Union/Patsaouras Plaza Busway Station

Design Build Contract No. C0970

Advanced Conceptual Engineering

VOLUME II OF PROJECT DEFINITION DOCUMENTS - "TECHNICAL DOCUMENTS"

Specifications

Issued for Bid May 7, 2012

Metro

Union/Patsaouras Plaza Busway Station

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Volume II of Project Definition Documents - Technical

SPECIFICATIONS

OUTLINE OF SPECIFICATIONS

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DIVISION 00 – SCOPE OF WORK

00.01 Relationship of Specifications to Other Documents

The Project Definition Documents - “Technical Documents”, provided by Metro are as follows:

Volume I	General Requirements
Volume II	Specifications
Volume III	Preliminary Engineering Drawings
Volume IV	Technical Reports, Mandatory Requirements, and Non-Mandatory Reference Information

Other parts of the Project Definition Documents include:

Form of Contract
Regulatory Requirements
Special Provisions (Design/Build)
General Conditions (Design/Build)
Compensation and Payment Provisions

Requirements that are covered in the General Requirements, on the drawings, or elsewhere in the Technical Documents are not repeated in the Specifications.

Similarly, requirements that are covered in the General Conditions and other parts of the Project Definition Documents are not repeated in the Specifications.

All of the documents taken as a whole describe the Work and the Contractor's obligations.

In the event of any conflict between the Project Definition Documents, refer to Article 1 of the Contract Documents “Form of Contract”. For items where the order of precedence is not defined, the more stringent requirement shall govern.

Division 00, Scope of Work, of the Specifications includes some cross-references to other components of the Project Definition Documents. These cross-references are merely for the reader's information, and do not imply that all relevant information and requirements will be found at the cross-referenced location.

This is a design/build project. These Specifications provide performance requirements and other parameters to guide the design/build Contractor's work. The complete specifications and drawings for construction will be prepared by the design/build Contractor.

00.02 Project Description

The project is briefly described in Section 01010-DB, Summary of Work, in the General Requirements, and is communicated more fully in the Project Definition Documents as a whole. The project includes the Base Bid and two Bid Options. Bid Option 1 eliminates the access lane to eastbound El Monte Busway from Patsaouras Plaza. Bid Option 2 provides a revised ceiling design for the Pedestrian Ramp and Pedestrian Overcrossing structures. Both Options are described more fully in Section 01010-DB, Summary of Work, in the General Requirements.

The "Work" is defined in General Conditions GC-01, Glossary of Terms, and includes design, construction, and documentation.

Contractor's responsibilities are generally described in General Conditions GC-04, Contractor's Obligations. Contractor is solely responsible for delivering all aspects of the project. Provide project management, quality assurance and quality control, third party coordination and approvals, geotechnical and related studies, design, analysis, documentation, construction, supply, fabrication, shipping, expediting, storing materials, installation, erection, debugging, testing, demonstration, and other functions required to deliver an integrated, operable, safe, and reliable project in conformance with the requirements of the Contract.

The General Conditions address the Contractor's obligations to ascertain conditions affecting the Work (General Conditions GC-29 and GC-30), comply with environmental laws and requirements (GC-01 and GC-44), design the project (GC-51), obtain governmental and third party approvals (GC-11 and GC-52), furnish design and construction documents (GC-52), protect existing conditions (GC-26), provide temporary facilities (GC-10), maintain the worksite (GC-16), ensure safety (GC-25), provide good workmanship (GC-17), and dispose of waste (GC-29). These and other obligations and restrictions are addressed more fully in the General Requirements and other Project Definition Documents.

Metro has identified the right of way requirements for the project based on preliminary design (ACE).. Access to the entire project site will be made available to the Contractor when notice to proceed is issued.
Comply with Metro policies for energy, environment, sustainability, and water conservation as described at www.metro.net/projects/metro-environmental . Metro's Bus Rapid Transit (BRT) standards (listed in Specifications 00.04, Standards) also establish sustainability requirements, as does General Requirements Section 01811-DB, Sustainability. Regulatory Requirements RR-2, Recycled Products, establishes a preference for recycled and environmentally sound products.

While this project is not eligible for LEED certification, Contractor is required to comply with LEED 2009 requirements as discussed in General Requirements Section 01811-DB, Sustainability.

The project is subject to Buy America requirements as stated in Regulatory Requirements RR-15, Buy America. Other federal requirements are also stated there.

The Project Definition Documents—"Technical Documents" are preliminary and conceptual, because they represent approximately 30 percent design. However, they are binding on the Contractor except as stated in Specifications 00.05, Mandatory and Non-Mandatory Requirements. General Conditions GC-51 clarifies the role of the Project Definition Documents. Contractor's design shall not impair the essential functions or characteristics of the project, including sustainability, service life, economy of operation, ease of maintenance, desired appearance, and design and safety standards.

For design and construction documents to be approved by Caltrans or other third parties, use design and drafting standards, document formats, and software selections acceptable to Caltrans or other third parties. For other design and construction documents to be approved by Metro, if not included in Caltrans documents, base specifications on Metro's Standard Specifications and follow CSI format (MasterFormat 2004 or 2010); base drawings on Metro's CADD standards; and use standards and software selections acceptable to Metro.

Project milestones are as stated in the Work Completion Schedule, Appendix A to the Special Provisions. The number, nature, and timing of required milestone submittals are addressed in General Conditions GC-52, Contractor-Furnished Documents, and in the General Requirements, particularly Section 00700-DB, Design Management.

The Contractor's obligations during construction are briefly addressed in the General Conditions and spelled out more fully in the General Requirements (Volume I of the Project Definition Documents—Technical Documents).

Construction work for this project must not include pile driving, blasting, or other activities that could cause movement or vibration of existing improvements. Protect existing structures, including below grade foundations and other improvements, from damage or stress. Also prevent construction noise impacts to users of existing facilities, including Patsaouras Plaza, Union Station, the Gateway Building, the El Monte Busway, and the US 101 Freeway.

Construction phasing is addressed in Volume III, Preliminary Engineering Drawings. The number of existing traffic lanes on the El Monte Busway in each direction must not be reduced throughout the work, under Metro BRT Design Criteria and Caltrans standards. Safe pedestrian access, including disabled access, must also be maintained to at-grade facilities. Contractor's use of the site is severely restricted by these requirements and ongoing operations. Prepare a phasing and staging plan as required in Specifications 00.06, Project Management and Coordination. Comply with City of Los Angeles phasing/staging standards.

The work includes excavation, handling, and storage of contaminated and hazardous soils and pile drilling mud, as addressed in General Requirements 01564-DB, Environmental

Safety and Health Program. The work also includes pumping, temporary storage, sampling and testing, and offsite transport and disposal of contaminated or hazardous groundwater, as addressed in General Requirements 01564-DB, Environmental Safety and Health Program, and General Requirements 01566-DB, Pollution Controls. Hazardous materials are addressed in General Conditions GC-30, Differing Site Conditions, and in Special Provisions SP-38, Hazardous Substances.

At conclusion of work, in addition to other closeout requirements, restore temporary easement areas to preconstruction conditions. Restore grades and replace improvements and features in kind, except for alterations required for the project and approved in writing by Metro. Upgrade from preexisting conditions when required by easement agreements.

00.03 Specifications Terminology

Specifications are addressed to the Contractor. The Specifications other than Division 00 are written in a brief, streamlined, outline style. Verbs are generally omitted. If something is mentioned, it is required, unless otherwise noted.

"Elements" identified in the Specifications are only the major project components to be provided by the Contractor. Provide all required components, appurtenances, accessories, and work required for a properly constructed and functioning project, whether or not listed in the Specifications or shown in Volume III, Preliminary Engineering Drawings.

"Standards" listed in the Specifications are not all-inclusive. Compliance with the listed standards is required, but other standards may apply. Also, a listed standard may in turn reference other standards; those must be complied with as well. Comply with applicable standards whether listed or not.

"Performance and other requirements" in the Specifications are not all-inclusive. They state some specific Metro requirements that govern the Contractor's design choices and execution of the work, but do not represent all of the requirements applicable under governing codes and standards and common industry practice.

"Quality assurance and quality control" requirements in the Specifications are not all-inclusive. They identify some specific items that Metro requires, but do not represent all of the quality requirements binding on the Contractor. Comply with applicable requirements of codes and standards and with project-specific plans for quality assurance and control. See General Requirements Section 01460-DB, Project Quality Program Requirements, for Metro's general quality requirements. Assume that enhanced commissioning of all major aspects of the project will be required.

"Submittals" identified in the Specifications are in addition to requirements stated in the General Conditions, Special Provisions, General Requirements, Preliminary Engineering Drawings, and standards applicable to the project. When references to other agencies in a standard are interpreted to mean Metro under General Conditions GC-02, Interpretation, make submittals required under that standard to Metro. When submittals to other agencies are required, submit full copies to Metro concurrently. (Note: Sustainability submittals will be identified by the Contractor and listed in the final specifications for the project.)

Other Specifications terminology:

- "Including" means "including but not limited to." Lists are not all-inclusive.
- The word "all" is omitted; if an object or activity is mentioned, the statement refers to all of that object or activity.
- The singular includes the plural and vice versa. Identifying an item in the singular does not mean that only one of that item is required.
- Unless specifically designated to be furnished only or installed only, work is to be provided (i.e., both furnished and installed) by the Contractor.

00.04 Standards

"Standards" as used in the Specifications includes codes, regulations, industry standards, and other generally accepted requirements. Standards referred to in the Specifications are "Reference Codes" and "Reference Standards" as defined in General Conditions GC-01, Glossary of Terms, and are binding on the Contractor. However, references to entities and documents, measurement and payment provisions, and other provisions as necessary are changed as appropriate for Metro, as stated in General Conditions GC-02, Interpretation.

Comply with applicable standards whether or not identified in this section or elsewhere in the Specifications, as stated in General Conditions GC-02, Interpretation.

Comply with the latest versions of applicable standards (including updates, errata, supplements, amendments, etc.) in effect at the time of bid solicitation, as stated in General Conditions GC-02, Interpretation, unless governing code requires adherence to an earlier version.

If government requirements (codes or permit conditions) change before final acceptance, comply with new versions as stated in General Conditions GC-11, Governmental Approvals. If other standards change, comply with new versions issued before completion of 65% design, as stated in Metro BRT Design Criteria 2.1. Note in particular that Caltrans specifications and SSPs are amended monthly, and that a new edition of the Caltrans Standard Specifications may be released in 2011. Also note that Metro may update and augment its Standard Specifications, and this project will have to comply with new or modified requirements as applicable.

Conflicts in documents and standards are addressed in General Conditions GC-02, Interpretation. In case of conflict between standards, the more stringent requirements apply.

While all of the standards listed here or noted elsewhere in the Specifications govern the project, some may overrule others depending upon the type and location of specific work. For example, all work in Caltrans right of way must comply with Caltrans standards, including the Caltrans Standard Specifications and Caltrans Construction Manual, as well as with the project design documents. Verify which standards apply in each case, subject to Metro and Caltrans concurrence.

Web links to standards are provided for convenience only. Contractor is responsible for identifying, locating, and obtaining applicable standards.

(continued on next page)

To avoid repetition, some standards are referred to in the Specifications by a brief shorthand heading, such as "California codes" or "Caltrans standards." These terms indicate the following:

A. California codes

1. Title 24 of the California Code of Regulations, available through www.bsc.ca.gov/default.htm

    a. Part 1, California Building Standards Administrative Code
    b. Part 2, California Building Code
    c. Part 3, California Electrical Code
    d. Part 4, California Mechanical Code
    e. Part 5, California Plumbing Code
    f. Part 6, California Energy Code
    g. Part 9, California Fire Code
    h. Part 11, California Green Building Standards Code
    i. Part 12, California Reference Standards Code

2. Supplements and errata to Title 24, available at www.iccsafe.org/cs/codes/pages/errata.aspx

3. California Energy Commission requirements

    a. Building standards, available at www.energy.ca.gov/title24/2008standards/

        1) California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (CBEES) (Part 6 of Title 24)
        2) Reference Appendices
        3) Nonresidential Compliance Manual
        4) Supporting forms and documents

    b. Appliance standards, available at www.energy.ca.gov/appliances/

        1) Appliance Efficiency Regulations
        2) Appliance Efficiency Database

4. Cal/OSHA requirements

    a. Title 8 of the California Code of Regulations, Division 1, Department of Industrial Relations, Chapter 4, Division of Industrial Safety (Cal/OSHA), safety orders, available at www.dir.ca.gov/samples/search/query.htm

1) Construction Safety Orders
2) Electrical Safety Orders
3) Elevator Safety Orders
4) Telecommunication Safety Orders
5) Other as applicable

b. Permit and other requirements, summarized at www.dir.ca.gov/dosh/RegPermitRegCertNotificatio.htm#ConstructionActivities
c. Other Title 8 requirements, available at
www.dir.ca.gov/dosh
www.dir.ca.gov/samples/search/query.htm
www.oal.ca.gov/CCR.htm

5. California State Fire Marshal (SFM) requirements

a. Title 19 of the California Code of Regulations, Public Safety, Section 1, State Fire Marshal, available through www.oal.ca.gov/CCR.htm
b. Laws, code interpretations, bulletins, and other guidance available at osfm.fire.ca.gov/programs/lawsregs.php
c. Licensing and listing requirements available at osfm.fire.ca.gov/strucfireengineer/strucfireengineer.php
d. Other requirements available through osfm.fire.ca.gov/index.php

B. Metro BRT (Bus Rapid Transit) standards

1. BRT Design Criteria
2. BRT Architectural Standard Drawings
3. BRT Supplemental Sustainability Design Criteria (SSDC) Guideline
4. Freeway Supplemental Sustainability Design Criteria

C. Caltrans standards

1. Specifications, available at dot.ca.gov/hq/esc/structurespecs/donspecs/

a. 2006 Standard Specifications (English)
c. 2006 Standard Special Provisions - SSPs (English)
d. 2006 Structure Reference Specifications (English)

2. Amendments to 2006 Standard Specifications, available at dot.ca.gov/hq/esc/oe/specifications/SSPs/2006-SSPs/Sec_01-03/ in file "S1-020H"
3. Standard Plans, available at dot.ca.gov/hq/esc/oe/standards.php
4. Division of Engineering Services technical publications, available at dot.ca.gov/hq/esc/techpubs/

a. Engineering Services Manuals, including bridge, structural, and seismic design publications
b. Construction publications
c. Design publications
d. Office Engineer publications
e. Right of Way and Land Surveys publication
f. Traffic operations publications
g. Other publications as applicable

5. Other manuals, available at dot.ca.gov/manuals.htm
6. Stormwater quality and related requirements, available at dot.ca.gov/hq/construc/stormwater/manuals.htm
7. Other Caltrans requirements, available at dot.ca.gov
8. Project Study Report/Project Report for this project as approved

D. Accessibility standards

1. U.S. Access Board's Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines for Buildings and Facilities (ADAAG), including updates; available at www.access-board.gov/ada/2. U.S. Department of Transportation's ADA Standards for Transportation Facilities (ADA-DOT), based on ADAAG; available at www.access-board.gov/ada/
3. California Building Code (CBC), available at www.bsc.ca.gov/default.htm
4. California Department of General Services, Division of the State Architect (DSA) California Access Compliance Reference Manual, available at www.dgs.ca.gov/dsa/Programs/progAccess/accessmanual.aspx
5. California Disabled Accessibility Guidebook (CalDAG), available at www.caldag.com
6. Others as listed in Metro's Regulatory Requirements RR-20

E. Metro rail standards (applicable only when specifically cited)

1. Metro Rail Transit Design Criteria and Standards

a. Standard Specifications
b. Standard and Directive Drawings
c. Metro Rail Design Criteria

F. Metro signage standards

1. Metro Graphic Standards
2. Materials and Fabrication Standards
3. Metro Liner

G. Metro safety standards

1. Construction Safety and Health Manual (CSHM)

H. Metro environmental standards

1. Policy GEN 51, Construction and Demolition Debris Recycling and Reuse Policy
2. Energy and Sustainability Policy
3. Sustainability Implementation Plan
4. (Also see Metro BRT standards)

I. SSPWC

1. Public Works Standards Inc., www.greenbookspecs.org/Publications.html

   a. Standard Specifications for Public Works Construction ("Greenbook")
   b. Standard Plans for Public Works Construction

2. City of Los Angeles

   a. Additions and Amendments to the Standard Specifications for Public Works Construction ("Brown Book"), available at eng.lacity.org/techdocs/stdplans/s-600/S61028.pdf

J. City of Los Angeles, www.lacity.org/index.htm

1. Codes and requirements as applicable, including city-adopted versions of California codes and the SSPWC
2. Los Angeles Fire Department requirements
3. Standard Plans
4. Standards for work phasing and staging

K. County of Los Angeles, lacounty.gov

1. Codes and requirements as applicable

L. SCAQMD, South Coast Air Quality Management District

1. Rules and regulations, available at www.aqmd.gov/rules/index.html

   a. Rule 403, Fugitive Dust
   b. Rule 1110.2, Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines
   c. Rule 1113, Architectural Coatings
   d. Rule 1120, Asphalt Pavement Heaters

e. Rule 1168, Adhesive and Sealant Applications
f. Rule 1186, PM_{10} Emissions from Paved and Unpaved Roads, and Livestock Operations
g. Others as applicable

00.05 Mandatory Requirements and Non-Mandatory Information

The Project Definition Documents—Technical contain some provisions that are mandatory requirements and other material that is non-mandatory reference information. "Mandatory" means binding on the design/build Contractor. "Non-mandatory" means not binding on the design/build Contractor.

Mandatory requirements are essential project requirements that reflect prior commitments and determinations by Metro. The Contractor must comply with mandatory requirements unless specifically waived in advance in writing by Metro.

Non-mandatory information includes preliminary technical studies and preliminary design solutions for various aspects of the project, as well as other material that provides background information. Non-mandatory information is provided for the Contractor's convenience. Metro does not warrant or guarantee its completeness, accuracy, acceptability, or compliance with Contract requirements. Conduct project-specific studies, analysis, and design as necessary to ascertain conditions and requirements affecting the Work.

Volumes I and II of the Project Definition Documents—Technical are mandatory. This includes the General Requirements and the Specifications.

Volume III of the Project Definition Documents—Technical (Preliminary Engineering Drawings) contains both mandatory requirements and non-mandatory information.

Similarly, Volume IV (Technical Reports, Mandatory Requirements, and Non-Mandatory Reference Information) is partly mandatory and partly for reference only.

Appendix A to these Specifications identifies which items in the Project Definition Documents—Technical are mandatory and which are non-mandatory.

