

SYSTEMWIDE BASELINE CHANGE NOTICE (SBCN)

DOCUMENT/TITLE/NUMBER/REVISION:

Revise:

MRDC Section 6 – Architectural Revision 9 and BRT DC Section 6 – Architectural Revision 2
 MRDC Section 9 – Systems Revision 12 and BRT DC Section 9 Systems Revision 2
 MR Architectural Standards and BRT Architectural Standards
 MR Architectural Directives
 MR Electrical Directives

CHANGE IMPACT ASSESSMENT SUMMARY: (Attach written explanation of impacts identified)

SCHEDULE ISSUES?:	N	OTHER DOCUMENT REVISIONS REQUIRED?:	
ROM (RANGE):	NO COST	DESIGN ISSUES?:	N
TIME IMPACT:	N/A	SAFETY ISSUES?:	N
CAL DAYS	N/A	THIRD PARTY?:	N

Related Request(s)-For-Change: **NONE**

JUSTIFICATION (including benefit or impact if not pursued):

This SBCN is in response to MTA Board Box Item dated 11/13/14 which directed the removal of public telephones for current and future rail systems, and to revise the MRDC, Directive Dwgs, and Standard Plans accordingly.

MRDC Section 6: Table 6.1, 6.5.4.A, 6.16.3.C, 6.16.4.C
 BRT Section 6: Table 6.1.1-1 and 6.4.4
 MRDC Section 9: 9.7.1.B and F, 9.7.9
 BRT Section 9: 9.3.1.A, 9.3.2.G, 9.5.1, 9.5.6
 MR Arch Directives: AD-000 (Rev. 7) AD-004 (Rev. 3), AD-015 (Rev. 2)
 MR Arch Standards: AS-000 (Rev. 13), AS-000A (Rev. 1), AS-014 (Rev. 5), AS-040 (Rev. 1), AS-041 (Rev. 1), AS-043 (Rev. 1), AS-048 (Rev. 1), AS-051 (Rev. 1), AS-060 (Rev. 1)
 BRT Arch Standards: AS-000 (Rev. 5), AS-001 (Rev. 3), AS-002 (Rev. 5), AS-003 (Rev. 4), AS-014 (Rev. 5)
 MR Electrical Directives: ED-000 (Rev. 1) ED-003 Rev. 1, ED-004 Rev. 1, ED-502 Rev. 1

PROJECTS/CONTRACTS AFFECTED: For new projects only

PROJ CONTRACT	CN #	ACTION STATUS	ROM ESTIMATE
TOTAL ESTIMATED CHANGE COST: (DIRECT)			\$0.00
TOTAL ESTIMATED CHANGE COST: (INDIRECT: POTENTIAL COST RECOVERY)			
TOTAL ESTIMATED CHANGE COST: (INDIRECT+ DIRECT)			\$0.00

RECOMMENDATION AND APPROVAL SIGNATURES: (R = RECOMMEND, A = APPROVE)

RTG	APPROVAL	TITLE	NAME	SIGNATURE	DATE
R	REQUESTOR		A. DAVIDIAN		01/12/15
R	DIRECTOR CONFIGURATION MANAGEMENT		D. CURZON		1/12/15
R	DIRECTOR PROJ. ENG. FACILITIES		N/A		
R	DEO, PROJ. ENG. SYSTEMS		M. RATNASINGHAM		01/14/15
R	DIRECTOR QUALITY MANAGEMENT		C. DAVIS (INTERIM)		1/20/15
R	EXECUTIVE DIRECTOR, RAIL OPERATIONS		B. SHELburne		1-20-15
R	EO, PROJECT ENGINEERING		S. MAYMAN		1/21/15
A	EXECUTIVE DIRECTOR ENGRG. AND CONSTRUCTION		B. PENNINGTON		1/26/15

METRO RAIL DESIGN CRITERIA

SECTION 6

ARCHITECTURAL

TABLE OF CONTENTS

	PAGE
6.1 CRITERIA	1
6.1.1 Introduction	1
6.1.2 Definitions	7
6.1.3 Reference Data	9
6.1.4 Not Used	10
6.1.5 Station/Platform Sizing	10
6.1.6 Design Guidelines	10
6.2 ADVERTISING	23
6.2.1 Introduction	23
6.2.2 Basic Goals	24
6.2.3 Criteria	24
6.2.4 Standard Advertising Panel for Underground Stations	24
6.3 ARTWORK	24
6.3.1 Introduction	24
6.3.2 Basic Goals	25
6.3.3 General Principles - General Guidelines	25
6.3.4 Donor Program	26
6.3.5 Artist and Architect Collaboration	26
6.4 CODES	27
6.4.1 Introduction	27
6.4.2 Basic Goal	27
6.4.3 Applicable Codes and Standards	27
6.5 CONCESSIONS	28
6.5.1 Introduction	28
6.5.2 Basic Goals	28
6.5.3 Design Criteria	28
6.5.4 Specific Criteria	29
6.6 LANDSCAPING	29
6.6.1 Introduction	29
6.6.2 Objectives	30
6.6.3 Coordination	31
6.6.4 Design Criteria	31
6.7 MATERIALS	36
6.7.1 Introduction	36
6.7.2 Basic Goals	36
6.7.3 General Criteria	38
6.8 TOILET AND DRAINAGE SYSTEMS	49
6.8.1 Introduction	49
6.8.2 Basic Goals	49
6.8.3 Staff Toilet	49
6.8.4 Toilet Fixtures and Trim (See Directive Drawings)	50
6.8.5 Toilet Room Accessories	50
6.8.6 Drinking Fountain	50
6.8.7 Drainage in Stations	50
6.9 SANITATION AND MAINTENANCE	51
6.9.1 Introduction	51
6.9.2 Basic Goals	51
6.9.3 General Principles	52

