

NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
		REVISIONS			

Transbay Transit Center

CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE INTERSECTION LAYOUT

07X-0X-XX-XXX
CL-XXXX
OV-0B
OV-XX

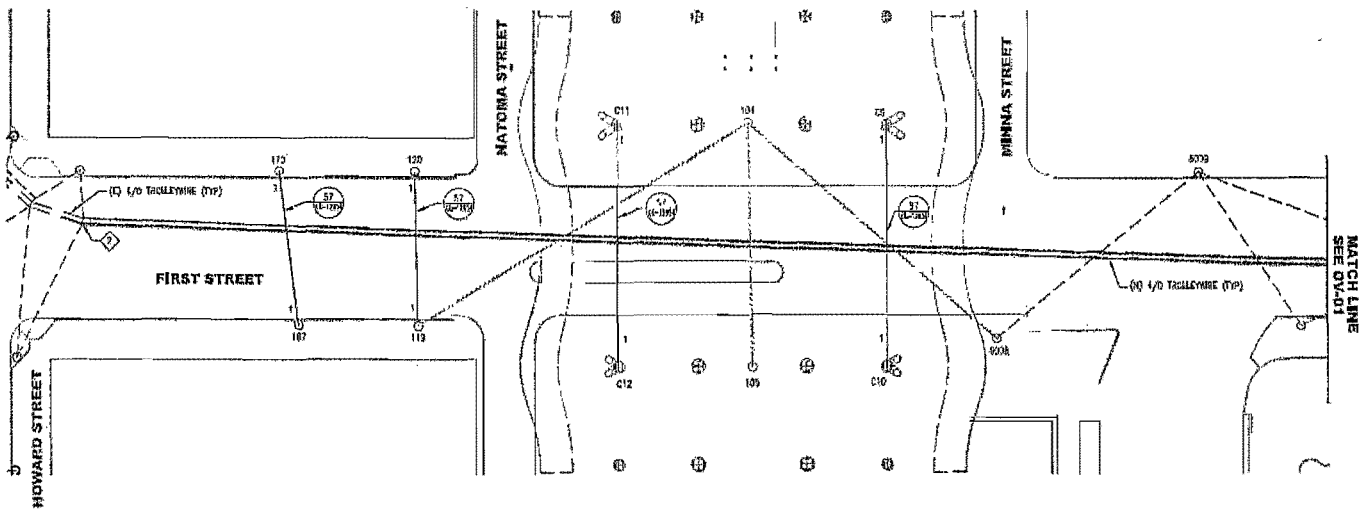
NOTES:

OCS SCHEDULE

POLE No.	POLE TYPE	POLE RAKE (IN/FT)	CONTACT WIRE NO. 1	2	3	OVERHEAD NOTES
C9	–	–	–	–	–	
C10	–	–	–	–	–	
C11	–	–	–	–	–	
C12	–	–	–	–	–	
101	–	–	–	–	–	7 8
105	–	–	–	–	–	7 8

OCS SCHEDULE

POLE No.	POLE TYPE	POLE RAKE (IN/FT)	CONTACT WIRE NO. 1	2	3	OVERHEAD NOTES
119	–	–	–	–	–	1
120	–	–	–	–	–	1
167	–	–	–	–	–	1
170	–	–	–	–	–	1
8009	–	–	–	–	–	1
8009	–	–	–	–	–	1



CITY AND COUNTY OF SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

TROLLEY COACH SYSTEM
TRANSBAY TRANSIT CENTER PROGRAM
NEW TRANSIT CENTER

TROLLEY WIRE AND SPAN PLAN

OV-09

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

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
8214	Parking Control Officer	$27.2875	$17.84	$45.13	0.803	36.24	81.36	650.90
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.

FIRST AMENDMENT TO

INTERGOVERNMENTAL AGREEMENT BETWEEN THE TRANSBAY JOINT POWERS AUTHORITY AND THE SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY

This Amendment is made this 9th day of August, 2010, 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 TJPA have entered into the Agreement (as defined below); and

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

NOW, THEREFORE, 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.

   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" shall include SFMTA Parking Control Officer services for the operations of the Temporary Transbay Terminal during key commute hours.