If the Project Definition Documents—Technical do not indicate something that is required under Metro standards, or indicate something less stringent than required under Metro standards, comply with Metro standards, unless specifically indicated as non-mandatory in Appendix A or unless waived in writing by Metro under a Change Order.

00.06 Project Management and Administration

Provide:

- Compliance with approved project schedule
- Project management and administration, including scheduling, cost control, reporting, material expediting, and quality assurance
- Fixed facility, operating system, and other design, engineering, and analysis
- Construction and installation management and supervision
- Preparation, management, and execution of the integrated quality assurance program
- Preparation, management, and execution of the construction safety and security program
- System test and verification, and performance of all required reviews, inspections, tests, and demonstrations required for verification and acceptance of the system
- Project documentation, including preparation, delivery, and correction, as necessary, of all deliverable data in both electronic and hard copy data forms, as specified in the Contract Documents, including as-built drawings and specifications
- Provision of bonds, insurance, permits/licenses, guarantees, and warranties as required by the Contract Documents
- Work required under guarantees and warranties as required by the Contract Documents
- Maintenance, servicing, and repairs of all facilities and equipment until final acceptance by Metro. Maintain records of preventive and corrective maintenance performed and make this information available to Metro for review upon request
- Other project management and administration activities required to satisfy the provisions of the Contract, including delivering specified quantities of spare parts

Provide and implement a Project Quality Program in accordance with Section 01460-DB, Project Quality Program Requirements, of the General Requirements. The project quality program must apply to all phases of the Contract.

Prepare and submit for approval by Metro a phasing and staging plan describing and illustrating how the work will be phased and staged. Include proposed plans for construction phasing/order of work, traffic staging, and work staging. Submit within 20 days after Notice to Proceed. Coordinate approval by Metro, Caltrans, and the City of Los Angeles.

Develop, implement, and monitor a graffiti abatement plan. Submit the plan within 60 days from Notice to Proceed for approval by Metro and Caltrans.

Develop a Schedule of Values for each of the elements of work identified in the Contract Documents in accordance with Section 01371-DB, Schedule of Values, of the General Requirements.

Comply with other requirements given in the General Requirements, General Conditions, and other portions of the Contract Documents, including Construction Work Plans under General Requirements 01460-DB, Project Quality Program Requirements.

00.07 Interface with Third Parties

A. Public agencies and utilities

Fully coordinate with, and obtain necessary permits and approvals from, public agencies and utilities, including:

Caltrans
City of Los Angeles
County of Los Angeles
South Coast Air Quality Management District (SCAQMD)
Regional Water Quality Control Board, Los Angeles Region (RWQCB)
Public and private utilities
California Environmental Protection Agency (Cal/EPA) and its member agencies
Southern California Regional Rail Authority (SCRRA) (operators of Metrolink)
Union Pacific Railroad (UPRR)
Amtrak

Caltrans encroachment permit(s) will be required for Contractor, in addition to encroachment permit(s) issued to Metro.

Prepare comprehensive technical descriptions and plans of each facility and utility to identify possible third-party improvements and conflicts; submit for Metro review and approval. Assist in preparing or amending agreements with affected organizations.

The Contractor shall be responsible for costs and delays associated with redesign or reconstruction as a result of Contractor's failure to fully coordinate with utilities and other third parties; failure to provide adequate notices, scope, designs, and schedule; or failure to comply with the Project Definition Documents.

Coordinate with jurisdictional agencies to address or mitigate concerns regarding:

- Traffic management
- Temporary road closures
- Temporary utility interruptions
- Temporary construction such as falsework
- Construction staging
- Noise
- Air quality
- Dust control
- Haul routes
- Night work
- Peak hour exemptions

The Contractor shall contract directly with the California Highway Patrol (CHP) in order to hire CHP officers and vehicles to patrol project construction zones. Generally, Caltrans utilizes the Construction Zone Enhancement Enforcement Program (COZEEP) for all traffic restrictions outlined in the Caltrans Construction Manual. The Contractor shall modify (as required) the current COZEEP Agreement (contract) developed by Caltrans to contract with CHP. The Contractor shall obtain the approval of Metro and Caltrans before executing the agreement with CHP.

The Contractor should use CHP officers to increase traffic enforcement above normal levels in situations where traffic problems are anticipated, to reduce the potential for traffic accidents within a construction zone, and to reduce traffic speeds to the posted speed limits. CHP Officers may be used to slow down or assist in stopping or directing traffic to enable necessary breaks in traffic for critical movements of the Contractor's equipment and operations. During the erection or removal of bridge falsework over traffic lanes, or when traffic will be switched onto a detoured route are examples of when CHP Officers may be used to help control traffic. Other traffic restrictions required are identified in the Caltrans Construction Manual.

The contractor shall work closely with Metro and Caltrans to make an assessment of the need for CHP assistance for traffic control during all phases of construction. The Metro has estimated the funds required for the CHP services on this project and an allowance has been included in the bid schedule.

For temporary road closures if applicable, coordinate and obtain approvals from LADOT, LABOE, LABSS, LABSL, LABCA, LABOS, Board of Public Works, LAPD, LAFD, and Caltrans.

B. Special arrangements with City, County, and State

In lieu of issuing permits normally required for work in City of Los Angeles rights of way, the City's Board of Public Works has approved a Special Permitting Process (SPP) for Work indicated in the Project Definition Documents, Contract Drawings, and Contract Specifications. Metro has also entered into Master Cooperative Agreements (MCAs) with Los Angeles County and the State. Project work is covered under Article 3 of each MCA.

The SPP relieves the Contractor from the obligation to pay permit fees and from certain other requirements. However, the SPP does not relieve the Contractor from obligations for obtaining plan check approvals, paying plan check fees, obtaining permits, complying with permit requirements, obtaining inspections and approvals, and paying related fees charged by any City agency or department.

The MCAs are provided in Volume IV of the Project Definition Documents—Technical. Contractor assumes both the benefits and the obligations of the SPP and MCAs to the extent necessary to implement this Contract.

C. Community relations

Metro Community Relations will conduct the overall community relations program for the project. Contractor shall:

- Defer to Metro Community Relations to coordinate construction activities with private parties

- Not communicate with the public or media, or otherwise communicate or distribute any information about the project, without Metro's prior written consent

00.08 Metro's Responsibilities

Although Metro will carry out certain responsibilities, the Contractor has primary responsibility for coordination with Metro and other entities, in accordance with General Conditions GC-15, Cooperation, Coordination and Access. Prepare and maintain a master schedule including work by Contractor, Metro, and other entities, for the information of all parties. Update the schedule each month and submit it with monthly project status reports.

Metro will:

A. Provide preconstruction right of way exhibits indicating existing property lines and right of way requirements based on preliminary design.

B. Provide preconstruction Record of Survey.

C. Provide the horizontal and vertical survey control established by Metro which has been used in the development of base mapping and forms the basis of the preliminary horizontal and vertical geometry

- Survey control points are included in Volume IV of the Project Definition Documents
- Metro does not warrant or guarantee the completeness, accuracy, or acceptability of this work

D. Furnish designs, specifications, and other available information pertaining to work separately contracted by Metro for this project

E. Furnish pertinent outputs from previously completed design efforts, including design specifications and drawings, environmental impact analyses, geotechnical reports, and cooperative agreements with other agencies

F. In the future (not a part of this Contract and not concurrent with it), furnish and install Universal Fare System equipment, which may include Ticket Vending Machines (TVM), Stand Alone Validators (SAV), Universal Fare System gates, and related components and hardware

G. Furnish artwork for installation by Contractor, and manage artists' participation in the project

H. Assist in the Contractor's coordination and liaison with local, regional, state, and federal agencies, as specified in Master Cooperative Agreements and Special Permits executed between Metro and other agencies

I. Monitor implementation of Contractor's Project Quality Program

J. Provide vehicles, dispatch, and operators for Contractor's tests and demonstrations required for verification and acceptance of communication systems

00.09 Abbreviations and Acronyms

ADAAG	U.S. Access Board's Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines for Buildings and Facilities	www.access-board.gov/ada/
ADA-DOT	ADA Standards for Transportation Facilities, as adopted by DOT	www.access-board.gov/ada/
ASTM	ASTM International (formerly American Society for Testing and Materials)	www.astm.org/standards
Cal/OSHA	California Department of Industrial Relations, Division of Occupational Safety and Health	www.dir.ca.gov/dosh
Caltrans	California Department of Transportation	dot.ca.gov
CCR	California Code of Regulations	www.oal.ca.gov/ccr.htm
CFR	Code of Federal Regulations	www.gpoaccess.gov/cfr/index.html
CSI	Construction Specifications Institute	csinet.org
DOC	U.S. Department of Commerce	gsi.nist.gov/global/index.cfm/L1-1/loc-gsig
DOT	U.S. Department of Transportation	www.dot.gov
EPA	U.S. Environmental Protection Agency	www.epa.gov/lawsregs
FM	FM Global (formerly Factory Mutual)	www.fmglobal.com
FS	Federal Specification	apps.fas.gsa.gov/pub/fedspecs/search.cfm
NFPA	National Fire Protection Association	www.nfpa.org/aboutthecodes/list_of_codes_and_standards.asp

NPDES	National Pollutant Discharge Elimination System	www.swrcb.ca.gov/water_issues/programs/npdes
OSHA	U.S. Department of Labor, Occupational Safety and Health Administration	www.osha.gov
OSHA	Occupational Safety and Health Act	www.osha.gov/comp-links.html
SCAQMD	South Coast Air Quality Management District	www.aqmd.gov
SSPWC	Standard Specifications for Public Works Construction	www.greenbookspecs.org/Publications.html
UL	Underwriters Laboratories	ulstandardsinfonet.ul.com/scopes

00.10 Division 00 Submittal Summary

Following is a summary of items to be submitted which are called for in Division 00, Scope of Work. This is not a complete list of submittals. Additional submittals are required in other sections of the Specifications as well as in the General Requirements and General Conditions.

From	Item
00.02	Milestone submittals, per Work Completion Schedule (Appendix A to the Special Provisions) and General Requirements Section 00700-DB, Design Management
00.02	Other design and construction submittals, per General Conditions GC-52, Contractor-Furnished Documents, General Requirements Section 01300-DB, Submittals, and other sections
00.06	Project Quality Program
00.06	Graffiti abatement plan; submit within 60 days of Notice to Proceed
00.06	Schedule of Values
00.06	Phasing and staging plan; submit within 20 days of Notice to Proceed
00.07	Technical descriptions and plans to identify third-party effects and conflicts
00.07	General summary of project status and 8-week lookahead for major activities, with specific line tasks associated with public/private agencies; submit monthly
00.07	Formal complaint and resolution process; submit before construction starts
00.07	Complaint tracking log; submit monthly
00.08	Master schedule including work by Contractor, Metro, and other entities; update and submit each month

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DIVISION 10 – SURVEY AND SITE PREPARATION

10.01 Photography

A. Elements

1. Digital still photography
2. Digital video photography

B. Standards

1. Digital files of photographs

   a. JPEG format
   b. Resolution 300 dpi or greater

2. Digital video photography

   a. Format: As approved by Metro

C. Performance and other requirements

1. Take preconstruction color photographs and digital video recordings of existing conditions:

   a. At the Metro right of way property line and for 100 feet on each side of the Metro right of way
   b. At affected parcels and City, County, and State facilities
   c. At temporary easements

2. In photos and video recordings, clearly illustrate preexisting conditions and include features that may be disturbed during construction
3. During construction, provide at least 10 photos monthly depicting construction activities

D. Quality assurance and quality control

1. Work of professional photographer

E. Submittals

1. Submit 14 days before start of construction

   a. Digital files of photographs on CD

      1) Identify CD case or envelope with Contract name and number, photograph dates and numbers, name of Contractor, and name of professional photographer

b. Three sets of 8" x 10" color prints, mounted back-to-back in double-sided 8-1/2" x 11" sheet protectors punched to fit standard 3-ring binders

c. Provide identification label, 1-1/2" x 3-1/2", in lower right corner on back of each photograph, indicating:

    1) LAMTA or Metro
    2) Contract no.
    3) Description
    4) Photography date
    5) Photograph number
    6) Contractor

d. Digital video recording(s) on CD or DVD

e. Include key map showing photography locations

f. Clearly identify the location and date of each photograph, digital file, and video segment

    1) In electronic file names
    2) On prints
    3) Within video

2. Submit progress photos monthly with pay applications

    a. Digital files, 8" x 10" prints, and key map
    b. Comply with submittal requirements for preconstruction photography

10.02 Survey

A. Elements

1. Survey
2. Mapping
3. Monumentation
4. Plats and legal descriptions
5. Filing with authorities having jurisdiction

B. Standards

1. General Conditions GC-19, Survey and Verifications
2. Metro BRT Design Criteria

    a. 3.6, Right-of-Way

3. Caltrans standards, including

    a. Division of Right of Way and Land Surveys publications, available at www.dot.ca.gov/hq/row and www.dot.ca.gov/hq/row/landsurveys/

        1) Right of Way Manual
        2) Surveys Manual
        3) Plans Preparation Manual, Section 4

    b. Office of Photogrammetry standards, available through www.dot.ca.gov/hq/esc/photogrammetry/
    c. Other pertinent reference materials and examples available from Caltrans

4. California codes
5. Federal Geodetic Control Committee, "Standards and Specifications for Geodetic Control Networks," September 1984
6. California Board for Professional Engineers and Land Surveyors

    a. Laws and regulations, available at www.pels.ca.gov/licensees/laws.shtml

C. Performance and other requirements

1. Basis for horizontal and vertical controls

    a. North American Datum (NAD) 1983 Horizontal, 2007.0 Epoch
    b. National GeodeticVertical Datum (NGVD), 1929 Vertical

2. Accuracy of horizontal ground control and of supporting ground surveys

    a. Horizontal: Not less than second-order, class I
    b. Vertical: Not less than third-order, class I

3. Protect existing monuments, including benchmarks, corner ties, nail and tins, right of way corners, boundary monuments, brass disks, etc.
4. Establish and set the Survey Control for the design and construction of the project
5. Aerial photography and phogrammetric mapping must comply with Caltrans standards
6. Locate street centerlines and right of way lines, Metro and Caltrans right of way lines, and other cadastral lines whose locations are necessary for the project, based on land survey boundary control methods and procedures under the responsible charge of a land surveyor licensed in the state of California

    a. Acquire, at Contractor's expense, research material required and necessary to locate street centerlines and right of way lines, Metro and Caltrans right of way lines, and other cadastral lines whose locations are necessary for the project
    b. Determine locations for all such lines including all project horizontal control required to construct the Work

7. Set monuments for Caltrans right of way
8. Replace destroyed monuments and document new monuments
9. Prepare and file a post-construction Record of Survey
10, The Contractor shall update the right of way requirements based on the final design and obtain approvals from Metro, Caltrans, and the City of Los Angeles. The Contractor shall prepare Legal Descriptions and Plats for impacted parcels.

D. Quality assurance and quality control

1. Work performed, sealed, and signed by a California-licensed land surveying firm experienced in Caltrans construction projects and Caltrans right of way projects
2. Surveyor's person in responsible charge approved by Metro before start of work
3. Coordinate requirements with Metro and Caltrans before start of work

E. Submittals

1. Resume and copy of license of surveyor's person in responsible charge, 10 working days before survey begins
2. Survey control map

3. Survey records (copies)
4. Plats and legal descriptions
5. Caltrans right of way maps
6. Post-construction Record of Survey indicating items such as right of way monumentation set, right of way monumentation replaced, and centerline ties and monuments

7. Submit to Caltrans all:

    a. Right of way maps (Land-Net maps, record maps)
    b. Records of Survey
    c. Copies of survey documents including original field notes, adjustment calculations, final results, and appropriate intermediate documents
    d. Aerial mapping information and materials listed in the Caltrans document "Materials Needed to Review Consultant Photogrammetric Mapping"

10.03 Selective Demolition

A. Elements

1. Sitework at plaza, where indicated on Contract Drawings

    a. Remove and salvage granite curb
    b. Remove and salvage brick pavers; remove bedding sand
    c. Remove concrete pavement, etc.
    d. Remove other hardscape
    e. Remove and salvage traffic signal equipment, signal poles, and signal heads
    f. Remove and salvage light standards and lights
    g. Limit disturbance of existing plaza improvements to minimum necessary for the Work
    h. If granite curb or brick paver improvements are removed or damaged, replace with identical materials and installation under specific requirements given in Specifications 40.02, Plaza Pavement/ Masonry

2. Architectural structures at plaza level

    a. Remove portion of arcade (portal structure)

3. Improvements on El Monte Busway, US 101 Freeway, and US 101 on/off ramps at Vignes Street

    a. Remove portion of bridge superstructure
    b. Remove pavement, curbs, etc.
    c. Remove portion of raised island
    d. Remove retaining wall and concrete barrier
    e. Remove and salvage light standards and lights
    f. Remove and salvage overhead cantilevered sign structure
    g. Remove and salvage traffic poles and signal heads
    h. Remove broken grates/frames at drainage facilities
    i. Remove storm drains and abandon in place where indicated
    j. Removal and reconstruction of AC/AB
    k. Removal of portions of CIDH retaining wall (Bents 6 & 7)
    l. For storm drains to be removed, relocated, and reinstalled, see Specifications 30.05, Site Drainage
    m. For reinstallation of salvaged items where indicated, see Division 40, Site Improvements

4. Other as indicated or as required for the Work
5. For utility work at plaza level see Specifications Division 30, Site Utilities
6. For tree removal see Specifications 20.03, Clearing and Grubbing

B. Standards

1. California codes

   a. Including Cal/OSHA, Construction Safety Orders, Article 31, Demolition, available at www.dir.ca.gov/Title8/sb4a31.html

2. Caltrans standards
3. City of Los Angeles

C. Performance and other requirements

1. Protect improvements and vegetation to remain
2. Maintain traffic, access, and utilities without interruption
3. Prevent damage to items to be salvaged
4. Mark limits of removal; sawcut neatly
5. Remove, load/unload, transport, store, and protect items to be salvaged
6. Demolish, remove, and recycle or dispose of improvements to be selectively demolished
7. Conduct work so as to maximize opportunities for material recycling or reuse

D. Quality assurance and quality control

1. Prepare selective demolition plans for Metro and Caltrans review and approval

   a. Methods, procedures, equipment, and structures to be used
   b. Safety measures including signs, barriers, and temporary walkways
   c. Haul routes, recycling facilities, and disposal sites
   d. Structural survey required under Cal/OSHA
   e. Permits and authorizations required

2. Obtain required permits before starting demolition work

E. Submittals

1. Selective demolition plans

10.04 Clearing and Grubbing

A. Elements

1. Clear and grub trees, stumps, undergrowth, brush, trash, grass, weeds, roots, rubbish, refuse, or other debris within the limits of Work
2. Include removal of debris in existing drainage facilities where indicated
3. Remove and dispose of waste