	6.9.4	Specific Requirements	53
6.10		SIGNAGE AND GRAPHICS	55
	6.10.1	Introduction	55
	6.10.2	Basic Goals	56
	6.10.3	Definitions	56
	6.10.4	General Requirements	56
	6.10.5	Signage System	57
6.11		STATION CONTROL	57
	6.11.1	Introduction	57
	6.11.2	Basic Goals	57
	6.11.3	Planning Considerations.....	57
	6.11.4	Rail Operations Control (ROC)	58
	6.11.5	Staff/Security Room in Underground Station	59
	6.11.6	Fare Gates and Fences (See Section 9.2 Fare Gate)	59
	6.11.7	Station Closedown.....	59
	6.11.8	Private Entrances	60
	6.11.9	Security Alarms and Locks.....	60
	6.11.10	Security Areas.....	61
6.12		PEDESTRIAN CIRCULATION, PARKING FACILITIES, AND SITEWORK.....	63
	6.12.1	Introduction	63
	6.12.2	Basic Goals	63
	6.12.3	Priority Access Modes	63
	6.12.4	Pedestrian Access	64
	6.12.5	Bicycle Access.....	65
	6.12.6	Vehicular Access	70
	6.12.7	Bus Facilities.....	70
	6.12.8	Kiss-and-Ride Facilities	70
	6.12.9	Park-and-Ride Facilities	71
	6.12.10	Facilities for the Elderly and Disabled	72
6.14		VERTICAL CIRCULATION	74
	6.14.1	Introduction	74
	6.14.2	Basic Goals	74
	6.14.3	Station Layout Requirements.....	75
	6.14.4	Stairs for Underground and Aboveground.....	75
	6.14.5	Pedestrian Ramps	77
	6.14.6	Escalators.....	77
	6.14.7	Elevators.....	79
6.15		INTERCHANGE STATIONS	81
	6.15.1	Introduction	81
	6.15.2	Basic Goal	81
	6.15.3	Functional Criteria	81
6.16		PROVISIONS FOR INDIVIDUALS WITH DISABILITIES.....	82
	6.16.1	Introduction	82
	6.16.2	Codes and Standards	82
	6.16.3	Systemwide Criteria	83
	6.16.4	Stations.....	84
	6.16.5	Elements of Vertical Circulation.....	85
	6.16.6	Not Used	87
	6.16.7	Fare Collection.....	87
	6.16.8	Emergency Egress Provisions	88
	6.16.9	Operations and Maintenance (O&M) Facilities.....	88

TABLES

<u>Section</u>	<u>Table Number</u>	<u>Title</u>
6.1.1	6.1	Elements of Continuity/Variability
6.1.6	6.2	Metro Rail Stations Ancillary Space Requirements
6.1.6	6.3	Metro Rail Stations Minimum Queuing Requirements
6.7.4	6.4	Door, Hardware, and Security Schedule
6.11.10	6.5	Security Levels and Provisions
6.12.9	6.6	Number of Accessible Parking Spaces

FIGURES

<u>Section</u>	<u>Figure Number</u>	<u>Title</u>
6.7.3	6.1	Transient Air Pressures

- Attachment A – Bicycle Not used
- Attachment B – Not used
- Attachment C – Task List Elevators
- Attachment D – Task List Escalators

ARCHITECTURAL

6.1 CRITERIA

6.1.1 Introduction

This design criteria pertains to all station types, unless specifically identified otherwise as at-grade, aerial or underground. Elements discussed in this section include area requirements, design of platforms, amenities, artwork, signage, advertising, landscaping, platform access, guidelines for the selection of materials, general guidelines for use in the design of bus access, Kiss and Ride and Park and Ride facilities, stations and ancillary facilities. It includes space requirements; materials and finishes; standards for planning and construction.

This section contains a program for the stations, as described in the Table of Contents, Section 6.2 through 6.16. Any additional information will be provided, as needed, by Metro. The station design shall consider the three essential principles of aesthetics, function, and durability. The successful relationship among the three spheres of influences will create a transit facility which will enhance the experience pleasure of patrons, and the station will last long, aging gracefully. The Architectural design of the transit facility shall consider the design excellence as priority that will give pride to the community and the user. Good design will ensure customer satisfaction, and will increase ridership and efficiency of the transit system.

Each station shall be designed in accordance with its individual requirements including line location, patronage requirements, topographic and geologic configurations, economy of function, construction methods and surface interface requirements.

To establish an identity for the Metro Transit System as a whole, thus enabling patrons to find their way easily even in a station new to them, the Architectural design of the stations shall be standardized wherever possible. Therefore, design elements are divided into two classifications, Elements of Continuity and Elements of Variability, as they pertain to underground and aboveground stations. (See Table 6.1)

- A. The Elements of Continuity of the system are established for purposes of station identity, station design, functional consistency, and reduction of capital operations and maintenance costs.
- B. The Elements of Variability, as established define the areas wherein individual design within specified parameters is allowed as long as the overall station budget is maintained.
- C. The design of all elements should anticipate a service life that will minimize future replacement and maintenance.
- D. Considering the anticipated growth and longevity of the system, careful consideration must be given to station compatibility with proposed future development in the neighborhood of each station, and where applicable, future extensions and/or connecting line transfers.

Architectural identity shall be standard and compatible with the following station elements wherever possible: canopies, guardrails, floor and wall finishes, station furniture, plaza areas, and other related items. Signage and customer information graphics and communication materials shall be the same system-wide. Neighborhood culture and character shall be emphasized through artwork.

The Designer should become familiar with the general aspects of the entire system in order to determine how his individual project relates to the whole. It is essential that space design and equipment layout be maintained throughout the system for the convenience of the patrons. Operational and maintenance requirements and uniformity of design must be taken into consideration in order that each station functions with the greatest economy and efficiency.