      Specifically, the required work to be performed by the SFMTA through its Sustainable Streets Division ("SSD") under this Amendment is set forth below:

      Exhibit A-7 Temporary Terminal Operations

      Exhibit B-1 SFMTA/SSD Wage Rates 2010

      Exhibit B-2 SFMTA/MUNI Wage Rates 2009

      Exhibits A-7, B-1 and B-2 are attached to this Amendment Agreement and incorporated by reference as though fully set forth herein.

   b. Section II, "Contract Amount and Terms of Payment", the "Estimated Contract Amount" shall increase to an amount not to exceed $3,280,677.

   c. Section III, "Term; Termination", the "Term" shall extend the Agreement termination to December 15, 2015.

3. Legal Effect. Except as expressly modified by this 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.

TRANSBAY JOINT POWERS AUTHORITY	CITY AND COUNTY OF SAN FRANCISCO
	MUNICIPAL TRANSPORTATION AGENCY
Maria Ayerdi-Kaplan Executive Director	Debra A. Johnson Acting Executive Director/CEO
APPROVED AS TO FORM:	APPROVED AS TO FORM:
Dennis J. Herrera, City Attorney	Dennis J. Herrera, City Attorney
By Sheryl Bregman Deputy City Attorney	By John I. Kennedy Deputy City Attorney
TJPA Board of Directors	SFMTA Board of Directors
Resolution No.	Resolution No. 10-146
Date:	Dated: November 16, 2010
Attest:	Attest:
Secretary, TJPA Board	Secretary, SFMTA Board

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. 10-146

WHEREAS, On June 2, 2009, the SFMTA Board of Directors adopted Resolution No. 09-086 authorizing execution of Contract No. CS-159, Transbay Transit Center Program Services, with the TJPA in the not to exceed amount of $2,282,979 and a term until December 31, 2014; and

WHEREAS, Under this Contract No. CS-159, the TJPA agreed to reimburse the SFMTA for engineering services related to re-routing of Muni's trolley coach service to accommodate the new TJPA temporary bus terminal; and

WHEREAS, The San Francisco Municipal Transportation Agency (SFMTA) and the Transbay Joint Powers Authority (TJPA) have negotiated a First Amendment to Contract No. CS –159, SFMTA Transbay Transit Center Program Services, for Parking Control Officer services during operation of the Temporary Transbay Terminal; and,

WHEREAS, The SFMTA agrees to provide Parking Control Officers (PCOs) during key commute hours to provide efficient and unobstructed transit bus access around the Temporary Transbay Terminal as well as to/from the Bay Bridge; and,

WHEREAS, The TJPA has agreed to increase the contract amount from $2,282,979 to an amount not exceeding $3,280,677 to reimburse the SFMTA for these additional PCO services until December 15, 2015; and,

WHEREAS, The First Amendment to Contract No. CS-159 also extends the contract termination date from December 31, 2014 to December 15, 2015 to ensure completion of the new Transbay Transit Center construction; now, therefore, be it

RESOLVED, That the SFMTA Board of Directors authorizes the Executive Director/CEO to execute the First Amendment to Contract No. CS –159, Transbay Transit Center Program Services, for Parking Control Officer services during operation of the Temporary Transbay Terminal, to increase the contract amount by $997,698 to revised contract amount of $3,280,677, and to extend the contract term to December 15, 2015.

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of NOV 16 2010

R. Boomer

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

ORIGINAL COPY

INTERGOVERNMENTAL AGREEMENT BETWEEN THE TRANSBAY JOINT POWERS AUTHORITY AND THE SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY

This Agreement is made this 21st day of July, 2009, 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

A. The TJPA is a public entity authorized to perform construction of the new Transbay Transit Center Project and Related Structures (the "Project"). The Project involves construction of a Temporary Bus Terminal ("Temporary Terminal) on Howard Street between Beale and Main Streets, demolition of the existing Transbay Terminal ("Existing Terminal") on Mission and First streets, construction of Bus Storage Facility beneath the I-80 Freeway between Second and Fourth streets and relocation of underground utilities ("Utility Relocation").

B. SFMTA is a governmental entity which owns and operates the San Francisco public transit system ("MUNI"), including the Municipal Railway and bus service.

C. To accommodate the Project, it is necessary to provide new routes for MUNI trolley lines and to relocate the SFMTA existing overhead contact system ("OCS") and associated underground utilities. It is also necessary to relocate traffic signals, street striping and parking meters.