B. Standards

1. City of Los Angeles, Native Tree Protection Ordinance and related code sections, available from the City and at www.ci.la.ca.us/boss/UrbanForestryDivision/index_INTROLAnativetree.htm
2. Caltrans standards

C. Performance and other requirements

1. Protect improvements and plantings to remain in place, including tree species protected by City ordinance (coast live oak, California sycamore)
2. If protected trees are removed, comply with City ordinance for tree removal (permits required)
3. Remove trees completely, including stumps and roots
4. Remove other vegetation and roots to depth required

    a. Excavation, embankment, and borrow areas: 6 inches below ground surface
    b. Other areas: level with ground surface
    c. Comply with Caltrans requirements if more stringent

5. Leave surface smooth and level

    a. No depressions or drainage impediments

D. Quality assurance and quality control

1. Prepare clearing and grubbing plan for Metro and Caltrans approval

E. Submittals

1. Clearing and grubbing plan

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DIVISION 20 – EARTHWORK

20.01 Earth Moving

A. Elements

1. Excavate, including trenches
2. Import and export
3. Place backfill
4. Grade
5. Perform compaction
6. Construct embankments
7. Conduct testing
8. Control erosion and sedimentation (temporarily)
9. For dewatering see Specifications 20.02, Dewatering

B. Standards

1. Caltrans standards

    a. Including stormwater quality manuals and handbooks available at dot.ca.gov/hq/construc/stormwater/manuals.htm

2. City of Los Angeles

    a. Including SSPWC and City's "Brown Book"
    b. Building Code Chapter 70 “Grading, Excavation, and Fills”
    c. Including Department of Public Works, Bureau of Sanitation, Stormwater Program, www.lacitysan.org/wpd/index1.htm

3. California codes
4. SCAQMD

    a. Including Rule 403, Fugitive Dust
    b. Including Rule 1186, PM_{10} Emissions from Paved and Unpaved Roads, and Livestock Operations

C. Performance and other requirements

1. Protect property, conditions, and structures to remain
2. Protect engineering instrumentation, slope indicators, and staking
3. Deal with hazardous soils and contaminated soils before beginning excavation or rough grading

    a. Handle under General Conditions GC-30, Special Provisions SP-38, and General Requirements 01564-DB, Environmental Safety and Health Program
    b. Do not commingle with other materials

4. Identify and handle unsuitable materials under Caltrans standards and California codes
5. Perform all:

    a. Excavation, regardless of material character and subsurface condition
    b. Export, except see above for hazardous soils and contaminated soils
    c. Import
    d. Backfill placement
    e. Compaction
    f. Grading
    g. Embankment construction
    h. Erosion and sedimentation control

6. Do not conduct blasting, driving, hammering, or other construction methods that would subject existing improvements to impact or vibration
7. Achieve required compaction

    a. As recommended by Contractor's project-specific geotechnical reports
    b. Meet Caltrans compaction requirements if stricter

8. Control temporary erosion and sedimentation

    a. Comply with referenced standards

D. Quality assurance and quality control

1. Provide materials, testing, and inspection required under Caltrans standards, California codes, and other referenced standards
2. Use testing agency acceptable to Metro and Caltrans and qualified under ASTM E329 and ASTM D3740

E. Submittals

1. Testing agency qualifications
2. Product data for manufactured materials if used
3. Samples of manufactured materials if used
4. Material test reports for each onsite and borrow material proposed for fill and backfill

    a. Soil classification
    b. Laboratory compaction curve

5. Test reports and other submittals per Caltrans and City standards

6. Haul route approval
7. SWPPP (Storm Water Pollution Prevention Plan)
8. SUSMP (Standard Urban Stormwater Mitigation Plan) and/or other requirements of City of Los Angeles as applicable

20.02 Dewatering

A. Elements

1. Dewatering associated with pile drilling and pile construction
2. Dewatering associated with other subgrade work as applicable
3. Treatment and disposal of contaminated or hazardous water and soil

B. Standards

1. Caltrans standards

    a. Including stormwater quality and related requirements, available at dot.ca.gov/hq/construc/stormwater/manuals.htm

        1) Caltrans Construction Site BMP Manual
        2) Updated NS-2 Dewatering Operations BMP Fact Sheet
        3) Field Guide for Construction Dewatering

2. RWQCB, California Regional Water Quality Control Board, Los Angeles Region, www.waterboards.ca.gov/losangeles/

    a. Applicable permits, orders, plans, policies, laws, and regulations
    b. Verify current status of permits relevant to Metro, Caltrans, and project location

3. SWRCB, State Water Resources Control Board, http://www.waterboards.ca.gov/

    a. Applicable permits, orders, plans, policies, laws, and regulations
    b. Verify current status of permits relevant to Metro, Caltrans, and project location

4. DTSC, California Department of Toxic Substances Control, www.dtsc.ca.gov/

    a. Applicable permits, orders, plans, policies, laws, and regulations

5. As listed under General Conditions GC-01, Glossary of Terms, for "Environmental Laws" and "Hazardous Substances"

C. Performance and other requirements

1. Comply with referenced standards

2. Handle contaminated or hazardous groundwater under General Conditions GC-30, Special Provisions SP-38, and General Requirements 01566-DB, Pollution Controls

    a. Pump and store in tank
    b. Obtain testing and profiling by certified laboratory
    c. Engage certified waste hauler for offsite disposal

3. Handle contaminated or hazardous soil and drilling mud under General Conditions GC-30, Special Provisions SP-38, and General Requirements 01564-DB, Environmental Health and Safety Program

    a. Excavate and stockpile soils
    b. Pump and store drill mud
    c. Protect until tested and removed by others

D. Quality assurance and quality control

1. Comply with referenced standards

E. Submittals

1. Comply with referenced standards

20.03 Excavation Support and Protection

A. Elements

1. Excavation support and protection
2. Shoring and underpinning

B. Standards

1. California codes
2. Caltrans standards
3. OSHA
4. Cal/OSHA

    a. Including Construction Safety Orders

5. City of Los Angeles

C. Performance and other requirements

1. Provide facilities and measures required under referenced standards or necessary for safe prosecution of the Work

D. Quality assurance and quality control

1. Designs and calculations prepared, sealed, and signed by a California registered civil or structural engineer

E. Submittals

1. Working drawings
2. Plans and calculations
3. Contingency plan to address caving

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DIVISION 30 – SITE UTILITIES

30.01 Site Utilities, General

A. Elements

1. Site utilities of all ownerships, including public, private, cooperative, municipal, and governmental

2. Facilities and systems for carriage, transmission, or distribution of:

a. Electric power
b. Television
c. Telephone
d. Telegraph
e. Fiber optic lines
f. Water
g. Gas
h. Oil
i. Petroleum products
j. Steam
k. Chemicals
l. Sewage
m. Industrial waste
n. Storm water
o. Drainage
p. Traffic signals
q. Street lights
r. Any similar commodity

B. Standards

1. Under applicable sections of Division 30

C. Performance and other requirements

1. Locate and identify all utilities potentially affected by the Work
2. Protect in place existing utilities by:

a. Staking utility locations
b. Avoiding utility locations with construction equipment
c. Installing steel plating
d. Installing concrete slabs
e. Encasing in concrete
f. Temporarily de-energizing power lines
g. Installing physical barriers
h. Other work as necessary to avoid damaging utilities

3. Remove and relocate utilities where shown or as required
4. Rearrange utilities as required

    a. Alter, replace, reconstruct, support, or remove conflicting utility improvements to accommodate the Work

5. Abandon utilities where indicated
6. Construct utilities as required

    a. Include appurtenances such as manholes, valve cans or boxes, and vaults

7. Perform incidental utility work as required

    a. Provide conduits, connections, valves, and other items necessary
    b. Adjust manholes, valve cans or boxes, and vaults to finish grade
    c. Reconstruct surface improvements such as sidewalks, curbs, gutters, pavement, and striping

8. Keep Metro informed

    a. Within 3 days after sending or receiving correspondence to or from utility owners, furnish copies to Metro and to other entities as requested by Metro
    b. Keep Metro informed of developments in utility-related work and ongoing coordination with utility owners, either by written reports or by coordination meetings, as appropriate

        1) Within 5 business days after meetings, furnish minutes to Metro and to meeting attendees

    c. Within 30 days after Notice to Proceed, furnish copies to Metro of communications formally addressing all long-lead utility items

D. Quality assurance and quality control

1. Under applicable sections of Division 30

E. Submittals

1. Under applicable sections of Division 30
2. Utility matrix covering all utilities and services
3. Copies of notices, correspondence, and meeting minutes
4. Contingency plan to cover breakage of or damage to an existing utility

30.02 Site Water, Domestic

A. Elements

1. Locate existing onsite water lines and provide extensions from existing onsite water lines
2. Meter if required
3. For domestic water improvements at buildings and other structures, see Specifications 70.02, Structure Water, Domestic

B. Standards

1. Metro BRT Design Criteria

    a. 3.5, Utilities

2. California codes
3. Caltrans standards
4. City of Los Angeles
5. SSPWC
6. Metro rail standards – Standard Specifications

    a. 02600, Piped Utilities

7. NSF International (formerly National Sanitation Foundation), www.nsf.org

    a. NSF 61, Drinking Water System Components—Health Effects

C. Performance and other requirements

1. Provide corrosion control appropriate to conditions and design life

    a. Soils are believed to be mildly to moderately corrosive
    b. Comply with Metro BRT Design Criteria 3.5.14, Corrosion Control

2. Provide copper piping downstream of meter

    a. ASTM B88, Type K underground
    b. ASTM B88, Type L aboveground
    c. Components complying with applicable ASME, ASTM, NSF, and AWWA standards

D. Quality assurance and quality control

1. Per SSPWC
2. Materials certified and marked under NSF 61

3. Comply with City standards for materials, installation, testing, and disinfection

E. Submittals

1. Per City of Los Angeles and SSPWC
2. Product data
3. Shop drawings if applicable
4. Coordination drawings
5. Test reports
6. Operation and maintenance data for valves and specialties

30.03 Site Water, Fire Protection

A. Elements

1. Fire water lines
2. Fire hydrant(s)
3. Fire pumps, storage, etc., if required
4. For fire protection at buildings and other structures, see Specifications 70.03, Structure Water, Fire Protection

B. Standards

1. Metro BRT Design Criteria

    a. 3.5, Utilities

2. City of Los Angeles

    a. Los Angeles Fire Department (LAFD)

3. California codes
4. Caltrans standards
5. NFPA, National Fire Protection Association, www.nfpa.org/aboutthecodes/list_of_codes_and_standards.asp

    a. NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances
    b. Others as applicable

6. Metro rail standards – Standard Specifications

    a. 02600, Piped Utilities

C. Performance and other requirements

1. General

    a. Comply with utility's requirements

2. Provide corrosion control appropriate to conditions and design life

    a. Soils are believed to be mildly to moderately corrosive
    b. Comply with Metro BRT Design Criteria 3.5.14, Corrosion Control

3. Fire hydrant(s)

    a. Locate within distance required by code and LAFD
    b. Verify and comply with LAFD requirements
    c. Not more than 300 feet from platform, per BRT Design Criteria

4. Fire pumps, storage, etc.

    a. As required by City of Los Angeles and applicable standards

D. Quality assurance and quality control

1. Per SSPWC and City of Los Angeles
2. UL or FM listing for materials
3. Components complying with applicable ASME, ASTM, and AWWA standards

E. Submittals

1. Per SSPWC and City of Los Angeles
2. Product data
3. Shop drawings
4. Materials list
5. Test and inspection reports

30.04 Site Sewer

A. Elements

1. Remove, relocate, and reinstall existing sewer improvements affected by the Work

    a. As indicated on Preliminary Engineering Drawings
    b. Other improvements as identified by Contractor

2. Project does not include plumbing fixtures or other items requiring connection to sewer

B. Standards

1. Metro BRT Design Criteria

    a. 3.5, Utilities

2. California codes
3. City of Los Angeles
4. SSPWC
5. Caltrans standards
6. Metro rail standards – Standard Specifications

    a. 02600, Piped Utilities

C. Performance and other requirements

1. Per SSPWC and City of Los Angeles
2. Determine exact location and nature of improvements before starting work; repair any damage caused
3. Use City approved materials and suppliers
4. Install under SSPWC 306 unless otherwise required
5. Ensure that excavations:

    a. Are dry immediately before and after installation
    b. Provide sound surfaces/structures able to support materials
    c. Have concealed surfaces finished before installation

6. Perform backfill compaction using non-jetting methods

D. Quality assurance and quality control

1. Closed circuit television (CCTV) testing, pre- and post-construction, under SSPWC 500-1.1.4 and 500-1.1.5

2. Leakage testing under SSPWC 306-1.4, witnessed by Metro and City inspector

E. Submittals

1. Per City of Los Angeles and SSPWC
2. Design drawings and specifications

    a. Indicate as-built or latest plan numbers
    b. Indicate utility ownership
    c. Approved by City of Los Angeles Department of Public Works, Bureau of Engineering

3. Spill Prevention Plan
4. Spill Response Plan
5. Sewer Bypass Plan
6. Product data
7. Test and inspection reports

30.05 Site Drainage

A. Elements

1. Confirm locations of all existing storm drains
2. Remove and replace any drainage improvements at plaza level that are damaged during the Work
3. For drainage improvements for El Monte Busway and US 101 Freeway, see Specifications 40.01, Roadway and Related Utility Improvements
4. For drainage improvements at buildings and other structures, see Specifications 70.04, Structure Drainage

B. Standards

1. California codes
2. Caltrans standards
3. Metro BRT Design Criteria

    a. 3.5, Utilities
    b. 3.11, Drainage

4. RWQCB, California Regional Water Quality Control Board, Los Angeles Region, www.waterboards.ca.gov/losangeles/

    a. Applicable permits, orders, plans, policies, laws, and regulations
    b. Verify current status of permits

5. SWRCB, State Water Resources Control Board, http://www.waterboards.ca.gov/

    a. Applicable permits, orders, plans, policies, laws, and regulations
    b. Verify current status of permits

6. City of Los Angeles

    a. Department of Public Works, Bureau of Sanitation, Stormwater Program, www.lacitysan.org/wpd/index1.htm

7. Metro rail standards – Standard Specifications

    a. 02600, Piped Utilities

C. Performance and other requirements

1. Provide appropriate drainage facilities for brick paver unit pavement and other plaza work

2. Match existing grades
3. Provide gratings of special design typical of Metro installations
4. Connect discharges to storm drainage system as required

D. Quality assurance and quality control

1. Per Caltrans standards and City of Los Angeles

E. Submittals

1. Per Caltrans standards and City of Los Angeles
2. Drainage calculations
3. Drainage details
4. Product data
5. Permits and approvals – submit 10 days before construction

30.06 Site Electrical

A. Elements

1. Extension from existing onsite service at Union Station

    a. Conduit
    b. Wiring

2. For electrical improvements at buildings and other structures, see Specifications 70.06, Structure Electrical
3. For lighting see Specifications 30.07, Site Lighting

B. Standards

1. California codes

    a. California Electrical Code
    b. Cal/OSHA

        1) Electrical Safety Orders
        2) Construction Safety Orders

2. City of Los Angeles
3. Metro BRT Design Criteria

    a. Section 7, Electrical
    b. 3.5.14, Erosion Control

4 NFPA, National Fire Protection Association

    a. NFPA 70, National Electrical Code

C. Performance and other requirements

1. Metro rail standards – Standard Specifications

    a. 16050, Basic Electrical Materials and Methods

D. Quality assurance and quality control

1. UL listing

E. Submittals

1. Product data for conduit, fittings, wiring, connectors, and other materials

30.07 Site Lighting

A. Elements

1. Remove, relocate, and reinstall freestanding exterior lighting at plaza
2. For roadway lighting see Specifications 40.01, Roadway and Related Utility Improvements
2. For lighting at buildings and other structures, see Specifications 70.07, Structure Lighting

B. Standards

1. California codes

    a. California Electrical Code
    b. Cal/OSHA

        1) Electrical Safety Orders
        2) Construction Safety Orders

2. City of Los Angeles
3. Metro BRT Design Criteria

    a. Section 7, Electrical
    b. 3.5.14, Erosion Control

4 NFPA, National Fire Protection Association

    a. NFPA 70, National Electrical Code

C. Performance and other requirements

1. Industry standard materials and workmanship
2. Use new connectors, etc.

D. Quality assurance and quality control

1. UL listing

E. Submittals

1. Product data for new lamping

30.08 Site Communications

A. Elements

1. Extension from Union Station communications room

    a. Conduit
    b. Fiberoptic cable (voice, video, and data)
    c. Integrated system supporting all communications and security

        1) Passenger assistance telephone (P-tel)
        2) Emergency telephone (E-tel)
        3) Public pay telephone
        4) Public address system (PA)
        5) Variable message signs (VMS)
        6) Closed circuit television (CCTV)
        7) Future Universal Fare System (UFS) components

    d. Uninterruptible power supply (UPS)

2. For communications improvements at buildings and other structures (telephone, PA, variable message signs), see Specifications 70.08, Structure Communications
3. For CCTV see Specifications 70.10, Structure Security
4. For future UFS equipment see Specifications 80.04, Universal Fare System (UFS) Provisions

B. Standards

1. California codes

    a. California Electrical Code
    b. Cal/OSHA

        1) Electrical Safety Orders
        2) Communication Safety Orders
        3) Construction Safety Orders

2. City of Los Angeles
3. Metro BRT Design Criteria

    a. Section 9, Systems
    b. 3.5.14, Corrosion Control

4 NFPA, National Fire Protection Association

a. NFPA 70, National Electrical Code

C. Performance and other requirements

1. Minimize impacts on Metro operations

a. Coordinate access to active systems through Metro
b. Install without disrupting Metro operations and activities
c. Obtain Metro approval before modifying existing systems

2. Provide equipment, terminals, hardware, enclosures, transmission media, interconnecting cables, power connections, and appurtenances required for a complete and functional system integrated with Metro's existing system
3. Materials and equipment

a. Standard products of recognized manufacturers
b. Most current, state-of-the-art design
c. Metro approval required if not like existing

4. Comply with manufacturers' installation instructions without deviation
5. Provide 3-hour-rated firestopping at openings for conduit or cable
6. Conceal conduit and cable unless approved by Metro during design

D. Quality assurance and quality control

1. Comply with EIA, IEEE, NEMA, NFPA, and UL standards
2. Testing

a. Use testing equipment certified by nationally recognized laboratory

E. Submittals

1. Product data, including installation instructions
2. Work plans for any modifications to existing systems and equipment
3. Design drawings
4. Installation, Modification, and Construction Plan
5. Acceptance Test Plan and procedures for interim and final acceptance testing
6. Testing equipment calibration certificates