TABLE 6.1

ELEMENTS OF CONTINUITY/VARIABILITY

C = ELEMENTS OF CONTINUITY

V = ELEMENTS OF VARIABILITY

N/A = NOT APPLICABLE

	UNDERGROUND STATION	ABOVEGROUND STATION
A. Procurement Items		
1. Information Devices, all signs/graphics, including		
Accessibility signs/graphics	C	C
Station Markers (Pylons)	C	C
System and Station Mapcases	C	C
Transit Information	C	C
Signing and Graphics, exterior and interior		
Directional	C	C
Identification	C	C
Regulatory	C	C
Variable Message Signs (VMS)	C	C
Customer	C	C
Transportation Passenger Information System (TPIS)	C	C
2. Vertical Circulation Devices		
Escalators	C	C
Elevators	C	C
Safety/Security Accessibility Signing	C	C
3. Communications and Train Control		
Public Address Speakers	C	C
Public Address Systems for the Hearing Impaired	C	C
Radiax Cable	C	C
Fire Phones	C	C
Emergency Telephones	C	C
Administrative Telephones	C	C
Patron Assistance Telephones	C	C
Patron Assistance for the Hearing Impaired	C	C
Maintenance Telephones	C	C
Public Telephones	C	C
Text Telephones	C	C
Edgelighting	C	N/A
Fare Gates Telephones	C	C
4. Station Control and Security		
Intrusion Alarms	C	C
CCTV Equipment	C	C
Station Fare Collection Control Unit	C	C
Command Post Panel (Underground stations)	C	N/A
Emergency Trip Station	C	N/A

TABLE 6.1 (Continued)

ELEMENTS OF CONTINUITY/VARIABILITY

C = ELEMENTS OF CONTINUITY

V = ELEMENTS OF VARIABILITY

N/A = NOT APPLICABLE

	UNDERGROUND STATION	ABOVEGROUND STATION
5. Fare Collection Equipment		
Ticket Vending Machines (TVMs)	C	C
Fixed Fences	C	C
Fare Gates	C	C
Emergency Exit Gates	C	C
Accessible Gates (for the Disabled)	C	C
Add Fare Machines	C	C
Stand Alone Validators (SAVs)	C	C
B. Materials, Building Components, and Fixtures Integral with Station Construction		
1. Site Development		
Plazas	C	C
Paving	C	C
Streets, Curbs, and Gutters (City Standards)	C	C
Walkways	C	C
Retaining Wall	C	C
Bollards, Bumpers	C	C
Handrails/Railings	C	C
Landscaping	V	V
Fences	C	C
Benches (for underground station)	V	-
Benches (for at-grade and aerial station platforms)	-	C
Benches (for plaza level underground aerial stations)	V	V
Trash Receptacles	C	C
Planters	V	V
Ash Receptacles	C	C
Lighting (pedestrian and vehicular)	C	C
Bicycle Racks/Lockers	C	C
Bus Bays	C	C
Station Entry Portal Configuration	C	N/A
Emergency Generator Enclosure	V	V
2. Station		
Platform Configuration	C	C
Station Canopy	C	C
Platform Seating	V (HRT, LRT)	C
Trash Receptacles	C	C
Ash Receptacles at Station Entrance	C	C
Public Address Speaker Housing	C	C
Fare Collection Equipment	C	C
Doors, Gates, and Hardware	C	C

TABLE 6.1 (Continued)

ELEMENTS OF CONTINUITY/VARIABILITY

C = ELEMENTS OF CONTINUITY

V = ELEMENTS OF VARIABILITY

N/A = NOT APPLICABLE

	UNDERGROUND STATION	ABOVEGROUND STATION
Floor, Wall, and Ceiling Finishes - (See Section 6.7.4 Materials)		
Public Areas	V	C
Hose Bibbs	C	C
Lighting Fixtures	C	C
Security Gates at Entry Portals	C	N/A
Acoustical Materials and Strip Space Details	V	V
Concourse Configuration	C	N/A
Smoke and Exhaust Enclosure	V	N/A
Railings/Handrails - Public Areas	C	C
Railings/Handrails - Emergency Exits	C	C
Linear Platform Edge	C	C
Stairs	C	C
Electrical Outlets	C	C
Platform Edge	C	C
Platform Service Gates	C	C
Fire Hose Cabinet	C	C
Emergency Telephone	C	C
Crowd Control Devices	C	C
Platform Barriers	C	C
Detectable Directional Tile	C	C
3. Ancillary Rooms		
Incoming Power Room	C	C
Train Control/Communication Rooms	C	C
Substations	C	C
Auxiliary Electrical Rooms	C	C
Battery Room	C	N/A
Miscellaneous Auxiliary Rooms	C	C
Toilet Room - Fixtures, Accessories, Materials	C	C
Drinking Fountains	C	C
Custodial Rooms	C	N/A
Trash Room	C	N/A
Staff Room	C	N/A
Fan Rooms	C	N/A
Storage Rooms	C	C
Utility Boxes	C	C
Doors and Hardware	C	C
Ejector Room	C	N/A
Sump Room	C	N/A
Elevator Machine Room	C	C (aerial station)
Mechanical Grates, Louvers, and Grilles	C	C

TABLE 6.1 (Continued)
ELEMENTS OF CONTINUITY/VARIABILITY

C = ELEMENTS OF CONTINUITY
V = ELEMENTS OF VARIABILITY
N/A = NOT APPLICABLE

	<u>UNDERGROUND STATION</u>	<u>ABOVEGROUND STATION</u>
C. Air Distribution Systems	C	N/A
D. Artwork	V	V
E. Advertising	V	V

6.1.2 Definitions

Aboveground Station. A station in which the tracks and platform are either located on an aerial structure or rest directly on-grade.