D. TJPA and SFMTA wish to provide for the smooth rerouting of MUNI line and associated OCS relocation and will do so by integrating the expertise of SFMTA staff into the Project as provided in this Intergovernmental Agreement.

E. The parties intend that this Agreement will govern the nature of the work to be accomplished, the work eligible for reimbursement, the responsibilities for accomplishing the work, and the responsibilities for payment.

F. The TJPA and the SFMTA acknowledge and agree that this Agreement covers Traffic Engineering, OCS Design, and Construction Management services relating to the Temporary Terminal, demolition of the Existing Terminal, Utility Relocation, Bus Storage Facility and Transit Center work. All other SFMTA work is specifically excluded from these provisions unless expressly provided for in this Agreement. Any future SFMTA services will be addressed in a separate agreement.

AGREEMENT

I. Scope of Services.

Generally, SFMTA will provide the following services under this 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.

D. For construction of the Transit Center, the SFMTA shall provide to the TJPA project management, engineering support services and traffic planning.

E. For construction of the Bus Storage Facility, the SFMTA shall provide to the TJPA traffic engineering services.

Specifically, the required work to be performed by the SFMTA through its MUNI Department and its Department of Parking and Traffic ("DPT") under this Agreement is set forth, as project elements of the Transbay Transit Center Program as follows:

Exhibit A1	Temporary Terminal;
Exhibit A2	Demolition of Existing Terminal;
Exhibit A3	Utility Relocation;
Exhibit A4	New Transit Center;
Exhibit A5	Bus Storage Facility;
Exhibit A6	Miscellaneous Project Management

Exhibits A1 – A6 are attached to this Agreement and incorporated by reference as though fully set forth herein. The SFMTA work shall be referred to as the "SFMTA Transbay Work."

II. Contract Amount and Terms of Payment

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, but shall not become a part of this Agreement until such time as the TJPA approves a modification of Exhibit B, which shall be done as soon as practicable upon SFMTA notification of such rate changes.

B. **Estimated Contract Amount.** In no event shall the total compensation under this Agreement exceed $2,282,979, 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.

C. **Terms of SFMTA Work.** All SFMTA work elements on the Transbay Transit Center Program will be provided on an as-needed time and materials basis. TJPA shall provide SFMTA a detailed milestone schedule in order to facilitate staff scheduling. The Notice to Proceed and SFMTA design deliverables shall be negotiated with TJPA based on the schedule and available SFMTA engineering resources. TJPA will provide two (2) weeks advanced notice of proposed SFMTA construction inspection work for staff scheduling. Work not listed as a Project element is outside the scope of SFMTA services and subject to separate agreement between TJPA and SFMTA.

D. **Terms of TJPA's Contractor Work.** In the event that TJPA's contractor work affects SFMTA revenue operations, traffic signal operations, or safety conditions, TJPA authorizes the SFMTA to take any and all immediate and effective steps, including issuing stop work orders, to ensure that SFMTA revenue operations, traffic signal operations, or safety conditions are maintained.

III. Term; Termination

A. **Term.** This Agreement will commence on the Effective Date and terminate on December 31, 2014, unless extended by the parties or terminated earlier by the parties.

B. **Effective Date.** This Agreement shall become effective when the TJPA's Chief Financial Officer has certified the availability of funds and notifies the SFMTA in writing via a Notice to Proceed (NTP).

C. **Termination.** Either party has the option, in its sole discretion, to terminate this Agreement, at any time, for convenience and without cause. The terminating party shall exercise this option by giving the other party written notice. The notice shall specify the date on which termination will become effective. In the event of a termination, the TJPA shall be responsible for payment of all SFMTA costs incurred on work performed up to the date of termination. SFMTA shall promptly submit a final invoice to the TJPA after any such termination.

IV. Construction Contractor Indemnity

The TJPA shall ensure that any construction contractor shall indemnify, defend and hold harmless the City, the SFMTA, and their employees, officers and agents from any liability or claims arising out of the construction contractor's work.

V. Limitation on Liability; Incidental or Consequential Damages.

A. **General.** Except as otherwise provided in this Agreement, each party to this Agreement shall be responsible for its own damages and other costs, including attorney's fees, as a result of any claims arising out of the acts or omissions of the SFMTA in the performance of the Relocation Work performed in connection with this Agreement.