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DIVISION 40 – SITE IMPROVEMENTS

40.01 Roadway and Related Utility Improvements

A. Elements

1. Road work at El Monte Busway/US 101 Freeway

    a. Base and pavement
    b. Curb, gutter, etc. as required
    c. Reconstruct center island (partially demolished under Specifications 10.03, Selective Demolition)
    d. Concrete barriers
    e. Crash cushions
    f. Traffic signing, striping, and pavement markings
    g. For underlying structure see Specifications Division 50, Civil Structures

2. Storm drainage

    a. Deck drains
    b. Area drains
    c. Catch basins
    d. Storm drains
    e. Replace broken grates/frames at existing drainage facilities
    f. Remove, relocate, and reinstall existing storm drains
    g. Conveyance to and discharge at grade for drainage from above-grade structures

        1) Connect to storm drainage system as required

    h. Stormwater treatment facilities

        1) Austin sand filter system proposed in Storm Water Data Report (PA/ED Submittal); subject to Caltrans approval
        2) Provide facilities required per agency approvals

    i. Additional or alternative drainage work as necessary

3. Miscellaneous hot mix asphalt
4. Reinstall salvaged light standard and fixture, or replace with new if existing light does not meet current standards
5. For overhead cantilevered sign structure see Specifications 40.05, Overhead Signs (Freestanding)
6. Other as shown or as required for the Work

B. Standards

1. Caltrans standards
2. Metro BRT Design Criteria

    a. 3.7, Control of Access
    b. 3.8, Busway
    c. 3.11, Drainage

3. SSPWC
4. City of Los Angeles DOT specifications and standards

C. Performance and other requirements

1. Base and pavement

    a. Comply with Caltrans standards and design approval
    b. Coordinate for required vertical alignment of pedestrian platform slab with busway pavement elevation and bus door opening operations; critical design parameter subject to Metro approval

2. Signing, striping, and pavement markings

    a. California MUTCD (Manual of Uniform Traffic Control Devices), available at dot.ca.gov/hq/traffops/signtech/mutcdsupp/index.htm

D. Quality assurance and quality control

1. Per Caltrans standards and SSPWC

E. Submittals

1. Per Caltrans standards and SSPWC

40.02 Plaza Pavement/Masonry

A. Elements

1. Reinstall removed and salvaged granite curbs and brick pavers
2. Replace with new materials, and install to match existing, any of the following plaza improvements to remain that are damaged during the Work

    a. Brick paver system in pedestrian areas
    b. Brick paver system in bus driveway
    c, Granite curbs
    d. Concrete paving

B. Standards

1. California codes
2. Accessibility standards
3. ICPI, Interlocking Concrete Pavement Institute, icpi.org

    a. Specific standards and guidelines as recommended by Technical Director of ICPI for project-specific conditions

4. ASTM, www.astm.org/standards

    a. Granite curbstone

        1) ASTM C615, Specification for Granite Dimension Stone
        2) ASTM C1528, Standard Guide for Selection of Dimension Stone for Exterior Use
        3) ASTM C1353, Standard Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform, Double-Head Abraser
        4) ASTM C170, Standard Test Method for Compressive Strength of Dimension Stone
        5) ASTM C1271, Standard Guide for Petrographic Examination of Dimension Stone
        6) ASTM C97, Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone

    b. Mortar

        1) ASTM C91, Standard Specification for Masonry Cement
        2) ASTM C270, Standard Specification for Mortar for Unit Masonry
        3) ASTM C778, Specification for Standard Sand

C. Performance and other requirements

1. Brick paver system

a. Pavers identical to existing

1) Product of Blockleys Brick Ltd., Michelmersh group, www.michelmersh.co.uk/home
2) Nibbed chamfered clay paviors, 210 x 105 x 65 mm
3) Color series: Match existing
4) Include manufacturer's suggested accessories
5) No substitutions will be considered for work in plaza

b. Layout, colors, and color pattern identical to existing conceptual scheme in plaza; see Volume III, Preliminary Engineering Drawings

c. Stable, firm, and slip resistant per accessibility standards

1) Coefficient of friction (wet), ASTM C1028, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

d. Installation:

1) Develop installation system based on ICPI standards for Metro approval

a) Obtain project-specific recommendations from Technical Director of ICPI (David R. Smith, dsmith@icpi.org, 703-657-6887)

2) Design to vehicular standards (including in pedestrian areas) suitable for buses and fire trucks
3) Design for drainage per applicable codes

2. Granite curbs

a. Comply with ASTM C1528

b. Match existing curbstone

1) Shape and dimensions
2) Color and pattern
3) Finishes (sawn, split face, split ends, rough sawn, smooth/thermal, flamed, bush hammered, etc., as applicable)

c. Granite and mortar complying with referenced standards

d. Granite material

1) Free from seams or flaws that impair its structural integrity
2) Of smooth splitting and machining character
3) Of uniform color
4) Free from drill marks or other artificial blemishes
5) Minimum compressive strength 19,000 psi, ASTM C170
6) Maximum water absorption 0.40%, ASTM C97
7) Minimum density 160 lb/ft^3, ASTM C97

e. Granite cutting

1) Cut in lengths between 10 and 20 feet
2) Make top even and smooth for full length of stone
3) Make squared joints that abut adjoining sections with no crack or joint exceeding 1/2 inch in width
4) Cut circular curbs conforming accurately to required radius
5) Cut ends of circular curbs radially so that joints will not exceed 1/2 inch in width
6) Keep thickness within 1/4 inch tolerance

f. Stable, firm, and slip resistant per accessibility standards

1) Coefficient of friction (wet), ASTM C1028, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

g. Installation

1) Design installation system, which may include stainless steel anchors, mortar, and mortar pointing of joints, for Metro approval
2) Employ experienced stonemasons to conduct workmanlike field trimming and fitting of curbstones and closure pieces
3) Top of installed curb must not vary more than 1/4 inch in 5 feet
4) Clean off excess mortar and prevent discoloration of granite

3. Concrete paving

a. Stable, firm, and slip resistant per accessibility standards

1) Coefficient of friction (wet), ASTM C1028, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

b. Meet Caltrans requirements for miscellaneous concrete

D. Quality assurance and quality control

1. Brick paver system

    a. System design
    b. Mock-ups

2. Granite curb

    a. Verify field measurements before granite is cut
    b. Prepare shop drawings showing:

        1) Geometrical sections
        2) Finishes for each face (top, face, ends, and back)
        3) Tolerances for each face
        4) Site locations with radii and degree of radii and approximate lengths
        5) Anchoring details and locations

    c. Test for percent wear under AASHTO T 96
    d. Mock-ups

3. Concrete paving

    a. Per referenced standards

E. Submittals

1. Product data
2. Shop drawings
3. Samples
4. Qualifications of field granite cutter and installer
5. Material certificates, test reports
6. Mix designs for mortar and grout
7. Compressive strength of masonry/mortar
8. ICPI design recommendations
9. Detailed design for paver installation including drainage
10. Detailed design for granite curbing

40.03 Landscaping and Irrigation

A. Elements

1. Remove and replace existing irrigation components and systems at plaza damaged by partial demolition or other Work
2. Replace landscaping in disturbed landscaped areas
3. Provide new landscaping and irrigation as required for the Work

B. Standards

1. Metro rail standards – Standard Specifications

    a. 02820, Irrigation Systems – Design/Build
    b. 02950, Landscape Planting
    c. 02951, Landscape Maintenance and Plant Establishment

C. Performance and other requirements

1. Per referenced standards
2. Plantings, irrigation, and design visually and functionally consistent with existing Patsaouras Plaza treatments
3. Plans to be approved by Metro

D. Quality assurance and quality control

1. Per referenced standards

E. Submittals

1. Per referenced standards

40.04 Fencing

A. Elements

1. At emergency egress stairs

a. High security heavy duty chain link enclosure
b. High security heavy duty chain link gates, including walk-through for disabled
c. Panic hardware at gates

B. Standards

1. ASTM

a. ASTM F2611, Standard Guide for Design and Construction of Chain Link Security Fencing
b. ASTM F1712, Standard Specification for Steel Chain-Link Fencing Materials Used for High Security Applications
c. ASTM F1083, Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

2. California codes
3. Accessibility standards

C. Performance and other requirements

1. General

a. ASTM F2611 security fencing
b. Standard chain link fencing products and design are not acceptable

2. Materials

a. Pipe:

1) High strength 83000 Schedule 40 pipe, ASTM F1083
2) Hot dip galvanized
3) With clear organic coating or colored polymer powder coat as determined by Metro, coating and color to be approved
4) Fittings in same finish

b. Mesh

1) High security, ASTM F1712
2) Hot dip galvanized after weaving

3) With dark colored PVC polymer coating to improve visibility through fencing if required by Metro, color to be approved
4) Fittings in same finish

c. Other: ASTM F2611

3. Security hardware

a. Panic hardware at gates (gates swing outward only)
b. Prevent opening of gates from outer side of gates
c. Comply with accessibility standards

4. Egress/access

a. Provide minimum two pedestrian egress gates plus walk-through for disabled egress
b. Prevent entry into stairway from grade level – stairs are for emergency egress only, not access
c. Design fence to prevent climbing

D. Quality assurance and quality control

1. Standard of quality: Products of AMICO (Alabama Metal Industries Corporation) or equal

E. Submittals

1. Product data
2. Manufacturer's certification of compliance with referenced ASTM standards
3. Finish specifications and color selections
4. Samples
5. Shop drawings

40.05 Overhead Signs (Freestanding)

A. Elements

1. Install new freestanding overhead sign standard and signs
2. Furnish and install new signs on existing sign standard

B. Standards

1. Caltrans standards

C. Performance and other requirements

1. Caltrans standards

D. Quality assurance and quality control

1. Per Caltrans standards

E. Submittals

1. Per Caltrans standards

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DIVISION 50 – CIVIL STRUCTURES

50.01 Civil Structures and Canopy Foundations

A. Elements

1. Project elements

   a. Busway bridge widening
   b. Pedestrian walkway structure
   c. Pedestrian ramp / overcrossing structure (which includes elevator platform)
   d. Below-deck columns and foundations for canopy on bus platform

2. Structural components

   a. Cast-in-drilled-hole piles
   b. Grade beam over Red Line tunnel
   c. Footings to straddle existing CIDH retaining wall (Bents 6 & 7)
   d. Spread footings and other foundation work
   e. Columns
   f. Bridge superstructure
   g. Deck drains as required
   h. Barriers, etc.
   i. Other as shown or as required for the Work

3. For dewatering see Specifications 20.02, Dewatering

B. Standards

1. Caltrans standards

   a. Including Seismic Design Criteria (SDC), v. 1.4 June 2006, available at dot.ca.gov/hq/esc/techpubs/
   b. Including bridge design requirements and guidance available at dot.ca.gov/hq/esc/techpubs/
   c. Including Standard Specifications and amendments

2. AASHTO, American Association of State Highway and Transportation Officials

   a. AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications, 4th edition, with 2009 interims, or later version with interims if accepted by Caltrans, available at https://bookstore.transportation.org/category_item.aspx?id=BR
   b. California Amendments to the AASHTO LRFD Bridge Design Specifications (Fourth Edition), December 2008, available at dot.ca.gov/hq/esc/techpubs/

3. AWS, American Welding Society, www.awspubs.com/

   a. AWS D1.1, Structural Welding Code—Steel
   b. AWS D1.4, Structural Welding Code—Reinforcing Steel
   c. AWS D1.5, Bridge Welding Code

4. Metro BRT Design Criteria
5. Accessibility standards
6. Metro rail standards

   a. Metro Rail Design Criteria, Section 5, Structural/Geotechnical, with Section 5 Appendix, Metro Supplemental Seismic Design Criteria
   b. Standard Specifications 09860, Anti-Graffiti Coating

C. Performance and other requirements

1. Phasing/order of work

   a. Develop phasing/order of work for construction, traffic, and staging under Specifications 00.06, Project Management and Administration, for approval by Caltrans, Metro, and the City of Los Angeles.

      1) All El Monte Busway lanes must remain open at all times and shoulder closure will not be permitted except as noted in this paragraph. The El Monte Busway lanes may be completely closed only on one occasion (occurrence) during the transition from Traffic Handling Stage 2 to Stage 3 between the hours 10:00PM at night to 06:00AM the following morning. Contractor shall coordinate with Metro, Caltrans and the Express Lane (HOT) Toll Operator.

      2) Provide at least one 12 ft wide lane on Vignes Street on- and off-ramps at Route 101. Ramps may be completely closed as shown in the table below:

Complete Ramp Closure Chart	
Day of the week	**Complete Ramp Closures hours**
Mondays through Thursdays	0:01AM to 6:00 AM 9:00AM 12:00 Noon 7:00PM to 11:59PM
Fridays	0:01AM to 6:00AM 7:00PM to 11:59PM
Saturdays and	0:01AM to 11:59PM

Sundays	

Complete ramp closures will not be permitted on designated legal holidays and special days per Metro.

Complete ramp closure hours of work shall be verified with Caltrans and City of Los Angeles.

On-ramp detour: detour traffic to continue on Cesar Chavez westbound; south on Alameda Street to the on-ramp to northbound Route 101. Coordinate with Caltrans and City of Los Angeles.

Off-ramp detour: detour traffic to continue on Route 101 northbound and use Alameda Street exit. When the off-ramp is completely closed, the contractor shall furnish and erect special signs (Vignes Street Off-ramp Closed Use Alameda Street) for exit ramp closures. Signs shall be placed on the right shoulder of freeway upstream of the preceding off-ramp. Coordinate with Caltrans and City of Los Angeles.

3) Safe and accessible pedestrian access, including disabled access, must be maintained at all times

b. Vignes Ramp Closures for Extended Periods

1. The Contractor can pursue the possibility of closing one or both Vignes ramps for extended periods (other than listed in the Complete Ramp Closure Chart above). The extended ramp closure approach has to be reviewed and approved by Metro and Caltrans before being implemented. The contractor shall be responsible for completing the project design and construction within the time frame (schedule) outlined for the Base bid. The complete closure of the Vignes Street ramps may involve the following requirements, but not limited to:

a. Develop all related traffic handling plans and obtain approval from Metro, Caltrans and City of Los Angeles.
b. Complete Ramp Closure Evaluation per Caltrans and Metro requirements.
c. Make necessary temporary traffic improvements at the intersection of Alameda Street and El Monte Busway to accommodate additional traffic detoured from the Vignes Street ramp.

d. Evaluate and mitigate traffic impacts due to any ramp closures on adjacent roadways and intersections. Potential temporary improvements may be, but not limited to restriping, modifying signal timing and detouring by routes.

2. The Contractor shall base his bid on the temporary closures noted in Paragraph C.1.a.2 above. If the Contractor elects to pursue the complete closure of Vignes Street ramps as described in this section, a written proposal shall be submitted in accordance with Section GC-35, Value Engineering Proposal (described elsewhere in the bid documents) to Metro for review and consideration. A contract Change Order (CO) will be issued if the proposal is accepted by Metro.

2. Protection of existing facilities

a. Protect existing improvements

1) Protect under General Conditions GC-26, Protection of Existing Structures, Equipment & Vegetation
2) Prepare protection plan indicating potential for damage to existing improvements and methods of protection

a) Include potential damage to City streets, utilities, freeway, busway, and buildings and other improvements at Patsaouras Plaza

b. Metro Red Line blast relief shaft

1) Do not block – maintain access and operability 24/7
2) Do not place construction equipment, stored materials, or other heavy loads above shaft
3) Maintain distance of at least 20 feet between shaft and pile drilling or other work

c. Metro Red Line tunnels

1) Submit proposed construction methods and measures for protection for Metro approval before any construction or site disturbance occurs
2) Determine suitable clearance envelope between new piles and tunnel walls in accordance with Metro's and Caltrans' design criteria and submit to Metro for approval prior to any construction or site disturbance

3. Materials

   a. Complying with Caltrans and AASHTO standards
   b. Concrete at exposed surfaces (visible to pedestrians or bus passengers) at pedestrian ramp, pedestrian overcrossing, pedestrian walkway, and busway platform

      1) Match color to existing arcade structure at plaza
      2) Horizontal surfaces stable, firm, and slip resistant; coefficient of friction (wet), ASTM C1028, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

4. Design, general

   a. Determine loads in accordance with applicable standards
   b. Match existing structure and appearance

      1) Of bridge
      2) Of barriers, except add signage and provide height as shown in Volume III, Preliminary Engineering Drawings

   c. Comply with Metro BRT Design Criteria 3.5.14, Corrosion Control

      1) Applies to concrete piles as well as metals

   d.) Pre-Design
      1) Confirm locations of Metro's Red Line tunnels, the CIDH Retaining Wall (Bents 6 & 7), and other existing underground features whose location will affect foundation layouts and other design tasks.

   d. Design process

      1) Project Definition Documents represent results of Advance Planning Studies under Caltrans
      2) For Bid Option 1: Revise Preliminary Engineering as required for the reduced lanes and obtain Metro and Caltrans approval
      2) Complete Type Selection Process and other Caltrans approval processes
      3) Perform geotechnical investigation, bridge design, and preparation of other supporting documentation and design guidance materials
      4) Geotechnical reports in Volume IV are provided as reference material only; borings conducted for the preliminary engineering shown in Volume IV were performed based on site access availability at the time; conduct additional boring

program and other geotechnical investigations as necessary or required by Caltrans to complete geotechnical reports, foundation designs, analysis, and structure design

7. Foundations

    a. Construct foundations without driving of piles, casings, or shells
    b. Do not subject existing belowgrade structures to vibration

8. Provide graffiti-resistant coatings approved by Caltrans and Metro for abovegrade surfaces

    a. Comply with Metro Standard Specifications 09860 for non-sacrificial graffiti-resistant coating on pedestrian surfaces and surfaces accessible from them
    b. Comply with Caltrans Standard Special Provision 59-810 for sacrificial graffiti-resistant coating on all other surfaces

D. Quality assurance and quality control

1. Per Caltrans standards
2. Perform all required quality assurance and quality control

E. Submittals

1. Design submittals

    a. Demolition plan
    b. Site-specific geotechnical report
    c. Log of test borings
    d. General plan and general notes
    e. Foundation plan and details
    f. Deck contour drawings
    g. Abutment plans and details
    h. Bent plans and details
    i. Deck slab reinforcement
    j. Typical section
    k. Shoring details
    l. Camber diagram
    m. Girder layout
    n. Structural calculations signed and sealed by a California registered professional engineer
    o. Construction specifications
    p. Copies of approvals and permits
    q. Geotechnical design reports
    r. Corrosion control plans

s. Type Selection Report approved by Caltrans and Metro
t. Seismic Evaluation Report for widened structure
u. Report for proposed construction methods and measures to be taken for protection of the existing Metro Red Line tunnels.