Artist. An individual or team contracted to provide art design services and/or to produce artwork. Artists may collaborate with the Preliminary Engineer/Designer to develop integrated artwork or may develop stand-alone artwork. Artist participation is managed by Metro Art.

Aerial Structures. A structure, other than a culvert, which carries transit tracks and spans above land or water surfaces.

Architect. Individual or firm who is responsible for station architectural design.

Continuing Preliminary Engineering. Refinement of the Preliminary Engineering Documents by the Designers. During this phase, each discipline will clearly define all systems, materials, quantities, qualities, sizes, finishes, etc.

Designer. An Engineering firm contracted by Metro to provide engineering services on Metro Rail Projects.

Design-Build Contractor. Individual or Firm responsible for both the design and construction of the project.

Directive Drawings. Drawings defining the arrangement or configuration of specific components of transit facilities. They provide direction to the Designer but shall not be used as Contract Drawings.

Fare Gates. The separation between the paid area and the free area consisting of fare collection gates and other devices.

Final Design. Construction Drawings and Specification prepared by the Designers, approved by Metro, and ready for issuance to construction contractors for bidding.

Free Area. That portion of public space within the station structure that a person can occupy without paying a fare.

Heavy Rail Transit (HRT). A mode of urban transportation utilizing contact rails (third rail configuration) which provide motorized vehicles with power supplied by rectifier substations. The vehicles are capable of operating on all alignment classifications defined in this section.

Kiss-and-Ride. An area designed for the drop-off or pick-up by patrons who ride the Metro system with no stops to exceed 15 minutes. Must include designated area for disabled drop-off.

Light Rail Transit (LRT). A mode of urban transportation utilizing overhead electric power (catenary system) distribution to motorized vehicles capable of operating on all alignment classifications defined in this section.

Concourse. The public area between stations at-grade entrances and platform may include both free area and paid area.

Off-Street Entrance. An entrance to a station in which the point of access to the vertical circulation elements is located within an adjacent property, other than the sidewalk.

Paid Area. A portion of the public space of a station where the public occupies after paying a fare. An overhead illuminated sign band will indicate extent of Paid Area.

Platform. That portion of the station which is directly adjacent to the tracks, where trains stop to load and unload passengers.

Park and Ride. An area designed for the loading and unloading of motor vehicles used by transit patrons who ride the Metro Rail.

Preliminary Engineer. Individual or Firm responsible for the preliminary engineering design.

Preliminary Engineering. That portion of the total Design which identifies all essential elements of the stations and their sites, its alignment and configuration.

Platform Loading. The area or areas on a platform through which passengers enter and exit. Platform Loading Types: Center loading, end loading, quarter loading and third loading.

Platform Types. Center Platform: A platform situated between two sets of tracks. Side Platform: A platform situated along side one set of tracks.

Rail Operations Control (ROC). The structure, parking area, office and other fixed facilities related to the management and operation of the rail system, in which all train control and communications systems, controls, displays and monitors are housed. It is also the area where all emergency and malfunction alarms are sounded and recorded, and from which Metro controllers can intervene and manage system operations.

Queuing Area. Area of a station where pedestrians line up without interrupted passenger flow.

Right-of-Way (ROW). All real estate acquired or owned by Metro for the development and operation of the Metro Rail System.

Sidewalk Entrance. An entrance to a station located in sidewalk right-of-way, between the building property line and the street curb line.

Special Entrance (Public or Private). An entrance to a station from private property.

Standard Drawings. Drawings that shall be repetitively used throughout the Metro Rail System and incorporated into the Designers' final drawings.

Station. All areas and improvements within the boundaries of the station site which includes structures, platforms, entries, approaches, and the parking lots.

Station Scope of Work. A definition of the work to be performed by the Designer including milestone submittals, budget and schedules.

Top-of-Rail Profile. The profile line representing the elevation of the top of running surface rail.

Train. A single or multiple vehicle(s) combined to operate as one unit.

Trainway/Trackway. That portion of a station or structure through which the trains run.

Pedestrian Travel Lanes. For exiting calculations or emergency conditions one Pedestrian travel lane equals 22-inches in width. For pedestrian circulation one pedestrian lane equals 28-inches in width.

Unpaid Area. That portion of the public space outside the station concourse or station platform that patrons may occupy before paying the fare.

6.1.3

Reference Data

A. Patronage Analysis

The key to the organization of a station is its relationship to the surrounding area in terms of vehicular and pedestrian movement. Therefore, it is essential that patronage analysis, which is the study of the movement data pertaining to the area immediately surrounding the proposed station, be studied prior to the development of any design. Patronage analysis studies provide the latest projections of future employment, population, building development, and other activities in areas adjacent to the stations. These studies identify such fundamental factors as potential locations of trip origins, expected modes of access to the station, that vary with the time of day and time of year. The Patronage analysis will be furnished to the designer from EIR/EIS.

The projected system operational information will be used to predict the number of entries, size of concourse, number of fare devices, number of stairs, elevators, escalators and emergency exits. This information will be used to develop the preliminary engineering drawings. The preliminary engineering drawings will identify the number and location of all entrances, concourses, fare devices, and vertical circulation devices (stairs, escalators, and elevators), etc.

B. Preliminary Engineering

The Preliminary Engineering Documents will be furnished to the Designer. This document describes the stations basic configuration including platform, concourse, ancillary and plaza concepts and will act as a basis for the Designer to prepare the final design.

C. Final Design Specifications

The Designer will be furnished a set of Metro Baseline Specifications, to be edited to conform to their final design. For project specific reasons, certain specialized sections may be required, and will be prepared by the Designer.