B. **Liability for Cost Estimates.** The SFMTA shall not be responsible for any additional construction costs exceeding the estimate it provided as part of the SFMTA work. The SFMTA shall cooperate with the TJPA, to the extent feasible, to perform value engineering or re-design in an effort to reduce construction costs on a cost reimbursable basis.

C. **Incidental or Consequential Damages.** Notwithstanding any other provision of this Agreement, in no event shall the TJPA, the City, or the SFMTA be liable, regardless of whether any claim is based on contract or tort, for any special, consequential, indirect or incidental damages, including, but not limited to, lost profits, arising out of or in connection with the SFMTA Traffic Engineering, OCS Design, and Construction Management work.

VI. Miscellaneous Provisions

A. **Notices to the Parties.** Unless otherwise indicated elsewhere in this Agreement, all written communications sent by the parties shall be by U.S. mail, e-mail or fax, and shall be addressed as follows:

To SFMTA: Municipal Transportation Agency
One South Van Ness Ave. 3rd Floor
San Francisco, CA 94103
Attn: James Walsh, Project Manager

with a copy to: Municipal Transportation Agency
One South Van Ness Ave. 7th Floor
San Francisco, CA 94103
Attn: Daniel Arellano, DPT Project Manager

E. Terms of Payment. SFMTA will submit invoices to the TJPA's Executive Director on a monthly basis. The TJPA shall make best efforts to submit all payments to SFMTA within forty-five (45) days from receipt of invoice, addressed to Municipal Transportation Agency, Attention: Chief Financial Officer, One South Van Ness, 8th Floor, San Francisco, CA 94103.

F. Records. The SFMTA agrees to maintain and make available to the TJPA, during regular business hours, accurate books and accounting records relating to its work under this Agreement. The SFMTA will permit TJPA to audit, examine and make excerpts and transcripts from such books and records, and to audit all invoices, materials, payrolls, records or personnel and other data related to all other matters covered by this Agreement, whether funded in whole or in part under this Agreement. The SFMTA shall maintain such records in an accessible location and in satisfactory condition for a period of not less than five (5) years after final payment under this Agreement or until after a final audit has been concluded, whichever is later. The State of California or any governmental agency having an interest in this Agreement shall have the same rights conferred upon TJPA by this Section.

G. SFMTA Use of TJPA Office Space and Equipment. TJPA agrees to provide appropriate field office space and equipment for use by SFMTA construction management staff, including, but not limited to, desks, chairs, work table, lighting, telephone, computer, printer, copy/fax machine, and restroom facilities.

H. Subcontractors. The TJPA acknowledges that the SFMTA may retain subcontractors to assist the SFMTA in the performance of services under this Agreement.

1. The SFMTA shall select all subcontractors through a competitive procurement process in compliance with Federal Transit Administration Circular 4220.1F as set forth in Section 2 of the FTA Regulations.

2. Subcontractors contracting with the SFMTA shall work at the SFMTA's direction, under an agreement with the SFMTA, and subject to FTA Regulations. In the event of a conflict between the FTA Regulations and any term or condition of the contract between the SFMTA and the subcontractor, the provisions of the FTA Regulations shall control.

3. The TJPA shall assume no liability whatsoever for any SFMTA subcontractor. In any contract, agreement, or task order between the SFMTA and a subcontractor for Services, the SFMTA shall require the following:

i. The TJPA shall be recognized as a third-party beneficiary of any such agreement or task order;

ii. The TJPA shall be named as additional insured on any insurance policy provided by a subcontractor covering general and professional liability for the project as set forth in section 6 of this Agreement; and

iii. The subcontractor shall indemnify the TJPA to the fullest extent available under the law.

4. SFMTA may use the services of the City's Department of Public Works ("DPW") in the performance of Services under this Agreement. In such event, DPW shall not be considered a subcontractor and shall not be subject to the requirements of this subparagraph.

To TJPA: Transbay Joint Powers Authority
201 Mission St. Suite 2100
San Francisco, CA 94105
Attn: Maria Ayerdi-Kaplan, Executive Director

B. Tropical Hardwood and Virgin Redwood Ban. Pursuant to section 804(b) of the San Francisco Environment Code, the City and County of San Francisco urges contractors not to import, purchase, obtain, or use for any purpose, any tropical hardwood, tropical hardwood wood product, virgin redwood or virgin redwood wood product.