2. Construction submittals per Caltrans requirements

a. Including concrete lift drawings

DIVISION 60 – ARCHITECTURAL STRUCTURES

60.01 Station Platform Floor

A. Elements

1. Cast-in-place reinforced structural concrete slab
2. Brick-paver-like tile flooring
3. Visual pre-warning strip
4. Tactile warning surface
5. For underlying structure see Division 50, Civil Structures

B. Standards

1. California codes
2. Metro BRT standards
3. Caltrans standards
4. Accessibility standards
5. AWS, American Welding Society, www.awspubs.com/

    a. AWS D1.4, Structural Welding Code—Reinforcing Steel

6. CRSI, Concrete Reinforcing Steel Institute

    a. Manual of Standard Practice, available at www.crsi.org/archeng/index.cfm

7. TCNA, Tile Council of North America, www.tileusa.com/publication_main.htm

    a. Handbook for Ceramic Tile Installation
    b. ANSI standards A108, A118, A136, A137.1

8. Metro rail standards

    a. Standard Specifications 09860, Anti-Graffiti Coating

C. Performance and other requirements

1. Concrete slab

    a. Length and width: Comply with Volume III, Preliminary Engineering Drawings; dimensions on drawings are mandatory
    b. Depth: Providing required alignment of pedestrian platform slab with busway pavement elevation and bus door opening operations; critical parameter subject to Metro approval

        1) 8 inch maximum

2) Recess applied materials (tile flooring, visual warning strip, tactile warning surface) into platform slab as necessary
3) Coordinate with busway bridge design

c. Concrete

1) Materials to Caltrans standards
2) Finishes appropriate to receive indicated floor covering materials

d. Grout: ASTM C1107
e. Exposed surfaces: Stable, firm, and slip-resistant; coefficient of friction (wet), ASTM C1028 and ADAAG, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

2. Brick-paver-like tile flooring

a. Match appearance of brick pavers used in Patsaouras Plaza (see Specifications 40.02, Plaza Pavement/Masonry)

1) Tile flooring used on abovegrade structures need not be identical to brick pavers existing at the plaza level but must look the same (size, shape, colors, finish appearance, joint conditions, etc.)

b. Layout, colors, and color pattern consistent with conceptual scheme of brick pavers used in Patsaouras Plaza
c. Stable, firm and slip resistant

1) Coefficient of friction (wet), ASTM C1028 and ADAAG, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

d. Tile

1) High durability, unaffected by moisture, acids, oils, or chemicals, suitable for exterior use

a) Type: Paver tiles, ANSI 137.1

(1) Natural clay paver tiles, abrasive hardness rating of 50 or higher

2) Water absorption: 5% or less, ASTM E373 and ANSI 137.1
3) Unglazed

e. Mortar: Cementitious, high performance (tensile adhesion strength 145 psi or greater), flexible (deformable by 5 mm or more); meeting C2S2 classification under ISO 13007; ANSI A118.4
f. Grout: High performance, high abrasion resistance, reduced water absorption; meeting CG2AW classification under ISO 13007; ANSI A118.6
g. Installation

1) Full mortar bed, 1" thick
2) TCNA Handbook for Ceramic Tile Installation and applicable ANSI standards
3) Tile manufacturer's written instructions and recommendations

3. Visual pre-warning strip

a. Porcelain ceramic tile, ANSI A137.1

1) Type: Full-body
2) Dimensions: 6" x 6" x 1/2"
3) Surface: Textured per Metro existing installations
4) Finish: Unglazed, unpolished
5) Color: Black
6) Water absorption: Impervious, 0 to 0.5%, ASTM E373
7) Nonslip: Coefficient of friction (wet), ASTM C1028, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

b. Mortar: Cementitious, high performance (tensile adhesion strength 145 psi or greater), flexible (deformable by 5 mm or more); meeting C2S2 classification under ISO 13007; ANSI A118.4
c. Grout: High performance, high abrasion resistance, reduced water absorption; meeting CG2AW classification under ISO 13007; ANSI A118.6
d. Installation:

1) Full mortar bed, 1" thick
2) TCNA Handbook for Ceramic Tile Installation and applicable ANSI standards
3) Tile manufacturer's written instructions and recommendations

4. Tactile warning surface (detectable warning surface)

a. Tiles: Raised truncated domes, accessible, 24" wide

1) Compliant with accessibility standards

a) Including requirements of CBC 1121B.3.1.8.a

2) Products approved by California Department of General Services, Division of the State Architect, Access Compliance section, www.dgs.ca.gov/dsa/Programs/progAccess.aspx
3) Guide-dog friendly: Surfaces not hot to touch
4) Color: ADA standard yellow, Federal color no. 33538

a) Pigments: Pure mineral or synthetic, inorganic, UV resistant, non-fading, resistant to alkalinity; ASTM C979
b) All tiles from one batch lot to minimize color variation
c) Provide extra materials (2%, rounded up to nearest full carton) from same batch lot

5) Material: Fiber-reinforced, cementitious polymer composite with blended aggregates, reinforced by interwoven fiberglass matting, moisture cured, and factory finished with a permanent non-slip top surface
6) Physical properties:

a) Compressive strength, ASTM C39: 16,000 psi minimum
b) Tensile strength, ASTM C496: 2,700 psi minimum
c) Flexural ultimate strength, ASTM C947: 3,000 psi minimum
d) Abrasion, ASTM C418: 0.03 cm^3/cm^2 maximum
e) Water absorption, ASTM C97: 0.03% maximum
f) Freeze/thaw, ASTM C1262: 0.00% maximum

b. Mortar for wet installation: Mix 3:1:1 mixture of 3 parts portland cement (ASTM C150, Type I or II), aggregate (washed natural sand, ASTM C144), and water (potable) to produce mortar of consistent texture and quality
c. Anchoring bolts: Non-ferrous metal, at least 5 bolts per tile
d. Installation: Per Metro BRT Architectural Standard Drawings, Typical Platform Details, Sheets AS-004 and AS-008

1) Wet concrete installation required, using setting mortar; thinset, adhered, or fastened systems are not acceptable
2) Comply with tile manufacturer's installation instructions

5. Anti-graffiti treatment

a. Requirements apply to entire platform surface and exposed sides
b. Per referenced Metro rail standards

6. Cleanability

    a. Requirements apply to entire platform surface and exposed sides
    b. Cleanable using hot-water pressure water and Metro standard cleaning products without deterioration of surface, deterioration of components, water intrusion beneath tiles, or leakage

D. Quality assurance and quality control

    1. Per applicable standards

E. Submittals

    1. Product data
    2. Manufacturer's installation instructions
    3. Warranty
    4. Samples
    5. Color/finish selection
    6. Extra materials
    7. Per Caltrans standards for concrete slab

60.02 Canopies, Pedestrian Enclosures, and Railings

A. Elements

1. Station canopy
2. Pedestrian walkway enclosure
3. Pedestrian ramp / overcrossing enclosure
4. Handrails within pedestrian enclosures
5. Handrail structure at main stairs
6. Handrail structure at emergency egress stairs
7. Guardrails
8. For station canopy foundations see Specifications Division 50, Civil Structures

B. Standards

1. California codes
2. Metro BRT standards
3. Metro rail standards

    a. Metro Rail Design Criteria, Section 5, Structural/Geotechnical, with Section 5 Appendix, Metro Supplemental Seismic Design Criteria

4. Caltrans standards
5. Accessibility standards
6. Structural stainless steel

    a. ASCE, American Society of Civil Engineers, www.asce.org

        1) ASCE 8, Specification for the Design of Cold-Formed Stainless Steel Structural Members

    b. AWS, American Welding Society, www.awspubs.com/

        1) AWS D1.6, Structural Welding Code—Stainless Steel
        2) AWS D1.8, Structural Welding Code—Seismic Supplement (if applicable)

    c. SSINA, Specialty Steel Industry of North America, www.ssina.com

        1) Design Guidelines for the Selection and Use of Stainless Steel
        2) Specifications for Stainless Steel
        3) Stainless Steel for Structural Applications
        4) Stainless Steel Fasteners: A Systematic Approach to Their Selection

5) Stainless Steel Fabrication
6) Stainless Steel Architectural Facts
7) Standard finishes: Online data at www.ssina.com
8) Special Finishes for Stainless Steel (if applicable)

d. IMOA, International Molybdenum Association, www.imoa.info/moly_uses/moly_grade_stainless_steels/architecture/selection_system.html

1) Stainless Steel Evaluation System
2) Which Stainless Steel Should Be Specified for Exterior Applications

e. ASTM, www.astm.org/standards

1) A666, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar, for sheet, strip, plate, and flat bar for architectural and structural applications
2) A480, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip, for general requirements for plate, sheet, and strip
3) A554, Standard Specification for Welded Stainless Steel Mechanical Tubing, for welded round, square, and rectangular tubing for structural applications
4) A276, Standard Specification for Stainless Steel Bars and Shapes, for shapes for structural applications
5) A484, Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings, for general requirements for bars and shapes
6) A555, Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods, for wire and rods
7) A312, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes, for pipe
7) F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs, for bolts, screws, and studs
8) F594, Standard Specification for Stainless Steel Nuts, for nuts
9) E527, Standard Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS), for Unified Numbering System (UNS) for metals

f. NAAMM, National Association of Architectural Metal Manufacturers, https://www.naamm.org/onlinestore/default.aspx

1) Metal Finishes Manual for Architectural and Metal Products

7. Structural steel (non-stainless)

a. ASCE, American Society of Civil Engineers, www.asce.org

1) ASCE 7, Minimum Design Loads for Buildings and Other Structures

b. AISC, American Institute of Steel Construction, www.aisc.org/store

1) AISC 325, Steel Construction Manual, including:

a) AISC 360, Specification for Structural Steel Buildings
b) RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts
c) AISC 303, Code of Standard Practice for Steel Buildings and Bridges

2) AISC 341, Seismic Provisions for Structural Steel Buildings

c. American Welding Society, www.awspubs.com/

1) AWS D1.1, Structural Welding Code—Steel
2) AWS D1.3, Structural Welding Code—Sheet Steel
3) AWS D1.8, Structural Welding Code—Seismic Supplement

d. ASTM, ASTM International, www.astm.org/standards

1) A36 or A572, Grade 50, and A992 for steel shapes
2) A53, Type E or S, Grade B, for steel pipe
3) A500, Grade B, cold-formed, for structural tubing
4) A36 or A675, Grade 75, for bar stock for anchor bolts
5) A325 for high strength bolts, nuts, and washers
6) A307, non-headed type, or A449, for anchor bolts; A354 at frames
7) A490, 150 ksi minimum tensile strength, for heat treated structural steel bolts

e. NAAMM, National Association of Architectural Metal Manufacturers, https://www.naamm.org/onlinestore/default.aspx

1) Metal Finishes Manual for Architectural and Metal Products

f. SSPC, Society for Protective Coatings, www.sspc.org

1) SSPC-SP 6, Commercial Blast Cleaning

2) SSPC-Paint 25 BCS, Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Blast Cleaned Steel (or other as recommended by coating manufacturer)

8. Stainless steel (non-structural)

a. AWS, American Welding Society, www.awspubs.com/

1) AWS D1.6, Structural Welding Code—Stainless Steel

b. SSINA, Specialty Steel Industry of North America, www.ssina.com

1) Design Guidelines for the Selection and Use of Stainless Steel
2) Specifications for Stainless Steel
3) Stainless Steel Fasteners: A Systematic Approach to Their Selection
4) Stainless Steel Fabrication
5) Stainless Steel Architectural Facts
6) Standard finishes: Online data at www.ssina.com
7) Special Finishes for Stainless Steel (if applicable)

c. IMOA, International Molybdenum Association, www.imoa.info/moly_uses/moly_grade_stainless_steels/architecture/selection_system.html

1) Stainless Steel Evaluation System
2) Which Stainless Steel Should Be Specified for Exterior Applications

d. ASTM, www.astm.org/standards

1) A666, Standard Specification for Annealed or Cold-Worked Stainless Steel Sheet, Strip, Plate, and Flat Bar
2) A480, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
3) A554, Standard Specification for Welded Stainless Steel Mechanical Tubing
4) A276, Standard Specification for Stainless Steel Bars and Shapes
5) A484, Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings
6) A555, Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods

7) A312, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
8) F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
9) F594, Standard Specification for Stainless Steel Nuts
10) E527, Standard Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

e. NAAMM, National Association of Architectural Metal Manufacturers, https://www.naamm.org/onlinestore/default.aspx

1) Metal Finishes Manual for Architectural and Metal Products

C. Performance and other requirements

1. Structural:

a. Design to applicable standards
b. Design to prevent deflection of structures and panels under wind, which may require exceeding code requirements
c. Do not use mild strength carbon steel bolts and nuts (ASTM A307) for permanent connections

2. Durability and maintainability

a. Of materials and design to resist vandalism, incidental damage, and wear
b. Able to be repaired and refinished without marring or loss of visual continuity
c. Suitable for lack of washing and other maintenance without loss of appearance or durability

3. Resistance to corrosion

a. Of materials and design to prevent pitting and other corrosion under conditions of use (including urban pollution, industrial pollution, vehicle exhaust and contaminants, climate, and horizontal surfaces, assuming no washing maintenance) under IMOA guidelines
b. Assume acid rain conditions per Sections 2.2.2 and 2.2.6 of the Metro BRT Design Guidelines, meaning that standard metals and finishes are subject to premature oxidation or deterioration
c. Materials will be subject to continuous exterior exposure to sun, rain, humidity, condensation, and wind
d. Components will be subject to movement
e. Select top quality materials specifically formulated to not corrode under these conditions

4. Aesthetics

    a. Uniform appearance and unified design
    b. Free of blemishes, marks, discoloration
    c. Produced to highest commercial standard for flatness
    d. Without deflection or oil canning
    e. Edges and corners smooth, sharp and true to angle or curvature
    f. Welds continuous, matching in color and grain, and ground flush and smooth
    g. Concealed fasteners
    h. Panels formed from single sheets without splice joints
    i. No visual defects when viewed from 3 feet at 100 footcandles

5. Functionality

    a. Edges and corners smooth
    b. Support capacity for lighting and communications components and concealment of cables/wiring
    c. Minimized opportunities for bird nesting and roosting – e.g., closed ends on tubing, nooks and crannies enclosed/covered
    d. Designed to withstand movement of all kinds, including thermal expansion and contraction, wind, seismic, live loads, etc.
    e. Meeting accessibility requirements and maintaining indicated clear area without intrusions

6. Materials

    a. Structural stainless steel

        1) Austenitic (300 series) structural stainless steel, cold-worked
        2) Corrosion-resistant, containing not less than: 16-18% chromium, 10-14% nickel, and 2-3% molybdenum
        3) Acceptable types:

            a) SAE Type 316 (UNS S31600 under ASTM E527)
            b) SAE Type 317 (UNS S31700 under ASTM E527)

    b. Structural steel (non-stainless)

        1) Comply with referenced standards
        1) Meet requirements for architecturally exposed structural steel

    c. Stainless steel (non-structural)

        1) Austenitic (300 series) stainless steel

2) Type 316 or Type 317
3) Comply with referenced standards

d. Mechanical finishes – stainless steel

1) Standard polished finish, No. 4 brushed or smoother; cleaned and passivated, ASTM A380
2) Polished using only silicon carbide abrasives for corrosion resistance, using fine grit for smoothness
3) Surface roughness: Roughness average ($R_{a)}$ lowest commercially available to reduce corrosion
4) Grain orientation (where applicable): Vertical to facilitate contaminant removal

e. Applied finishes – non-stainless steel

1) Coating system (surface preparation, primer, intermediate coat, and finish coat) recommended by reputable industrial coatings manufacturer for exterior steel exposed to aggressive atmospheric corrosion and other conditions of use
2) Quality standard: Systems recommended by Tnemec Company, or equal
3) Minimum acceptable coating system must require surface preparation using commercial blast cleaning under SSPC standards
4) Primer must meet or exceed benefits of listed standard; standard shop primer is not acceptable
5) Comply with SCAQMD VOC limits

f. Station canopy

1) Rigid-frame structure with support columns, beams, hollow ornamental framework, corrugated roof deck, and closure plates at end
2) Material: Structural steel; structural stainless steel for roof deck
3) Columns: Hollow box sections tapered in one direction
4) Beams: Tapered beams extending full width of roof structure
5) Ornamental framework: Hollow structural sections, supporting suspended items such as signage and wayfinding components
6) Deck basis of design: Epic Metals Corporation, www.epicmetals.com , Epicore ER 3.5 dovetail non-acoustical roof deck; no exposed fasteners
7) Drainage: Canopy shall slope to internal gutters which drain to pipes located within the columns

8) Raceways: Included at each side of canopy structure to house conduits for electrical, security, and communications
9) Matching finish on ornamental framework, columns, beams, raceways, and closure plates

g. Protective enclosure

1) Stainless steel, openings in material sized per Drawings
2) Opening sizes subject to Caltrans approval
3) For Bid Option 2 ceiling alternative see Section 01010-DB, Summary of Work, in the General Requirements

h. Fasteners and accessories: Stainless steel, structural quality
i. Railings

1. Continuous pipe/tube rails with pipe/tube supports
2. Structural stainless steel
3. For integral lighting at stairs, see Specifications 70.07, Structure Lighting

j. Bicycle tracks: Stainless steel, structural quality

D. Quality assurance and quality control

1. Design performed, signed, and sealed by a California-registered structural engineer
2. Qualified fabricator who participates in the AISC Certification Program and is designated an AISC Certified Plant, Category STD at time of bid
3. Mock-ups

E. Submittals

1. Calculations
2. Product and material data, including test reports
3. Mill test reports for structural steel, including physical and chemical
4. Samples
5. Finish selection
6. Shop drawings
7. Welding certificates and welding procedure specifications
8. Qualifications of fabricator and installer

60.03 Pedestrian Ramp / Overcrossing and Pedestrian Walkway Floor

A. Elements

1. Concrete floor finish
2. Brick-paver-like tile flooring at landings
3. For improvements other than floors, see Specifications 60.02, Canopies, Pedestrian Enclosures, and Railings, and other divisions of the Specifications

B. Standards

1. Accessibility standards
2. California codes
3. TCNA, Tile Council of North America, www.tileusa.com/publication_main.htm

    a. Handbook for Ceramic Tile Installation
    b. ANSI standards A108, A118, A136, A137.1