D. Station Scope of Work

This document outlines the work of the Designer and includes stages of design, submittals, budget, and schedules.

E. Utility Locations

The Designer will locate all existing utilities by all agencies at various sites for utility relocations and design of new utilities with assistance from Metro.

F. Other General Data

Master plans, urban renewal plans, and plans for specific future projects, in the area of influence for a particular station, should be reviewed for

pertinent information that might influence site development and design possibilities.

6.1.4 Not Used

6.1.5 Station/Platform Sizing

A. Dimensioning

1. Dimensional requirements for the platform are established by either Fire/Life Safety requirements or day-to-day patronage estimates as established in the EIR/EIS. Where calculations under the two lead to different numbers, the more stringent of the two shall control.

B. Station Capacity - (Covered by Fire/Life Safety Criteria).

1. Emergency Conditions

All stations must meet the requirements for emergency evacuation as established by Metro Fire/Life Safety Criteria. Emergency exit calculations, number and capacity of exits, entraining and de-training load requirements and definitions and occupancy and occupant load determinants are contained in Fire/Life Safety Criteria and should be used when determining the size of station exit stairs and other vertical circulation elements. The Designer will prepare exit-capacity requirements for each station.

6.1.6 Design Guidelines

A. Station Accessibility

The station design shall comply with relevant accessibility standards, including the FTA's adopted Access Board's Americans with Disabilities Act Accessibility Guidelines (ADAAG) and California Title 24 CCR. All accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public. Where the circulation path is different, signage complying with ADAAG shall be provided to indicate direction to and identify the accessible entrance and accessible route. Platform Barriers complying with ADAAG requirements shall be provided.

B. Site Development

Existing building relationship, future joint developments as well as neighborhood ethnic and cultural characteristics should all be taken into consideration by the Designer, when site planning.

Site design with regard to landscaping, paving and lighting may vary within an acceptable list of materials and a predetermined budget for construction.

C. Entrances

Plaza type entrances, where economically feasible, are favored. These "off-street" entrances will relate to existing, future business and urban activities. Where plans are under way for extensive redevelopment of the plaza area or whole street, special public entrances for the Metro Rail System may be designed in conjunction with these new developments. However, in all cases, designs shall maintain a clear, highly-visible and distinct Metro identity for ease of recognition by our patrons and for operational and maintenance purposes.

1. Underground Stations

- a. It is assumed that various business enterprises located near the stations will wish to have direct access from the station to their facilities. Any such entrances including any required CCTV coverage, signage or other associated appurtenances will be financed and maintained by the private enterprises, and will have lockable close-down doors. While such entrances should be considered as valuable elements, they will not take the place of any of the required station entrances, unless permanent access to a public right-of-way is provided. As an exit path the private entrance shall not be included as part of station exiting requirements.
- b. Entrances should be designed so that the station can be closed for a short period of time every day, or for a longer period of time in emergencies. Closure facility shall be at the top of all entrance stairs/escalators.
- c. Station entrance design as well as materials, textures, and finishes shall conform to Metro System Criteria, and Metro entrance portal and canopy designs.
- d. Entry canopies shall be provided to have weather protection for outdoor escalators and elevators at underground and aerial stations, and shall not conflict with future joint developments..

2. Aboveground Station

- a. Entrance areas located at street level, above or below freeway median, shall have free area and ticket vending equipment.
- b. Access to platform, from entrance areas above or below platform, shall be by ramp, stairs, escalator and elevator.
- c. Stations shall have unpaid area(s) or free area(s) which shall be separated by Fare gates and barriers with the paid area(s).
- d. Station access walkways and ramps shall have handrails/guardrails on either side, 34 to 38-inches high for handrails; 42 inches high for guardrails.
- e. Crosswalks shall be defined by a continuous detectable warning, 36-inches wide and in compliance with ADAAG, Section 705 Detectable Warnings and 406, Curb Ramps.
- f. Provide direct and safe pedestrian access.
- g. Entrance walkways crossing rail tracks to reach station platforms shall be level and flush with the top of rail at outer edge and between rails.

D. Patron Circulation

The majority of transit commuters are familiar with the process, of entering the Metro Rail system. In planning both the layout and the signage, consider that the commuter generally knows his way around the station. The layout should promote a "user-friendly" attitude, with ease of use with route recognition the primary objective. Patrons must be encouraged to use the system.

Some basic principles which should be considered in planning station circulation are as follows:

1. People tend to keep to the right, and for that reason, right-hand flows are recommended, although not mandatory.
2. Any cross-flow of passengers is highly undesirable, and the layout is such that passenger flows moving in the opposite direction will be separated at all times.
3. Dead-end conditions shall be avoided wherever possible.
4. Whenever there is more than one opening, people tend to move toward the nearest one, even if they are not sure it is the right one.
5. People will tolerate longer delays in entering than exiting the stations, but designs of stations should attempt to eliminate waiting.
6. Circulation patterns and station layouts should enable the patron to know where they are and where they are going at all times.
7. Queuing distances shall be maintained at all stations, to promote and guarantee ease in circulation and access to trains. See Table 6.3.

E. Platforms/Concourses

1. Platform Configuration

- a. All station platforms shall be raised, either center or side platform type depending on traffic conditions, site constraints, or station layout.
- b. In general, at-grade station platforms should be end loaded. Aerial or underground station entry points should be evenly distributed to reduce congestion and travel distance.
- c. Freestanding columns that are to be within 10'-0" of platform edge shall be located away from locations of vehicle doors during station stops to minimize congestion. Columns beyond 10'-0" shall have no restrictions in their placement.
- d. Elevator, escalator and stair queuing space shall be free of any and all obstructions. (See Table 6.3)

2. Platform Area

Station platforms shall be sized to accommodate site-specific patronage projections. The minimum area (excluding elevator, escalator, stair queuing space, and the 24-inch platform safety edge strip) should accommodate the peak 15-minute entraining load at 10 sf /person or the peak 15-minute de-training and entraining loads at 7sf /person.