C. Modification of Agreement. This Agreement may not be modified, nor may compliance with any of its terms be waived, except by written instrument executed and approved in the same manner as this Agreement.

D. Agreement Made in California; Venue. The formation, interpretation and performance of this Agreement shall be governed by the laws of the State of California. Venue for all litigation relative to the formation, interpretation and performance of this Agreement shall be in San Francisco.

E. Construction. All paragraph captions are for reference only and shall not be considered in construing this Agreement.

F. Entire Agreement. This contract sets forth the entire Agreement between the parties, and supersedes all other oral or written provisions. This contract may be modified only as provided in Section VI.C.

G. Severability. Should the application of any provision of this Agreement to any particular facts or circumstances be found by a court of competent jurisdiction to be invalid or unenforceable, then (a) the validity of other provisions of this Agreement shall not be affected or impaired thereby, and (b) such provision shall be enforced to the maximum extent possible so as to effect the intent of the parties and shall be reformed without further action by the parties to the extent necessary to make such provision valid and enforceable.

H. Non-Waiver of Rights. The omission by either party at any time to enforce any default or right reserved to it, or to require performance of any of the terms, covenants, or provisions hereof by the other party at the time designated, shall not be a waiver of any such default or right to which the party is entitled, nor shall it in any way affect the right of the party to enforce such provisions thereafter. There shall be no waiver except in writing, signed by the party to be charged.

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

TRANSBAY JOINT POWERS AUTHORITY	CITY AND COUNTY OF SAN FRANCISCO
	MUNICIPAL TRANSPORTATION AGENCY
Maria Ayerdi-Kaplan Executive Director	Nathaniel P. Ford, Sr. Executive Director/CEO
APPROVED AS TO FORM:	APPROVED AS TO FORM:
Dennis J. Herrera, City Attorney	Dennis J. Herrera, City Attorney
By Sheryl Bregman Deputy City Attorney	By John I. Kennedy Deputy City Attorney
TJPA Board of Directors	SFMTA Board of Directors
Resolution No. 09-018	Resolution No. 09-086
Date: 4/9/09	Dated: 6/2/09
Attest:	Attest:
Secretary, TJPA Board	Secretary, SFMTA Board

EXHIBIT A1

TEMPORARY TERMINAL
PROJECT MANAGEMENT, ENGINEERING SUPPORT, CONSTRUCTION MANAGEMENT, AND SIGNAGE, STRIPING & METER SERVICES BY SFMTA

A. Scope of SFMTA (MUNI) Construction Management, Inspection and Engineering Services:

I. TJPA is constructing a Temporary Transbay Terminal at Howard Street between Beale and Main streets. The SFMTA shall provide construction administration, inspection and engineering support services for the installation of the overhead contact system (OCS) to support the Temporary Transbay Terminal. SFMTA construction staff will work with the TJPA Construction Management-Resident Engineer.

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

- Coordinating and interfacing with project team members including TJPA, TJPA Contractor through TJPA Construction Management, and SFMTA (including SFMTA Resident Engineer, Inspectors, MUNI Maintenance and Operations).
- Assisting TJPA Construction Management-Resident Engineer in coordinating with MUNI Street Operations to request vehicles to test the OCS.
- Assisting TJPA Construction Management-Resident Engineer in submitting Contractor's clearance requests to SFMTA's Operation Central Control (OCC) and attending clearance meetings.
- Calling in and closing out daily OCC clearances.
- Providing inspection services (days, nights, and weekends) for the OCS work.
- Issuing daily inspector reports for the OCS work.
- Providing 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.
- Attending progress, coordination, and traffic management meetings for the OCS work.
- Assisting TJPA Construction Management-Resident Engineer in reviewing OCS submittals and RFIs by providing comments and recommendations.
- Assisting TJPA Construction Management-Resident Engineer in reviewing OCS work progress and Contractor's submitted work plan.
- Assisting TJPA Construction Management-Resident Engineer in processing progress payments by issuing recommendations for OCS quantity measurement and completion.
- Assisting TJPA Construction Management-Resident Engineer in the management of change orders related to OCS work that affects SFMTA's operations.
- Assisting TJPA Construction Management-Resident Engineer in reviewing Contract Change Order Requests and changes related to the OCS.
- Providing SFMTA passengers with advance and timely information regarding changes to bus stops from the Existing Terminal to the Temporary Terminal
- Providing for SFMTA street supervision during planned overhead shutdowns/reroutes and initial test of trains/trolleys as part of OCS construction.