4. Metro rail standards

    a. Standard Specifications 09860, Anti-Graffiti Coating

C. Performance and other requirements

1. Concrete floor finish

    a. Broom finish
    b. Abrasive finish to meet accessibility requirements
    c. Dry-shake floor hardener

2. Brick-paver-like tile flooring

    a. Match appearance of brick pavers used in Patsaouras Plaza (see Specifications 40.02, Plaza Pavement/Masonry)

        1) Tile flooring used on abovegrade structures need not be identical to brick pavers existing at the plaza level but must look the same (size, shape, color, finish appearance, joint conditions, etc.)

    b. Layout, colors, and color pattern consistent with conceptual scheme used for brick pavers in Patsaouras Plaza
    c. Stable, firm, and slip-resistant

1) Coefficient of friction (wet), ASTM C1028 and ADAAG, 0.60 or higher in flat areas, 0.80 or higher in sloping areas

d. Tile

1) High durability, unaffected by moisture, acids, oils, or chemicals, suitable for exterior use

a) Type: Paver tiles, ANSI 137.1

(1) Natural clay paver tiles, abrasive hardness rating of 50 or higher

2) Water absorption: 5% or less, ASTM E373 and ANSI 137.1
3) Unglazed

e. Mortar: Cementitious, high performance (tensile adhesion strength 145 psi or greater), flexible (deformable by 5 mm or more); meeting C2S2 classification under ISO 13007; ANSI A118.4
f. Grout: High performance, high abrasion resistance, reduced water absorption; meeting CG2AW classification under ISO 13007; ANSI A118.6
g. Installation

1) Full mortar bed, 1" thick
2) TCNA Handbook for Ceramic Tile Installation and applicable ANSI standards
3) Tile manufacturer's written instructions and recommendations

3. Anti-graffiti treatment

a. Per referenced Metro rail standards

D. Quality assurance and quality control

1. Source limitations

a. Obtain tile from a single manufacturer, from same production run, and of consistent quality in appearance and physical properties
b Obtain setting and grouting materials ingredients of uniform quality for each component from one manufacturer and each aggregate from one source or producer

2. Mockup
3. Preinstallation conference

E. Submittals

1. Product data
2. Manufacturer's installation instructions
3. Warranty
4. Samples, including color range
5. Color/finish selection
6. Extra materials

60.04 Elevator Enclosure

A. Elements

1. Foundations
2. Elevator pit and sump
3. Structural steel frame and roof deck
4. Glass and steel wall system
5. Doors and frames
6. Membrane roof assembly

B. Standards

1. California codes
2. Metro BRT standards
3. Caltrans standards
4. Accessibility standards
5. Metro rail standards – Standard Specifications

    a. 03100 – Concrete Formwork
    b. 03200 – Concrete Reinforcement
    c. 03300 – Cast-in-Place Concrete
    d. 03600 – Grout
    e. 05120 – Structural Steel
    f. 05300 – Metal Decking
    g. 07530 – Elastic Sheet Roofing
    h. 07600 – Flashing and Sheet Metal
    i. 08800 – Glass and Glazing
    j. Others as required

6. ASCE, American Society of Civil Engineers, www.asce.org

    a. ASCE 7, Minimum Design Loads for Buildings and Other Structures

7. AISC, American Institute of Steel Construction, www.aisc.org/store

    a. AISC 303, Code of Standard Practice for Steel Buildings and Bridges
    b. AISC 360, Specification for Structural Steel Buildings
    c. AISC 341, Seismic Provisions for Structural Steel Buildings
    d. AISC 325, Steel Construction Manual

8. SDI, Steel Deck Institute, www.sdi.org/manuals.htm

    a. SDI 31, Design Manual for Composite Decks, Form Decks and Roof Decks

9. AWS, American Welding Society, www.awspubs.com/

   a. AWS D1.1, Structural Welding Code—Steel
   b. AWS D1.4, Structural Welding Code—Reinforcing Steel

10. AAMA, American Architectural Manufacturers Association, www.aamanet.org

    a. Aluminum Storefront and Entrance Manual
    b. Glass and Glazing

11. GANA, Glass Association of North America, www.glasswebsite.com

    a. GANA Glazing Manual

12. SDI, Steel Door Institute, www.steeldoor.org

    a. SDI 108, Recommended Selection and Usage Guide for Standard Steel Doors
    b. SDI 100/ANSI A250.8, Recommended Specifications for Standard Steel Doors and Frames
    c. Others as applicable

13. NRCA, National Roofing Contractors Association, www.nrca.net/rp/pubstore/

    a. NRCA Roofing Manual: Membrane Roof Systems

14. FM, FM Global, www.fmglobal.com/page.aspx?id=04010200

    a. FM 1-28, Loss Prevention Data Sheet—Wind Design
    b. FM 1-29, Loss Prevention Data Sheet—Roof Deck Securement and Above-Deck Roofing Components

C. Performance and other requirements

1. Coordination

   a. Comply with General Requirements 01046-DB, Elevator Interface

2. Structural

   a. Do not use mild strength carbon steel bolts and nuts (ASTM A307) for permanent connections

3. Energy and thermal efficiency

    a. Minimum R-30 roof, R-19 walls
    b. Greater as required by code or sustainability requirements

4. Resistance to corrosion

    a. Of materials and design to prevent pitting and other corrosion under conditions of use (including urban pollution, industrial pollution, vehicle exhaust and contaminants, climate, and horizontal surfaces, assuming no washing maintenance) under IMOA guidelines
    b. Assume acid rain conditions per Sections 2.2.2 and 2.2.6 of the Metro BRT Design Guidelines, meaning that standard metals and finishes are subject to premature oxidation or deterioration
    c. Materials will be subject to continuous exterior exposure to sun, rain, humidity, condensation, and wind
    d. Components will be subject to movement
    e. Select top quality materials specifically formulated to not corrode under these conditions

5. Materials:

    a. Steel wall system

        1) Comply with requirements for architecturally exposed structural steel
        2) High performance coating system
        3) Embossed metal panels at spandrels

    b. Insulating glass

        1) Certified under ASTM E2190 by the Insulating Glass Certification Council, www.igcc.org/ ; 1" depth
        2) Fully tempered glass
        3) Fritted, etched, or painted in pattern matching existing square-within-square pattern at arcade

    c. Exterior door and frame

        1) Steel, galvanized, 16 gauge
        2) Extra heavy duty under SDI standards
        3) Fully welded
        4) Security hardware
        5) Suitable for exterior application

d. Roof system

1) Membrane over rigid insulation
2) Polyvinyl chloride (PVC) membrane reinforced with polyester grid, ASTM D4434, Type IV
3) Installation, ASTM D5036, D5082
4) Roof drainage specialties

D. Quality assurance and quality control

1. Per referenced standards
2. Mockup of wall system
3. Qualified installers
4. Qualified manufacturers for glass and steel wall system
5. Qualified manufacturer for roof system

E. Submittals

1. Per referenced standards
2. Product data
3. Shop drawings
4. Test reports

60.05 Elevator Machine Room

A. Elements

1. Foundations
2. Structural steel frame and roof deck
3. Envelope
4. Doors and frames
5. Roof assembly
6. Roof parapet

B. Standards

1. California codes
2. Metro BRT standards
3. Caltrans standards
4. Accessibility standards
5. Metro rail standards – Standard Specifications

    a. 03100 – Concrete Formwork
    b. 03200 – Concrete Reinforcement
    c. 03300 – Cast-in-Place Concrete
    d. 03600 – Grout
    e. 05120 – Structural Steel
    f. 05300 – Metal Decking
    g. 07530 – Elastic Sheet Roofing
    h. 07600 – Flashing and Sheet Metal
    i. Others as required

6. ASCE, American Society of Civil Engineers, www.asce.org

    a. ASCE 7, Minimum Design Loads for Buildings and Other Structures

7. AISC, American Institute of Steel Construction, www.aisc.org/store

    a. AISC 303, Code of Standard Practice for Steel Buildings and Bridges
    b. AISC 360, Specification for Structural Steel Buildings
    c. AISC 341, Seismic Provisions for Structural Steel Buildings
    d. AISC 325, Steel Construction Manual

8. SDI, Steel Deck Institute, www.sdi.org/manuals.htm

    a. SDI 31, Design Manual for Composite Decks, Form Decks and Roof Decks

9. AWS, American Welding Society, www.awspubs.com/

    a. AWS D1.1, Structural Welding Code—Steel
    b. AWS D1.4, Structural Welding Code—Reinforcing Steel

10. NRCA, National Roofing Contractors Association, http://www.nrca.net/rp/pubstore/

    a. NRCA Roofing Manual: Membrane Roof Systems

11. FM, FM Global, www.fmglobal.com/page.aspx?id=04010200

    a. FM 1-28, Loss Prevention Data Sheet—Wind Design
    b. FM 1-29, Loss Prevention Data Sheet—Roof Deck Securement and Above-Deck Roofing Components

C. Performance and other requirements

1. Coordination

    a. Comply with General Requirements 01046-DB, Elevator Interface

2. Structural

    a. Do not use mild strength carbon steel bolts and nuts (ASTM A307) for permanent connections

3. Energy and thermal efficiency

    a. Minimum R-30 roof, R-19 walls
    b. Greater as required by code or by sustainability requirements

4. Durability and maintainability

    a. Of materials and design to resist vandalism, incidental damage, and wear
    b. Able to be repaired and refinished without marring or loss of visual continuity
    c. Of materials and design to retain clean, sound, undeteriorated, unoxidated, and uniform appearance without washing and other maintenance other than normal rainfall
    d. Note that Metro standards rule out various finishes, such as stucco, for reasons of durability and maintainability

5. Resistance to corrosion

    a. Of materials and design to prevent pitting and other corrosion under conditions of use (including urban pollution, industrial pollution, vehicle exhaust and contaminants, climate, and horizontal surfaces, assuming no washing maintenance) under IMOA guidelines
    b. Assume acid rain conditions per Sections 2.2.2 and 2.2.6 of the Metro BRT Design Guidelines, meaning that standard metals and finishes are subject to premature oxidation or deterioration
    c. Materials will be subject to continuous exterior exposure to sun, rain, humidity, condensation, and wind
    d. Components will be subject to movement
    e. Select top quality materials specifically formulated to not corrode under these conditions

6. Roof system

    a. Membrane over rigid insulation
    b. Polyvinyl chloride (PVC) membrane reinforced with polyester grid, ASTM D4434, Type IV
    c. Installation, ASTM D5036, D5082
    d. Roof drainage specialties

7. Roof parapet

    a. Screen air conditioning unit and other rooftop improvements from view and block noise transmission

        1) Fully screen view from plaza level
        2) Screen view and noise from abovegrade structures by parapet to maximum extent feasible
        3) For additional screening of air conditioning unit see Specifications 70.05, Structure HVAC

8. Exterior door and frame

    a. Steel, galvanized, 16 gauge
    b. Extra heavy duty under SDI standards
    c. Fully welded
    d. Security hardware
    e. Suitable for exterior application

9. Wiring
    a. Only wiring that is only used directly in connection with the elevators is allowed in the Elevator Machine Room in accordance with California Energy Code Section 620.37. A separate electrical room

shall be provided and sized accordingly for all other electrical panels and equipment

D. Quality assurance and quality control

1. Per referenced standards
2. Qualified manufacturer for roof system

E. Submittals

1. Per referenced standards
2. View study analyzing effectiveness of parapet wall
3. Product data
4. Shop drawings
5. Test reports

60.06 Stairs

A. Elements

1. Main stairs from plaza
2. Emergency egress stairs
3. For handrails/guardrails, enclosure, bicycle tracks, and related components, see Specifications 60.02, Canopies, Pedestrian Enclosures, and Railings

B. Standards

1. For standards see Specifications 50.01, Civil Structures and Canopy Foundations, and Specifications 60.01, Station Platform Floor

C. Performance and other requirements

1. Concrete stairs

a. Include abrasive metal stair nosings
b. Include contrast strips
c. Include concrete color to match existing arcade
d. Include bicycle track

1) Material: Structural stainless steel in accordance with Specifications 60.02, Canopies, Pedestrian Enclosures, and Railings

2. Maintain accessible clear area without intrusion of utility junction boxes, fixtures, or other impediments

D. Quality assurance and quality control

1. Per referenced standards

E. Submittals

1. Per referenced standards
2. Product data
3. Test and inspection reports

60.07 Arcade Structure

A. Elements

1. Foundations
2. Structure
3. Restore exposed surfaces at partial demolition

B. Standards

1. California codes
2. ACI, American Concrete Institute, www.concrete.org/bookstorenet/default.aspx

    a. ACI 318, Building Code Requirements for Structural Concrete

3. Metro BRT standards
4. City of Los Angeles
5. Metro rail standards

    a. Standard Specifications 03347, Exposed Finish Concrete

C. Performance and other requirements

1. Foundations designed by Contractor
2. Structure

    a. Cast-in-place or precast reinforced concrete columns and beams
    b. Sandblast finish to match existing
    c. Color of concrete to match existing

3. Restore and refinish exposed surfaces where portion of existing structure was removed (see Specifications 10.03, Selective Demolition)

    a. Match existing

D. Quality assurance and quality control

1. Color samples
2. Mock-up of concrete finishing to match existing
3. Per applicable standards

E. Submittals

1. Design and construction details
2. Finishing procedure

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DIVISION 70 – SERVICES FOR STRUCTURES

70.01 Elevators

A. Elements

1. Hydraulic passenger elevators
2. Related work
3. Coordination
4. For related work and coordination see General Requirements 01046-DB, Elevator Interface (work to be paid under this Section 70.01)
5. For limitations on use of elevators during construction see General Requirements Section 01013-DB, Contractor's Use of Worksite

B. Standards

1. ANSI standards (American National Standards Institute) developed by ASME (American Society of Mechanical Engineers), available at http://catalog.asme.org/

    a. ANSI/ASME A17.1, Safety Code for Elevators and Escalators
    b. ANSI/ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks
    c. ANSI/ASME A17.5, Elevator and Escalator Electrical Equipment

2. California codes

    a. Including Cal/OSHA Elevator Safety Orders, available at www.dir.ca.gov/dosh/elevator.html

3. Accessibility standards
4. APTA, American Public Transportation Association, www.aptastandards.com

    a. Heavy Duty Transportation System Elevator Design Guidelines, available at www.aptastandards.com/Documents/TechnicalSpecifications/ElevatorsandEscalatorsTechnicalSpecifications/tabid/269/Default.aspx

5. Metro rail standards

    a. Metro Rail Design Criteria, Section 6, Architectural
    b. Architectural Standard and Directive Drawings

C. Performance and other requirements

1. Two heavy duty transit passenger elevators
2. Type: Hydraulic
3. Operation system: Selective-collective automatic

4. Power: Rescue package/battery lowering device if not on emergency power
5. Oil cooler
6. Soft starts
7. Controllers and door operator: Non-proprietary
8. Passenger loads: To be verified per APTA guidelines.
9. Elevator speed: Not less than 150 fpm; per APTA standards
10. Signal equipment: Per Metro rail standards
11. Minimum inside clear cab dimensions: As shown on Drawings
12. Dual-opening (both directions)

    a. Automatically controlled to allow opening only in desired direction at each landing

13. Doors: Minimum 3'-6" opening, center double doors with stainless steel cores
14. Glass cab; laminated, fully tempered safety glass; stainless steel frames
15. Finishes

    a. Floor: Stainless steel, diamond plated flooring formed into a pan for ease of cleaning, with welded seams and flashing, sealed at doorway and flashing
    b. Sills: Stainless steel or nickel silver
    c. Cab interior: Textured stainless steel, Rigidized Metals Corporation texture 5.WL, 6.WL, or equivalent

16. Security: Provide CCTV camera in elevator cab
17. Pushbuttons: Vandal-resistant; ERM Corp. CA-93 or equivalent
18. Car Operation Panel (COP): Engraved; no plastic signage or decals
19. Fire/emergency operation signage: Engraved; no plastic signage or decals
20. Stop switches: Keyed, with Elevator Products Corporation (EPCO) EPCO-1 barrel key
21. Fireman's service key: Innovation Industries EX515
22. Telephone: Compatible with Metro system
23. Monitoring: Remote monitoring capability (SCADA) compatible with Metro system
24. Onsite diagnostic capability to diagnose faults and location, to the level of individual circuit boards and individual discrete components of the solid state elevator controller

    a. If diagnostic equipment is not completely self-contained within the controllers but requires a separate, detachable device, provide that device to Metro as part of the installation and as Metro's property

25. Maintainability

    a. Installation shall be maintainable by any licensed elevator maintenance company employing journeyman mechanics, without

the need to purchase or lease additional diagnostic devices, special tools, or instructions from original equipment manufacturer

b. Replacement parts and maintenance tools must be readily available to Metro through normal purchasing channels

c. Equipment must not require special adjusting or troubleshooting or tools not generally available

D. Quality assurance and quality control

1. Metro approval of all aspects
2. Include 12 months' warranty maintenance service, including the following at no cost to Metro:

a. Maintenance tasks; include list of tasks and their frequency
b. All service calls
c. Service calls and repairs due to vandalism and abuse
d. 24-hour emergency response
e. Response time within 45 minutes from 6 am to 9 pm, 365 days per year

4. Elevator performance condition must be met

a. During final 30 days of warranty maintenance period:

1) Elevators must run reliably and safely, with no more than 3 similar trouble calls within a 96-hour period
2) No component failure shall cause an elevator to be out of service for more than 24 consecutive hours

b. If elevator performance condition is not met:

1) Metro will notify Contractor, in writing or electronically
2) Contractor must immediately make repairs and notify Metro of completion of repairs
3) After repairs, 30-day observation period begins again and elevator must meet elevator performance condition for the next 30 days
4) If condition is not met, repeat process until condition is satisfied

3. Installed equipment not meeting all requirements shall be removed and replaced with conforming equipment at no cost to Metro

E. Submittals

1. Product data
2. Shop drawings
3. Operation and maintenance manuals
4. Certifications

5. Spare parts and tools

   a. Detailed list of spare parts for each individual unit
   b. Software, tools, and diagnostic equipment for any proprietary elevator equipment
   c. Provide all top-level, solid state diagnostic tools and related software and documentation that elevator manufacturer provides to authorized adjusters and service personnel

70.02 Structure Water, Domestic

A. Elements

1. Hose bibs

a. At bus platform
b. At pedestrian walkway
c. At pedestrian ramp / overcrossing
d. At elevator machine room

B. Standards

1. California codes
2. Metro BRT Design Criteria

a. 8.2, Plumbing
b. 3.5.14, Corrosion Control

3. City of Los Angeles

C. Performance and other requirements

1. Quantity and locations

a. At platform, minimum two hose bibs, located approx. 50 feet from ends of platform, no more than 100 feet apart
b. At pedestrian walkway, maximum distance 100 feet apart, including maximum 100 feet from nearest bib on platform
c. At pedestrian ramp / overcrossing, located at elevator landing and at landing joining the pedestrian walkway
d. At elevator machine room, located on outer face of exterior wall