- a. The platform edge pavers will be consistent with various rules and regulations implemented by the ADAAG and Title 24 CCR.
- b. Platform Barriers will be consistent with various rules and regulations implemented by the ADAAG, Title 24 CCR, and California Public Utilities Commission.

3. Platform Widths - See Standard and Directive Drawings

4. Platform Lengths

a. System stations

The length of platforms shall be as follows:

Metro Purple Line	450'
Metro Red Line	450'
Metro Green Line	270'
Metro Blue Line	270'
Metro Gold Line	270'
Metro Exposition Line	270'
Future LRT Lines	270'

5. Underground Station Vertical Clearances

a. Platform - See Standard and Directive Drawings

- 1) Any station elements that could be targeted for theft or vandalism (e.g. light fixtures, speakers, cameras, etc.) shall be located at a minimum of 9'-3" above traveled pathways. The potential to use benches, trash receptacles, etc. to access these elements should also be considered in locating these elements. Horizontal canopy framework that could lend itself to climbing shall be located above 9'-3."
- 2) Platform barrier shall be provided to stop or deter patrons with vision impairments from walking off the platform between the rail cars. See Standard and Directive Drawings.
- 3) Warning line or stand behind line shall be designed into the platform. See Standard and Directive Drawings.

b. Concourse Layout - See Standard and Directive Drawings

- 1) In order to separate some of the complex activities involved in moving people in large numbers in and out of stations, a concourse area may be required. Depending on site conditions the concourse area may be at street level, below grade above the platform, or in an elevated station configuration, incorporated above grade between platform and street.
- 2) The concourse functions as a transition area between the points of entry into the station and the access ways to the train platforms. The concourse also provides space for various functions including the fare collection equipment, fare gates, telephones, map cases, passenger's elevator, trash receptacles and other patron amenities.
- 3) The concourse may also enable the patron to move horizontally to a passageway where stairs, escalators or elevators will take them directly to the platform or plaza street level.

- 4) Concourse types - Full length concourse extends the full length of the station. Partial concourse occupies a portion of the station.
 - 5) Private entrance access from adjacent structures can also be accommodated along the length of a concourse.
- c. Public Areas
- 1) In all public areas the minimum overhead clearance to obstructions shall be 11 feet above finish floor. However, at localized critical points such as portals, clearance may be reduced to not less than 9 feet.
 - 2) Passageways shall maintain an overhead clear height of a minimum of 11 feet 6-inches.
- F. Station Amenities

1. Weather Protection

A minimum protection from the rain shall be provided for the following.

- a. Fare Vending Equipment including a minimum 3' x 3' area in front of the equipment.
- b. Fare gates
- c. Map viewing areas – Mapcases shall be located in conformance with Metro Signage Standards at plaza, concourse, and platform locations.
- d. 75% of required platform seats (benches).
- e. 50% of boarding platform area.
- f. Outdoor escalators – Comply with the requirements of ASME A17.1, Section 807.
- g. Outdoor elevator – Provide canopy above door and entrance area. Minimum 4'-0" projection full width of shaft front enclosure.

2. Windscreens for Aerial and At-Grade Stations

To protect patrons from strong wind-blown rain, transparent windscreens shall be provided on aerial station platforms. Windscreens shall be provided on at-grade station platforms located in the median of a freeway. A minimum of 5% of the peak 15-minute entraining load, with design headways considered, shall be protected. The design shall assume that rain falls at a 10 degree angle from vertical. Drip lines or gutters shall not be over traveled pathways.

3. Seating

Ticketing Area

No seating shall be provided.

Concourse Area

No Seating shall be provided.

Platform Level

Passenger seating (with a minimum of 12 LF per platform) shall be distributed to two or more locations. For at-grade and aerial Light Rail stations, two benches with back support (per platform) shall be provided in a location protected from the rain. For Heavy Rail stations, a minimum of three benches with back support shall be provided. All seating must be arranged so as not to interfere with patron circulation and/or emergency exiting. See Metro Rail Architectural Standard and Directive Drawings.

Plaza Level

Benches shall not be installed at the plaza level. However, for some project specific stations, Metro might decide to install seating. Once that decision is approved by Metro Change Control Board using Metro Deviation Request Procedure, the following criteria shall apply.

In keeping with the principles of Crime Prevention through Environmental Design (CPTED), all seating must be designed to discourage lying down and vandalism. This also includes built elements not intended for seating such as low walls, landscaping elements, station equipment, artwork, etc. All seating must be in areas with sufficient lighting and be visible from the adjacent street(s). The project designer shall also coordinate with Metro Safety and Security to ensure seating is in view of Metro security cameras. All seating must be arranged so as not to interfere with station access/egress.

Bench Design

Benches with back support shall be designed to meet the requirements outlined in the ADAAG Section 903 (except 903.2), plus current state and local requirements for persons with disabilities. Consistency and uniformity of bench design contributes to Metro operational and maintenance requirements and systemwide passenger needs. See Metro Rail Standard Drawings.

4. Trash Receptacles

Standard trash receptacles shall be provided on the concourses, platforms, and at fare vending areas. Standard receptacles shall not be provided for the general site, parking, or kiss-and-ride areas.

Maximum travel distance to the nearest receptacle on the concourses or platforms shall be 70'. A minimum of one receptacle per fare vending area and two minimum per platform shall be provided. Minimum capacity of combined fare vending and platform receptacles will be 0.12 gallons x peak hour entraining and detraining load.