Not to Exceed Budget: $270,500

B. **Scope of SFMTA (DPT) Construction Administration, Engineering and Inspection Services:**

I. SFMTA shall provide engineering and inspection services for the construction of new traffic signals and parking meters, and for the reconfiguration of roadways to support the Temporary Terminal.

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

- Attend regular meetings, coordinate with various agencies and departments to minimize vehicular, pedestrian and transit impacts due to construction.
- Review the traffic routing to accommodate the demolition of the public right-of-way.
- Review the traffic routing needs to accommodate the relocation of utilities adjacent to the Temporary Terminal.
- Review and comment on the traffic routing plans as needed.
- Provide inspection services and recommend operational adjustments to accommodate the reconfiguration of the roadways and traffic controls.
- Provide electrical inspection for traffic signal construction work.

Not to Exceed Budget: **$376,000**

C. **Scope of SFMTA (DPT) Signage, Striping and Parking Meter Relocation Services:**

I. SFMTA shall relocate and install new traffic control signs, remove and relocate all parking meters and furnish and install all final street striping in accordance with the approved Temporary Terminal plans.

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

- Provide all labor and materials necessary to remove existing City owned traffic control signs and guide signs and install new signage in the public right-of-way.
- Provide all labor and materials necessary to remove existing parking meters and install new City-owned parking meters in the public right-of-way.
- Provide all labor and materials necessary to grind existing striping and install final striping for the project.

Not to Exceed Budget: **$612,479**

EXHIBIT A2

EXISTING TERMINAL DEMOLITION
OCS PROJECT MANAGEMENT, ENGINEERING SUPPORT & CONSTRUCTION MANAGEMENT SERVICES BY SFMTA

A. Scope of SFMTA (MUNI) Construction Management, Inspection, and Engineering Services:

I. The TJPA will demolish the existing Transbay Terminal on Mission Street between Fremont and First streets. The SFMTA shall provide engineering and construction management services for the demolition of the existing Transbay Terminal. SFMTA construction staff will work with TJPA Construction Management-Resident Engineer.

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

- Assisting TJPA Construction Management-Resident Engineer in coordinating with MUNI Street Operations to request vehicles to test the OCS project.
- Assisting TJPA Construction Management-Resident Engineer in submitting Contractor's clearance requests to SFMTA's Operation Central Control (OCC) and attending clearance meetings.
- Calling in and closing out daily OCC clearances.
- Providing inspection services (days, nights, and weekends) for the OCS work.
- Issuing daily inspector reports for the OCS work.
- Providing 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 Contractor's work does not negatively impact SFMTA's operations and safety.
- Attending progress, coordination, and traffic management meetings for the OCS project.
- Assisting TJPA Construction Management-Resident Engineer in reviewing OCS submittals and RFIs by providing comments and recommendations.
- Assisting TJPA Construction Management-Resident Engineer in reviewing OCS work progress and Contractor's submitted work plan.
- Assisting TJPA Construction Management-Resident Engineer in processing progress payments by issuing recommendations for OCS quantity measurement and completion.
- Assisting TJPA Construction Management-Resident Engineer in the management of change orders related to OCS work that affects SFMTA's operations.
- Assisting TJPA Construction Management-Resident Engineer in reviewing Contract Change Order Request and changes related to the OCS.
- Providing SFMTA street supervision for vehicle re-routing during planned shutdowns of the OCS system.
- Providing SFMTA passengers with timely information regarding changes to bus line routes and stops during the transition to the temporary terminal.

Not to Exceed Budget: $205,000

B. Scope of SFMTA (DPT) Traffic Engineering Services:

I. SFMTA shall provide engineering and construction management services to support the demolition of the existing Transbay Terminal.

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 during the demolition of the existing Transbay Terminal.
- Review final specifications and estimates for traffic routing for demolition.
- Attend regular meetings and review and comment on traffic routing to accommodate the demolition of the existing Transbay Terminal.

Not to Exceed Budget: $29,000

EXHIBIT A3

UTILITY RELOCATION
TRAFFIC PLANNING AND ENGINEERING SERVICES BY SFMTA

A. **Scope of SFMTA (MUNI) 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 (DPT & MUNI)'s 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)

EXHIBIT A4
TRANSIT CENTER
TRAFFIC PLANNING AND ENGINEERING SERVICES BY SFMTA

5

A. Scope of SFMTA (MUNI)'s 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 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 SMFTA 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.