2. Design

a. At platform, pedestrian walkway, and pedestrian ramp / overcrossing, recessed in security lock box
b. At elevator machine room, recessed in security lock box
c. Acorn Engineering 8151 recessed hose box with locking door, all stainless steel (including frame, body, door, interior parts, and wall flanges), with vacuum breaker and key operated control valve; or equal

D. Quality assurance and quality control

1. Comply with referenced standards

E. Submittals

1. Product data

70.03 Structure Water, Fire Protection

A. Elements

1. Fire water lines within structures
2. Fire sprinkler system at elevator machine room
3. Other as required

B. Standards

1. California codes
2. NFPA, National Fire Protection Association, www.nfpa.org/aboutthecodes/list_of_codes_and_standards.asp

    a. NFPA 13, Standard for the Installation of Sprinkler Systems

3. City of Los Angeles

    a. Los Angeles Fire Department (LAFD)

4. Metro BRT Design Criteria

    a. 3.5.14, Corrosion Control

C. Performance and other requirements

1. Fire water lines within structures

    a. Comply with NFPA 13
    b. Comply with Metro BRT Design Criteria 3.5.14, Corrosion Control

2. Double-interlock preaction fire sprinkler system for elevator machine room

    a. Preaction control panel in lockable closet

D. Quality assurance and quality control

1. California codes and City of Los Angeles

E. Submittals

1. Product data for all products
2. Calculations and plans for approval by Metro and by LAFD

70.04 Structure Drainage

A. Elements

1. Trench drains at each landing on pedestrian walkway
2. Trench drains at pedestrian ramp / overcrossing
3. Roof drains and overflow drains on canopy at station platform
4. Internal stainless steel drainage pipes at each column supporting platform canopy, pedestrian walkway, and pedestrian ramp / overcrossing
5. Discharge at base of columns to storm drain system (except discharge overflow drains to grade)
6. Roof drainage specialties for elevator enclosure
7. Roof drainage specialties for elevator machine room

B. Standards

1. Caltrans standards
2. California codes

    a. Including California Plumbing Code

3. Metro BRT Design Criteria

    a. 8.2 Plumbing
    b. 3.5.14 Corrosion Control

C. Performance and other requirements

1. Calculate drainage quantities under Caltrans standards
2. Collect drainage and convey to storm drain system

    a. Prevent surface flow on structures which would cause staining over time

3. Special grating designs typical of Metro installations
4. Only wiring that is only used directly in connection with the elevators is allowed in the Elevator Machine Room in accordance with California Energy Code Section 620.37. A separate electrical room shall be provided and sized accordingly for all other electrical panels and equipment

D. Quality assurance and quality control

1. Per Caltrans standards and City of Los Angeles

E. Submittals

1. Product data

70.05 Structure HVAC

A. Elements

1. Air conditioning system for elevator machine room
2. Related components such as louver, filter, etc. as required
3. Visual and noise screening of air conditioning unit
4. Natural ventilation elsewhere

B. Standards

1. Metro BRT Design Criteria

    a. Section 8, Mechanical
    b. 3.5.14, Corrosion Control

2. California codes

    a. Include California Mechanical Code, available through www.bsc.ca.gov/default.htm
    b. Including Energy Efficiency Standards for Residential and Nonresidential Buildings, energy.ca.gov/title24/

3. AHRI, Air-Conditioning, Heating, and Refrigeration Institute, ahrinet.org

    a. AHRI Guideline B, Roof Mounted Outdoor Air-Conditioner Installations
    b. AHRI standards as applicable

4. ASHRAE, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, www.ashrae.org

    a. ASHRAE 15, Safety Standard for Refrigeration Systems

C. Performance and other requirements

1. Independent HVAC system serving only elevator machine room

    a. High efficiency roof mounted air conditioning unit
    b. Protect from vandalism
    c. Provide standard-sized filter in easily accessible location

2. System designed to maintain room temperature within required limits while conserving energy

    a. Achieve temperature limits set by elevator equipment manufacturer

3. High efficiency equipment with maximum SEER rating available in the market
4. Keep room pressure slightly positive to prevent dust from entering the room
5. Verify design dry bulb temperature for elevator equipment with elevator manufacturer
6. Equipment, products, and installation meeting industry standards

    a. AHRI Certified for performance capacity
    b. Compliant with AHRI standards applicable to equipment used
    c. ASHRAE compliant

7. Screened for view and noise

    a. Block view of air conditioning unit from abovegrade structures by roof parapet to maximum extent possible; see Specifications 60.05, Elevator Machine Room
    b. Provide additional visual screening or enclosure to completely block view of air conditioning unit from station platform, pedestrian walkway, and pedestrian ramp / overcrossing (which includes elevator platform) as approved by mechanical engineer
    c. Incorporate noise reduction in screening
    d. Screening design and materials subject to Metro approval

D. Quality assurance and quality control

1. Per AHRI standards

E. Submittals

1. Product data including CEC certification
2. View and noise analysis

70.06 Structure Electrical

A. Elements

1. Panels
2. Transformer
3. Conduit
4. Wiring
5. Emergency generator if required

B. Standards

1. California codes
2. City of Los Angeles
3. Metro BRT Design Criteria

    a. Section 7, Electrical
    b. 3.5.14, Corrosion Control

C. Performance and other requirements

1. Metro rail standards – Standard Specifications

    a. 16050, Basic Electrical Materials and Methods

2. Provide independent emergency generator if requested by Metro; consult with Metro
3. Waterproof where not interior to a fully enclosed building

D. Quality assurance and quality control

1. UL listing

E. Submittals

1. Product data for panels, transformer, conduit, wiring, and emergency generator if required
2. SCAQMD permit for emergency generator

70.07 Structure Lighting

A. Elements

1. Exterior lighting

    a. Bus platform
    b. Pedestrian walkway
    c. Pedestrian ramp / overcrossing (which includes upper elevator platform)
    d. Elevator platforms (plaza level and parking level)
    d. Stairs

2. Interior lighting

    a. Elevator machine room
    b. Elevator enclosure

B. Standards

1. California codes

    a. California Electrical Code
    b. California Energy Commission building standards
    c. Cal/OSHA safety orders

2. Metro BRT standards

    a. BRT Design Criteria

        1) Section 7, Electrical
        2) 3.5.14, Corrosion Control

3. Metro rail standards – Metro Rail Design Criteria

    a. Section 7, Electrical

4. Caltrans standards
5. Accessibility standards
6. NFPA 70, National Electrical Code
7. IES, Illuminating Engineering Society of North America, www.iesna.org

    a. ANSI/ASHRAE/IESNA Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings

8. UL, Underwriters Laboratories, ulstandardsinfonet.ul.com/scopes

C. Performance and other requirements

1. Functionality

a. Provide average light levels as follows (see Metro design criteria documents for additional details)

1)	Bus loading/unloading areas	7 fc
2)	Pedestrian walkways	3.5 fc
3)	Future fare equipment	10 fc
4)	Stairs, at steps	5 fc
5)	Stairs, at points of transition	5 fc

b. Enhance and clarify wayfinding by visual cues from lighting

2. Energy efficiency

a. Optimize energy efficiency of light sources as appropriate to technical needs of the spaces
b. Comply with lighting power density requirements of California codes
c. Lamps

1) High color rendering: 80 CRI or greater
2) Low mercury

d. Ballasts and transformers

1) Select for appropriate performance and energy efficiency
2) Integral HPF electronic ballasts
3) Integral electronic generators for induction lamps
4) Remote location electronic transformers for LED lamps integral to handrails

a) Secure, accessible, well ventilated, enclosed
b) Include power supplies, drivers, and power feeds

3. Shielding

a. Minimize light trespass
b. Minimize glare
c. Minimize light pollution of night sky

1) Light fixtures on pedestrian ramp / overcrossing, pedestrian walkway, and station platform: "Glow both up and down" to highlight the architecture

2) Other light fixtures: Full cutoff

4. Aesthetic character

a. Seamlessly integrate lighting equipment with architecture

1) Consider daytime appearance as well as nighttime lighting

b. Accentuate architectural forms

1) Consider halogen sources for accent light where highest possible color rendering is considered critical

c. Analyze lamp color to provide best possible color rendering of architectural materials and surfaces

1) Lamp color temperature: 3000 K

d. Use a limited number of types of lamps and fixtures for perceptual unity

5. Durability and economy

a. Vandal resistant
b. Durable
c. Low maintenance
d. Standard and easily manipulated equipment
e. Equipment and lamps of few types for ease of maintenance
f. Design life of lamps

1) Induction lighting (lamp life 100,000 hours) required at bus platform and elevator landing
2) Light-emitting diode (LED) lighting (lamp life 50,000 hours) required at stairs, except emergency exit stairs
3) Compact fluorescent or metal halide (lamp life 20,000 hours) acceptable elsewhere

6. Safety

a. UL listed and rated for wet locations
b. NFPA 70, National Electrical Code
c. California codes

7. General

    a. Fixtures of quality equivalent to or better than those indicated on drawings
    b. Provide fixtures with all lamps, completely wired, controlled, and securely attached to supports
    c. Warranted free of defects and fully operational for one year after Final Acceptance; repaired or replaced at no cost to Metro
    d. Adequate and sturdy supports
    e. Verify locations and spacing in field with designer
    f. Review existing circuiting; verify new loads and panel capacity; notify Metro of conflicts between design documents and field conditions
    f. Connect fixtures to lighting panel via lighting control panel

D. Quality assurance and quality control

1. UL
2. NFPA 70

E. Submittals

1. Product data
2. Photometric analysis, including mapping
3. Spare lamping equal to 10% of items supplied
4. Special tools required to maintain and service fixtures

70.08 Structure Communications

A. Elements

1. Telephone: Passenger assistance (Metro information), P-tel
2. Telephone: Emergency, E-tel
3. Telephone: Public pay phone
4. Public address system
5. Variable message signs
6. Steel conduit
7. Fiberoptic cable (voice, video, and data) at buildings and other structures
8. Cabinets as required
9. For site main fiberoptic cable and associated work, see Specifications 30.08, Site Communications
10. For fixed message signs see Specifications 80.02, Signage and Wayfinding

B. Standards

1. Metro BRT standards

    a. BRT Design Criteria

        1) Section 9, Systems
        2) 3.5.14, Corrosion Control

    b. BRT Architectural Standard Drawings

2. Metro signage standards

    a. Metro Graphic Standards
    b. Materials and Fabrication Standards
    c. Metro Liner

3. California codes
4. Metro typical electrical/communications requirements

    a. Provided in Volume IV of the Project Definition Documents – Technical
    b. Disregard project-specific references

C. Performance and other requirements

1. Per Metro typical electrical/communications requirements

    a. Prepare Project Specifications of similar scope and content
    b. Comply with referenced standards

2. Provide conduit and cable for CCTV cameras in elevator cabs

D. Quality assurance and quality control

1. Per Metro typical electrical/communications requirements
2. Metro Creative Services Department to approve designs, graphics, and types, quantities, and locations of components

E. Submittals

1. Per Metro typical electrical/communications requirements
2. Metro Creative Services Department to approve designs, graphics, and types, quantities, and locations of components

70.09 Structure Fire Alarm

A. Elements

1. Heat detector at elevator machine room
2. Pull station at upper elevator landing
3. Pull station at lower elevator landing
4. Connection to existing fire alarm control panel (FACP) at Union Station
5. Other as required for the Work

B. Standards

1. California codes
2. City of Los Angeles

C. Performance and other requirements

1. Per applicable standards

D. Quality assurance and quality control

1. California State Fire Marshal (SFM) listing
2. UL listing
3. FM approval

E. Submittals

1. Product data for heat detector and pull stations
2. System plan showing devices, wiring, and connection to FACP

70.10 Structure Security

A. Elements

1. Closed-circuit television (CCTV)
2. Intrusion detection

B. Standards

1. California codes

   a. California Electrical Code
   b. Cal/OSHA

2. City of Los Angeles
3. Metro BRT Design Criteria

   a. Section 9, Systems
   b. 3.5.14, Corrosion Control

4 NFPA, National Fire Protection Association

   a. NFPA 70, National Electrical Code

5. Metro typical electrical/communications requirements

   a. Provided in Volume IV of the Project Definition Documents – Technical
   b. Disregard project-specific references

C. Performance and other requirements

1. Compatible with Metro systems
2. Security cameras

   a. Pan-to-zoom (PTZ) cameras
   b. Non-PTZ cameras

3. Per Metro typical electrical/communications requirements

   a. Prepare Project Specifications of similar scope and content
   b. Comply with referenced standards

4. Provide CCTV at Universal Fare System equipment and gates and elsewhere as required by Metro

5. Provide intrusion detection at emergency access stairway gates

    a. Requirements to be developed by Contractor in cooperation with Metro and in consultation with security consultant
    b. Integrated with CCTV system

D. Quality assurance and quality control

1. Contractor to develop detailed Project Specification for Metro approval, including quality assurance and quality control provisions
2. For electrical work comply with Metro typical electrical/communications requirements
3. Compliant with applicable UL standards

E. Submittals

1. Per Metro typical electrical/communications requirements

DIVISION 80 – EQUIPMENT AND FURNISHINGS

80.01 Site Furniture

A. Elements

1. Waste receptacles
2. Benches, ADA
3. Benches, non-ADA

B. Standards

1. Metro BRT Standards

    a. Metro BRT Architectural Standard Drawings, Sheets AS-008 and AS-010

2. Accessibility standards

C. Performance and other requirements

1. Per Metro BRT standards

D. Quality assurance and quality control

1. Per Metro BRT standards

E. Submittals

1. Product data
2. Color selections
3. Shop drawings

80.02 Signage and Wayfinding

A. Elements

1. Fixed message signs
2. Map cases
3. Bus bay pylons
4. For variable message signs see Specifications 70.08, Structure Communications
5. For telephones see Specifications 70.08, Structure Communications
6. For public address system see Specifications 70.08, Structure Communications
7. For iconic canopy signage see Specifications 80.03, Iconic Canopy Signage

B. Standards

1. Metro signage standards

    a. Metro Graphic Standards
    b. Materials and Fabrication Standards
    c. Metro Liner

2. Metro BRT standards

    a. BRT Design Criteria

        1) Section 6.9, Signage and Graphics

    b. BRT Architectural Standard Drawings

3. California codes
4. Accessibility standards
5. SCAQMD
6. ASTM, ASTM International, www.astm.org/standards

    a. ASTM B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
    b. ASTM B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
    c. ASTM B211, Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire
    d. ASTM B308, Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles
    e. ASTM A666, Standard Specification for Annealed or Cold-Worked Stainless Steel Sheet, Strip, Plate, and Flat Bar

f. ASTM A480, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
g. ASTM A554, Standard Specification for Welded Stainless Steel Mechanical Tubing
h. ASTM A276, Standard Specification for Stainless Steel Bars and Shapes
i. ASTM A484, Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings
j. ASTM A555, Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods
k. ASTM A312, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
l. ASTM F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
m. ASTM F594, Standard Specification for Stainless Steel Nuts
n. ASTM E527, Standard Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

7. AAMA, American Architectural Manufacturers Association, www.aamanet.org

   a. AAMA 2605, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels

      1) AAMA 2604 (High Performance) is not acceptable
      2) Minimum 70% fluorocarbon content
      3) Longest commercially available warranty period

8. AA, Aluminum Association, www.aluminum.org

   a. Aluminum Design Manual

9. AWS, American Welding Society, www.awspubs.com/

   a. AWS D1.6, Structural Welding Code—Stainless Steel

10. SSINA, Specialty Steel Industry of North America, www.ssina.com

    a. Design Guidelines for the Selection and Use of Stainless Steel
    b. Specifications for Stainless Steel
    c. Stainless Steel Fasteners: A Systematic Approach to Their Selection
    d. Stainless Steel Fabrication
    e. Stainless Steel Architectural Facts
    f. Standard finishes: Online data at www.ssina.com

g. Special Finishes for Stainless Steel (if applicable)

11. IMOA, International Molybdenum Association, www.imoa.info/moly_uses/moly_grade_stainless_steels/architecture/selection_system.html

a. Stainless Steel Evaluation System
b. Which Stainless Steel Should Be Specified for Exterior Applications

12. NAAMM, National Association of Architectural Metal Manufacturers, www.naamm.org

a. Metal Finishes Manual for Architectural and Metal Products

C. Performance and other requirements

1. Integrate signage and wayfinding with electronic-based communications as specified in other sections

a. See Preliminary Engineering Drawings for combination of fixed signage and electronic communication in fixtures

2. Durability and maintainability

a. Of materials and design to resist vandalism, incidental damage, and wear
b. Able to be repaired and refinished without marring or loss of visual continuity
c. Suitable for lack of washing and other maintenance without loss of appearance or durability

3. Resistance to corrosion

a. Of materials and design to prevent pitting and other corrosion under conditions of use (including urban pollution, industrial pollution, vehicle exhaust and contaminants, climate, and horizontal surfaces, assuming no washing maintenance) under IMOA guidelines
b. Assume acid rain conditions per Sections 2.2.2 and 2.2.6 of the Metro BRT Design Guidelines, meaning that standard metals and finishes are subject to premature oxidation or deterioration
c. Materials will be subject to continuous exterior exposure to sun, rain, humidity, condensation, and wind
d. Components will be subject to movement
e. Select top quality materials specifically formulated to not corrode under these conditions

4. Aesthetics

   a. Uniform appearance and unified design
   b. Free of blemishes, marks, discoloration
   c. Produced to highest commercial standard for flatness
   d. Without deflection or oil canning
   e. Edges and corners smooth, sharp and true to angle or curvature
   f. Welds continuous, matching in color and grain, and ground flush and smooth
   g. Concealed fasteners
   h. Panels formed from single sheets without splice joints
   i. No visual defects when viewed from 3 feet at 100 foot-candles

5. Materials

   a. Stainless steel

      1) Austenitic (300 series) stainless steel
      2) Type 316 or Type 317
      3) Comply with referenced standards
      4) Mechanical finishes

         a) Standard polished finish, No. 4 brushed; cleaned and passivated, ASTM A380
         b) Polished using only silicon carbide abrasives for corrosion resistance, using fine grit for smoothness
         c) Surface roughness: Roughness average ($R_{a)}$ lowest commercially available to reduce corrosion
         d) Grain orientation (where applicable): Vertical to facilitate contaminant removal

   b. Aluminum

      1) Of alloy with excellent corrosion resistance under conditions of use
      2) With smooth mechanical finish for best corrosion resistance
      3) With 70% fluoropolymer AAMA 2605 applied finish coating offering longest warranty commercially available

   c. Paint

      1) High-solids aliphatic two-component polyurethane coating
      2) Suitable for exterior applications on both metal and plastic
      3) SCAQMD VOC compliant
      4) Resistant to solvents, chemicals, stains, humidity, salt spray, and impact