Trash receptacles shall be bolted down to avoid removal by unauthorized persons. Liners shall conform to the system's standard 32-gallon round welded wire mesh receptacle as indicated in Metro Architectural Standard drawings.

G. Ancillary Space Requirements

1. Ancillary spaces shall be provided in subway stations as shown in Table 6.2, Ancillary Space Requirements. Specific requirements for train and station operation related spaces are specified in other sections of these criteria. Spaces such as sewage ejector rooms, sump pump rooms, and valve rooms shall be provided as required, of a size to house the required equipment. Appropriate access shall be provided.
2. Ancillary spaces for at grade or aerial stations (e.g., electrical, elevator machine, train control communications, and traction power rooms or buildings) may be required at or near each station. (See Table 6.2 for requirements). In addition to the mechanical and electrical requirements of each space, the following shall be incorporated into the design:
 - a. Specify Metro-standard doors, hardware, interior paints, and lighting fixtures.
 - b. Provide reasonable access to a permanently maintained service vehicle parking stall. (Less than 200 feet travel distance)
 - c. Provide permanent vehicular access to the emergency generator. This access is required only in an emergency condition; access may be on and across walks, plazas, etc.

H. Safety and Security

See Metro Safety and Security and Fire Life/Safety Criteria Manual.

I. Queuing Distance Requirements

Adequate space shall be provided around the fare vending machines, standalone validators, and future or current provided fare collection gates to allow patrons to buy their tickets and pass through the gates without undue crowding and exiting through this space in case of emergencies. Minimum queuing distance requirements are given in Table 6.3.

TABLE 6.2

**METRO RAIL STATIONS
ANCILLARY SPACE REQUIREMENTS**

Refer to Section 7-Electrical; Section 8-Mechanical for further requirements
(Equivalent areas permitted)

Functional Element	Underground Station		Aerial At-Grade Station (Below Platform)	
	Minimum size	Req'd Clg HT*	Minimum Size	Req'd Clg HT*
1. Traction Power Substations with Auxiliary Power Transformers	50' x 80'	14'		
2. Traction Power Substations without Auxiliary Power Transformers	50' x 68'	14'		
3. Auxiliary Power w/Transformers	35' x 55'	14'		
4. Auxiliary Power w/o Transformers	17' x 31'	14'		
5. Train Control/Communications (TC&C) w/crossover @ station w/o crossover @ station	45' x 54' 28' x 42'	14'	** 9'-2"x 62'-0"	8'-6" min.
6. Battery Room for: Train Control/Communications Auxiliary Power	15' x 20' 11' x 17'	14'		
7. Elevator Equipment (for two machines) (for one machine)	8' x 17' 8' x 8'	8' 8'	9' x 11'	8'
8. Storage	8' x 8' minimum	8'	As required	
9. Mechanical Room a) for Ancillary Room @ the end w/Train Control/Communications b) for Ancillary Rom @ the end w/o any Train Control/Communications	16' x 15' 12' x 12'	12' 12'		
10. Fan Room for traction power	25' x 40'	14'		

TABLE 6.2 (Con't)

**METRO RAIL STATIONS
ANCILLARY SPACE REQUIREMENTS**

Refer to Section 7-Electrical; Section 8-Mechanical for further requirements
(Equivalent areas permitted)

Functional Element	Underground Station		Aerial At-Grade Station (Below Platform)	
	Minimum size	Req'd Clg HT*	Minimum Size	Req'd Clg HT*
11. Emergency Fan Room @ platform level @ each end @ concourse level @ each end	55' x 45' 18' x 80'	14'		
12. Not Used				
13. Air Supply Unit Room @ concourse level @ each end	44' x 48'	14'		
14. Smoke Exhaust Room	Inc. in air supply @ mezz. Level @ each end unit room or under platform room			
15. Under Platform Exhaust Room @ each end	15' x 32'	14'		
16. Under Platform Exhaust Plenum	42ft ² /Track			
17. Ejector Room	8' x 12'	11'		
18. Sprinkler Valve Room @ each end/concourse level	8' x 14'	10'		
19. Sump Pump	10' x 10'	8'		
20. Gap Breaker Station	16' x 22'	12'		
21. Emergency Equipment @ platform level	4'6" x 8'	8'		
22. Custodial Room Custodial Closet	8'6" x 16' 3'6" x 8'	8'		

TABLE 6.2 (Con't)

**METRO RAIL STATIONS
ANCILLARY SPACE REQUIREMENTS**

Refer to Section 7-Electrical; Section 8-Mechanical for further requirements
(Equivalent areas permitted)

Functional Element	Underground Station		Aerial At-Grade Station (Below Platform)	
	Minimum size	Req'd Clg HT*	Minimum Size	Req'd Clg HT*
23. Electrical Room @ each platform @ each end Below platform	8' x 10'	8'	Depends on platform width	8' minimum
24. Toilet Concourse Level	6'6" x 8'	8'		
25. Trash Room Concourse Level	8' x 10'	8'		
26. Staff/Security Room Concourse level	8' x 12'	8'		
27. Auxiliary Power Substation	42' x 50'	14'		
28. Electric Incoming Service	40' x 40'	16'		
29. Cable Room @ platform level (if separate room)	Use space under emergency stair 8' x 10'	8'		
30. Tunnel Valve Room @ each end, platform level	6' x 18'	10'		
31. Communications Room at Station			8' x 12'	10'

TABLE 6.2 (Con't)

**METRO RAIL STATIONS
ANCILLARY SPACE REQUIREMENTS**

Refer to Section 7-Electrical; Section 8-Mechanical for further requirements
(Equivalent areas permitted)

Functional Element	Underground Station		Aerial At-Grade Station (Below Platform)	
	Minimum size	Req'd Clg HT*	Minimum Size	Req'd Clg HT*
32. DWP Power Building Standard Added Switchgear			26'-4" x 41'-4" 41'4" x 51'-4"	12'
33. Communications and Signal Room/Building			Prefab Bldg. Size dependent on switching requirements.	12'
34. Traction Power Building/Room			Prefab Bldg. Size dependent on switching requirements.	12'

* = Clear of any obstruction

** = LRT TC&C Room located below at-grade station platform.

NOTE: DWP building size is for 34.5 KV power requirement.