Not to Exceed Budget: **$480,000**

B. Scope of SFMTA (DPT)'s Traffic Engineering Services: T05

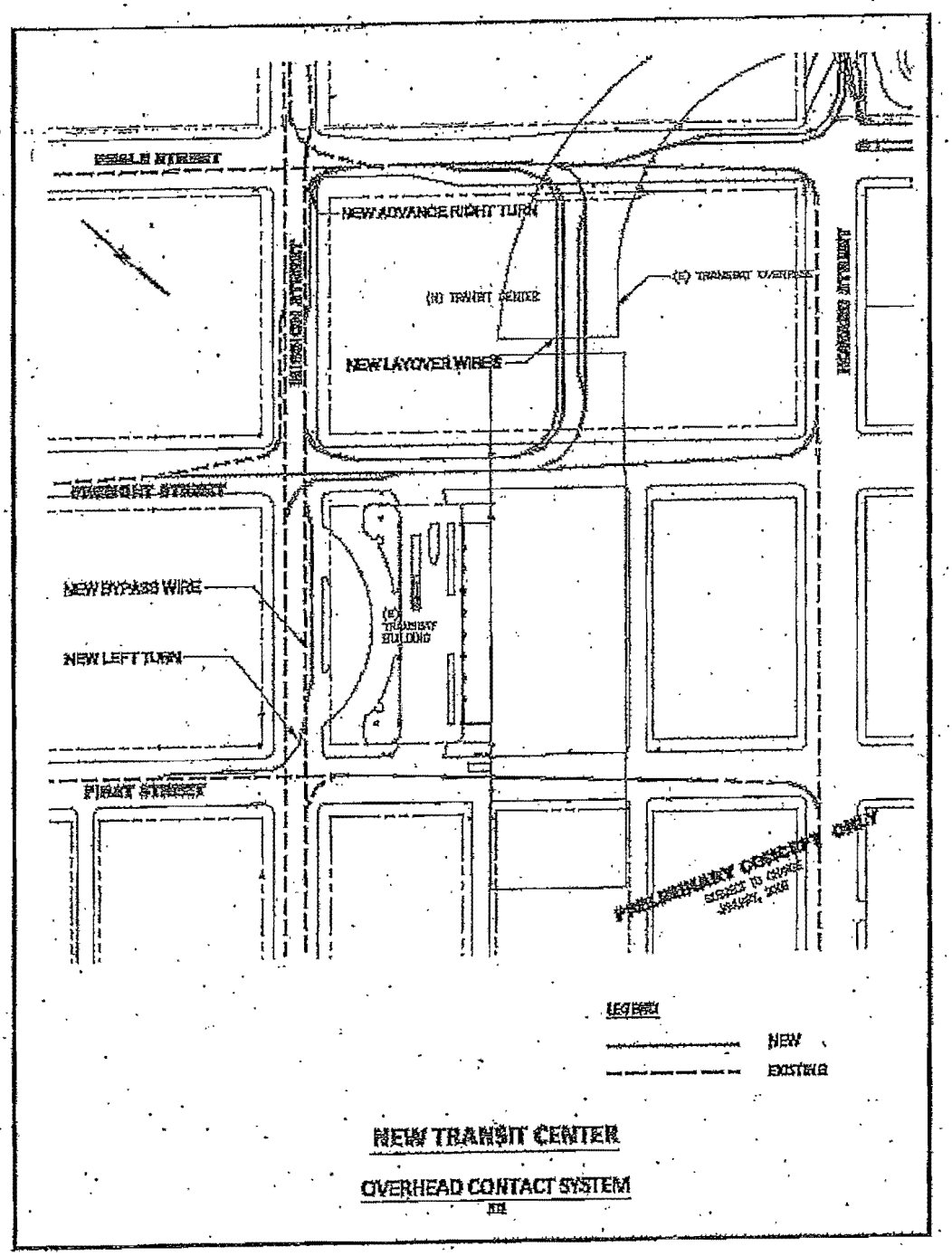
I. SFMTA shall provide traffic planning and engineering services for the new Transit Center.

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**



NEW TRANSIT CENTER

OVERHEAD CONTACT SYSTEM