5) Graffiti-resistant
6) Standard of quality: Cardinal Industrial Finishes, 6400 Series High Solids Polyurethane, anti-graffiti formulation, or equal
7) Colors as approved by Metro

d. Reflective vinyl film

1) Standard of quality: Gerber Scientific Products, Gerber Series 280i Reflective Sheeting or equal

e. Plastic signs

1) Highly resistant to chemicals, graffiti, vandalism, and weather
2) Standard of quality: Visual Marking Systems, TransGrafix family or equal

D. Quality assurance and quality control

1. Per Metro signage standards
2. Metro Creative Services Department to approve designs, graphics, and types, quantities, and locations of components
3. Metro Engineering Department to approve mounting of components

E. Submittals

1. Product data
2. Shop drawings
3. Mock-ups
3. Other per Metro signage standards

80.03 Iconic Canopy Signage

A. Elements

1. Large, iconic signage atop bus platform canopy
2. "Union Station" letter-forms on individual panels
3. "Metro" and "M" logo
4. "Patsaouras Transit Plaza"

B. Standards

1. Metro signage standards

    a. Metro Graphic Standards
    b. Materials and Fabrication Standards
    c. Metro Liner

2. Metro iconic canopy signage exhibits
3. California codes
4. For standards for materials and finishes, see Specifications 80.02, Signage and Wayfinding
6. For standards for durability and maintainability, resistance to corrosion, and aesthetics, see Specifications 80.02, Signage and Wayfinding

C. Performance and other requirements

1. All signs

    a. Designed to be seen at freeway speeds and at great distances
    b. Double-sided
    c. Internally illuminated
    d. Located atop station platform canopy with sign posts aligned with canopy supports and underlying below-deck canopy columns and foundations
    e. Metal materials: Powdercoated steel
    f. Light fixture and lamp types: Submit proposed products for Metro approval

2. "Union Station" signage

    a. Individual letter-forms back-to-back on 13 individually mounted panels (12 letters plus one blank panel for letter space)
    b. Panel faces: Solid powdercoated steel, approximately 5 feet high, with larger panels at first and last letters of sign
    c. End panels: Powdercoated perforated metal

3. "Metro" and "M" logo signage

    a. "M" letter-form on circular panel approximately 10 feet in diameter
    b. "Metro" rectangular sign mounted beneath

4. "Patsaouras Transit Plaza" signage

    a. Long rectangular sign mounted beneath "Union Station" signage
    b. "Metro" rectangular sign mounted beneath

5. Coordinate with structural, electrical, and other disciplines

D. Quality assurance and quality control

1. Per Metro signage standards
2. Metro Creative Services Department to approve designs, graphics, and types, quantities, and locations of components
3. Metro Engineering Department to approve mounting of components

E. Submittals

1. Proposed designs
2. Product data
3. Shop drawings
4. Mock-ups
5. Other per Metro signage standards

80.04 Universal Fare System (UFS) Provisions

A. Elements

1. Provisions for future ticket vending machines (TVM)
2. Provisions for future stand-alone validators (SAV)
3. Provisions for future fare gates and emergency swing gates
4. For telephones and public address system, see Specifications 70.08, Structure Communications
5. For variable message signs, see Specifications 70.08, Structure Communications
6. For fixed message signs, see Specifications 80.02, Signage and Wayfinding

B. Standards

1. Metro BRT standards

    a. BRT Design Criteria, Section 9, Systems
    b. BRT Architectural Standard Drawings

2. Metro rail standards

    a. Metro Rail Design Criteria, Section 9, Systems

C. Performance and other requirements

1. Determine final locations of future UFS equipment (TVMs, SAVs, fare gates) in cooperation with Metro

    a. Locations shown on drawings in Volume III of Project Definition Documents – Technical are preliminary only

2. Provide fiberoptic cable (voice, video, and data) and conduit to locations of future UFS equipment
3. Provide electrical power and conduit to locations of future UFS equipment
4. Provide adequate cabinet or rack space for future UFS equipment
5. Design installation to accommodate future components that will be required when UFS equipment is installed
6. Stub out and conceal

    a. Aesthetically compatible with adjacent work
    b. Secure and vandal-resistant

7. Comply with Specifications 70.06, Structure Electrical, and 70.08, Structure Communications

D. Quality assurance and quality control

1. Metro approval of terminations and concealment

E. Submittals

1. Details
2. Product data

80.05 Fire Extinguishers and Cabinets

A. Elements

1. Portable fire extinguishers
2. Fire extinguisher cabinets

B. Standards

1. NFPA, www.nfpa.org/aboutthecodes/list_of_codes_and_standards.asp

    a. NFPA 10, Standard for Portable Fire Extinguishers

2. UL, Underwriters Laboratories

    a. Online Certifications Directory, at database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.html
    b. UL 299, Dry Chemical Fire Extinguishers, available at ulstandardsinfonet.ul.com/scopes

3. California codes
4. City of Los Angeles

    a. Los Angeles Fire Department (LAFD)

C. Performance and other requirements

1. For Class A, B, and C fire types
2. Extinguishing agent: Multipurpose dry chemical
3. Extinguisher style: Stored-pressure (rechargeable)
4. Heavy duty cabinet
5. Capacities, locations, and possibly other types as required per LAFD and California codes

D. Quality assurance and quality control

1. UL labeled and listed
2. Quality standard: Manufactured by J. L. Industries, Larsen's Manufacturing Company, Potter Roemer, or equal

E. Submittals

1. Product data
2. Shop drawings
3. Samples

4. Operation and maintenance data
5. LAFD approval

80.06 Public Art

A. Elements

1. Tasks

a. Coordinate with Metro and artist
b. Participate in planning of artwork and installation
c. Incorporate artwork into design and construction documents
d. Prepare a plan for installation of artwork
e. Schedule installation of artwork
f. Receive, store, and protect artwork components
g. Install artwork
h. Protect artwork after installation

2. Artwork components

a. Artwork panels on pedestrian ramp / overcrossing and pedestrian walkway – "wind bridge"
b. Design varies with location
c. Aluminum panels that move in the wind

1) 10" square
2) Perforated aluminum
3) Stainless steel hinges
4) Metro furnishes these

d. Interior membrane of continuous perforated metal

1) Protects art from pedestrians
2) Creates shade for pedestrians
3) May or may not replace portions of enclosure under Specifications 60.02, Canopies, Pedestrian Enclosures, and Railings
4) Contractor furnishes this

e. Hardware and installation by Contractor
f. Design, configuration, and installation methods to be determined during final design

B. Standards

1. California codes
2. Metro BRT standards

C. Performance and other requirements

1. Coordinate with public art team in Metro Creative Services Department ("Metro Art")

    a. As required to implement the public art component of the project

2. Participate in planning of artwork and installation

    a. Throughout artwork design, project design, and into project construction
    b. Participate in meetings as needed
    c. Actively contribute to development of appropriate design, materials, and attachment methods compatible with the rest of the Work

3. Incorporate artwork into design and construction drawings and specifications

    a. Identify as "Furnished by Metro and installed by Design/Build Contractor"
    b. Coordinate with other Work including architectural, structural, electrical, lighting, etc.

        1) Artist will submit signed structural drawings and calculations

    c. Include Metro Art in review process

        1) For all review/comment processes on design and construction documents
        2) For all submittals until completion and approval of Approved for Construction documents
        3) For construction submittals, requests for information, shop drawings, and changes having any bearing on artwork

    d. Prepare a plan for installation of artwork

        1) To include:

            a) Installation methodology and attachments
            b) Constructability
            c) Safety and security
            d) Code requirements
            e) Engineer's report

        2) Plan to be reviewed by Metro Art and revised as necessary for Metro Art approval

e. Schedule installation of artwork

1) Coordinate with Metro Art
2) Give Metro Art 6 months' advance notice requesting confirmation of delivery date for artwork
3) Metro Art will provide delivery date
4) Give timely advance notice, at least 14 days, for schedule revisions

f. Receive, store, and protect artwork components

1) Receive and offload
2) Provide safe and secure storage under appropriate environmental conditions
3) Protect from damage or loss
4) Bear cost of replacement and associated schedule delays until Final Acceptance

g. Install artwork under approved plan and schedule

1) Install panels designed and fabricated by artist and furnished by Metro
2) Furnish and install interior membrane of perforated metal
3) Furnish and install hardware for panels and membrane
4) At completion, review and correct Metro Art punchlist items

h. Protect artwork after installation

1) Cover and protect using methods jointly determined with Metro Art
2) Maintain protection until Final Acceptance

D. Quality assurance and quality control

1. Installation oversight by Metro Art

E. Submittals

1. Design and construction documents incorporating artwork
2. Product data for components furnished by Contractor
3. Shop drawings for components furnished by Contractor

80.07 Other Equipment and Furnishings

A. Elements

1. Concrete-filled steel bollards on platform
2. Ladder at elevator pit
3. Safety harness anchors
4. Other as required

B. Standards

1. Caltrans standards
2. American Ladder Institute, ALI/ANSI A14.3, Ladders—Fixed—Safety Requirements, available at webstore.ansi.org
3. OSHA Standard, Ladders, 29 CFR Part 1926.1053, available at www.osha.gov under Regulations
4. California codes

C. Performance and other requirements

1. Pipe bollards

   a. Fabricate from Schedule 40 steel pipe
   b. Galvanize, ASTM A123, ASTM A153 for hardware
   c. Anchor in concrete in formed or core drilled holes 3/4" wider than diameter of bollard
   d. Grout annular space with nonshrink, nonmetallic grout
   e. Fill solidly with concrete, mounding top surface
   f. Set in true vertical position

      1) On elevated slab: Provide 4" diameter heavy weight steel pipe welded to 6" x 6" x 1/4" thick steel plate with four 3" studs 1/2" from each corner with 12" No. 4 rebar welded each way

   g. Paint with coating system and color approved by Metro

2. Ladders

   a. Extra heavy duty type

      1) Duty rating: 375 lb. or more

   b. Clear width between rails: 16 inches or more
   c. Rung spacing: 12 inches
   d. Rails: Approx. 2" x 2" if plastic; 2-1/2" x 1/2" if metal
   e. Rungs: Nonslip (aluminum oxide granules), non-turning if round

f. Anchorage: Welded or bolted stainless steel; set off from wall 5" or more with standoff clips; anchored to wall at top, bottom, and at spacing as required to support loads, and anchored to floor
g. Material: Fiberglass-reinforced plastic

3. Safety harness anchors

a. Provide where worker access will be required at locations 8 feet or more above grade or floor
b. Comply with Cal/OSHA requirements

D. Quality assurance and quality control

1. Ladders labeled for compliance and duty rating

E. Submittals

1. For ladders: Product data, installation instructions, shop drawings
2. For bollards: Construction details
3. For safety harness anchors: Product data, installation instructions, shop drawings

APPENDICES

Appendix A	List of Mandatory Requirements and Non-Mandatory Reference Information
Appendix B	Table of Contents of Volume IV, Project Definition Documents – Technical Documents: Technical Reports, Mandatory Requirements, and Non-Mandatory Reference Information

APPENDIX A TO VOLUME II - SPECIFICATIONS

LIST OF MANDATORY REQUIREMENTS AND NON-MANDATORY REFERENCE INFORMATION
PROJECT DEFINITION DOCUMENTS – TECHNICAL DOCUMENTS

Item No.	Volume No.	Title	Mandatory Requirements	Non Mandatory Reference Information
1	I	General Requirements	All information is mandatory.	
2	II	Specifications	All information is mandatory.	
3	III	General Drawings (Drwg. Nos. T-01 to T-04)		All drawings are non-mandatory reference information.
4	III	Typical Section (Drwg. No. C-01	Lane configurations	Drawing is non-mandatory reference information, except as noted.
5	III	Layout Sheets (Drwg. Nos. C-02 to C-04)	Horizontal geometry; bus platform location and width	All drawings are non-mandatory reference information, except as noted.
6	III	Busway Bridge Profile (Drwg. No. C-05)		Drawing is non-mandatory reference information.
7	III	Construction Details (Drwg. Nos. C-06 & C-07)	Granite curb and Type 60GA Barrier	All drawings are non-mandatory reference information, except as noted.
8	III	Drainage Drawings (Drwg. Nos. C-08 & C-09)	Permanent BMP Austin Sand Filter	All drawings are non-mandatory reference information, except as noted.
9	III	Utility Drawings (Drwg. Nos. C-10 & C-11)		All drawings are non-mandatory reference information.
10A	III	Pavement Delineation Drawings (Drwg. Nos. C-12 to C-15)	Lane configurations (including buffer lanes) and lane transitions	All drawings are non-mandatory reference information, except as noted.
10B	III	Right of Way Exhibit (Drwg. No. C-16)		Drawing is non-mandatory reference information.

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Item No.	Volume No.	Title	Mandatory Requirements	Non Mandatory Reference Information
11	III	Traffic Handling Plans (Drwg. Nos. TH-01 to TH-05)		All drawings are non-mandatory reference information.
13A	III	Architectural Drawings (Drwg. Nos. A-01 to A-17)	All drawings are mandatory requirements, except as noted	• Column locations, size and spacings for Pedestrian Walkway, Pedestrian Ramp / Overcrossing, Platform Canopy, and stairs. • Canopy, Pedestrian Walkway, and Pedestrian Ramp / Overcrossing heights (overall heights will be controlled by minimum clearances to signs). • Spacings of benches, map cases hose bibs, and trash receptacles along platform length. • Spacings of metal support frames. • Drainage details. • Control joint locations. • Locations of future fare vending equipment, ticket validators, and gating.
13B	III	Structural Plans (Drwg. Nos. S-01 to S-18)	No driven piling or driven casings / shells	All drawings are non-mandatory reference information, except as noted.

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Item No.	Volume No.	Title	Mandatory Requirements	Non Mandatory Reference Information
14	III	Electrical Drawings (Drwg. Nos. E-00 to E-08)		All drawings are non-mandatory reference information.
15	III	Signage and Wayfaring Drawings (Drwg. Nos. SW-01 to SW-06)	All drawings represent minimum and mandatory requirements	
16	III	Universal Fare System and Gating Drawings (Drwg. Nos. F-01 and F-02)	Number of future TVMs, SAVs, and number of locations for gating. Final locations of all items to be coordinated and approved by Metro during final design	All drawings are non-mandatory reference information, except as noted.
17	IV	BRT Design Criteria	Items cited in Specifications or on Drawings	All information is non-mandatory reference information, except as noted.
18A	IV	Metro BRT Architectural and Structural Standards	All information is mandatory	
19	IV	Metro BRT Supplemental Sustainability Design Criteria (SSDC) Guideline	All information is mandatory	
20	IV	Metro Freeway Supplemental Sustainability Design Criteria	All information is mandatory	
21	IV	Metro Rail Transit Design Criteria and Standards	Items cited in Specifications or on Drawings	All information is non-mandatory reference information, except as noted.

APPENDIX A TO VOLUME II - SPECIFICATIONS

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PROJECT DEFINITION DOCUMENTS – TECHNICAL DOCUMENTS

Item No.	Volume No.	Title	Mandatory Requirements	Non Mandatory Reference Information
22A	IV	Metro Signage Standards	All information is mandatory	
22B	IV	Metro Iconic Canopy Signage Exhibits	All information is mandatory	
23	IV	Advanced Planning Study Drawings		All information is non-mandatory reference information.
24	IV	Preliminary Foundation Report		All information is non-mandatory reference information.
25	IV	Draft Bridge Site Data Submittal		All information is non-mandatory reference information.
26	IV	Project Study Report / Project Report	All information is mandatory	
26A	IV	Modified Access Report		All information is non-mandatory reference information.
27	IV	Traffic Operations Analysis Report		All information is non-mandatory reference information.
28	IV	Storm Water Data Report (PA/ED Submittal)		All information is non-mandatory reference information.
29	IV	Artwork Exhibits		All information is non-mandatory reference information.
30	IV	Original Design Plans: Metro Parking Garage		All information is non-mandatory reference information.
31	IV	As-Built Plans: Metro Red Line Tunnels		All information is non-mandatory reference information.

APPENDIX A TO VOLUME II - SPECIFICATIONS

LIST OF MANDATORY REQUIREMENTS AND NON-MANDATORY REFERENCE INFORMATION
PROJECT DEFINITION DOCUMENTS – TECHNICAL DOCUMENTS

Item No.	Volume No.	Title	Mandatory Requirements	Non Mandatory Reference Information
32	IV	As-Built Plans: Los Angeles River Busway Bridge and Overhead (Bridge No. 53-2673)		All information is non-mandatory reference information.
33	IV	As-Built Plans: Los Angeles River Busway Bridge (Widen)		All information is non-mandatory reference information.
34A	IV	Environmental Documents: NEPA and CEQA Reports	All information is mandatory	
34B		Construction Traffic Impact Review – Union Station / Patsaouras Plaza Busway Station Project		All information is non-mandatory reference information.
35	IV	Existing As-Built Utility Drawings		All information is non-mandatory reference information.
36	IV	Master Cooperative Agreement between Metro and Caltrans		All information is non-mandatory reference information.
37	IV	Master Cooperative Agreement between Metro and City of Los Angeles		All information is non-mandatory reference information.
38A	IV	Preconstruction ROW Parcel Exhibits		All information is non-mandatory reference information.
38B	IV	Preconstruction Record of Survey		All information is non-mandatory reference information.

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PROJECT DEFINITION DOCUMENTS – TECHNICAL DOCUMENTS

Item No.	Volume No.	Title	Mandatory Requirements	Non Mandatory Reference Information
39	IV	Metro Typical Electrical/ Communications Requirements		All information is non-mandatory reference information.
40	IV	Cultural Resources Monitoring and Discovery Plan for the Union Station / Patsaouras Plaza El Monte Busway Station Project		All information is non-mandatory reference information.
41	IV	Geotechnical and Environmental Investigation Report (TRC)		All information is non-mandatory reference information.
42	IV	Existing Utilities Matrix (TRC)		All information is non-mandatory reference information.

APPENDIX B TO VOLUME II - SPECIFICATIONS

TABLE OF CONTENTS
VOLUME IV OF THE PROJECT DEFINITION DOCUMENTS – TECHNICAL DOCUMENTS

Technical Reports, Mandatory Requirements, and Non-Mandatory Reference Information

Note: Volume IV is a collection of electronic files placed on a CD (not a printed document).