TABLE 6.3
METRO RAIL STATIONS
MINIMUM QUEUING DISTANCE REQUIREMENTS*

		<u>Central Business District Station</u>	<u>Suburban Station</u>
Fare Gate***		20'-0"	15'-0"
Ticket Vendor and Add Fare Machines		8'-0"	6'-0"
Stair**/Escalator**	2 Device	20'-0"	15'-0"
Stair**/Escalator**	4 Device	30'-0"	25'-0"
Elevator**		12'-0"	8'-0"

NOTES:

In situations where a fare gate, stair, or escalator faces a stair or escalator the minimum clear space between them shall be the sum of that required by each less 25%
(2 Device suburban station = 15 + 15 - 25% = 22' - 6")

Elevator facing a fare gate, stair, or escalator the minimum clear space between each device shall be the sum of that required by each less 25% (2 Device suburban station = 15 + 8 - 25% = 17' - 3")

See Metro Architectural Directives and Standard Drawings for fare gates, typical location, layout, configuration, and details.

Elevator facing an elevator the minimum clear space between the two shall be 10' - 0".

* SEE DIRECTIVE DRAWINGS

** Distance is measured to property line or any obstruction. Escalator is measured from railing intersection with floor. Stair is measured from the face of bottom step.

*** Distance is measured from facing end of fare gate console.

J. Accessibility Provisions

Specific provisions shall be made by the Designers for the reduction and elimination of operating barriers in all Metro Rail public facilities and vehicles elements (passenger stations, vehicles, platforms, fare barriers, operating and maintenance facilities) which impede the mobility of elderly and patrons with disabilities and system employees. The design criteria referenced and contained herein denote special requirements mandated by State and Federal regulations and are intended to make all Metro Rail public facilities and vehicles usable by people with such physical disabilities as the inability to walk, difficulty walking, reliance on walking aids, sight and hearing impairments, in coordination, reaching and manipulation impairments, lack of stamina, difficulty interpreting and reacting to sensory information, and extremes of physical size. These provisions will allow accessibility and usability of Metro Rail public facilities and vehicles to disabled persons and will allow them an opportunity to travel in safety and comfort equal to that afforded by other patrons.

The criteria referenced and contained herein are based on space, equipment and human factors as related to wheelchairs, walking aids and reach limitations, and shall be incorporated into the design and specifications for all Metro Rail Public Facilities.

1. Federal Requirements

The Americans with Disabilities Accessibility Guidelines (ADAAG) is applicable to the Metro Rail Project through the Department of Transportation. The requirements of this standard parallel the State requirements for the most part; however, the conditions listed below are more stringent than the U.S. D.O.T. requirements and therefore shall be incorporated into the design.

- a. Where public parking is provided, the minimum number of accessible spaces provided shall be determined as shown in Section 6.12, Table 6.6.
 - 1) Access aisles adjacent to accessible spaces shall be 60 inches wide minimum.
 - 2) One in every eight accessible spaces, but not less than one, shall be served by an access aisle 96 inches wide minimum and shall be designated "Van accessible".
- b. Accessible walks from an accessible parking space, a public sidewalk or public transportation stop to an accessible station entrance shall be provided with a minimum 60 inches X 60 inches level zone suitable for wheelchair passage or rest, spaced at no more than 200 feet apart, when the width of the accessible walk is less than 60 inches.
- c. All handrails for stairs, ramps and along accessible walks shall comply with the following.
 - 1) The nominal diameter or horizontal cross section of the gripping surface of a handrail shall be 1-1/4 inches to 1-1/2 inches.

- 2) The top of a handrail shall be mounted at a height which complies with Title 24, CCR, measured from finished floor, ramp surface or tread nosing to the top of the handrail.
- d. In the design of signage and identification, the following requirements shall be met.
- 1) Metro will provide digital graphic files for all signage.
 - 2) For raised or recessed letters, numbers or symbols, the height shall be 5/8" (min.) to 2" (max.).
 - 3) Character identification shall be mounted at a height of 48" to 60" above finished floor (AFF), to the baseline of the top line of the tactile lettering, mounted on the wall at the latch side of the door.
 - 4) A combination of upper and lower case lettering shall be utilized in all signage, arranged to provide greater readability to persons with visual impairments.
 - 5) Doors leading into hazardous areas that might prove dangerous to a blind person shall be made quickly identifiable by tactile/Braille signage, mounted on the wall at the latch side of the door.
- e. The mounting height of handrails in elevator cabs shall be 31" to 33" above the floor to top of rail.

2. State Requirements

The State of California regulations pertaining to barrier-free design are contained in Title 24 of the California Code of Regulations (CCR), Parts 2, 3 and 5. These regulations are adopted by reference, with exceptions as noted in Article 1.6.98-B. A compilation of the State accessibility requirements is contained in the document Regulations for the Accommodation of the Disabled in Public Accommodations, available from the office of the State Architect.

K. Seismic Criterion for Equipment - See Section 5 - Structural Criteria.

6.2 ADVERTISING

6.2.1 Introduction

Revenue-generating advertising displays are permissible in Metro Rail stations as well as on the interior and exterior of Metro Rail vehicles. Metro's Communications Department is responsible for revenue-generating contracts for advertising on the Metro system.

Consistent with Board-approved Policy Com-6, "Metro System Advertising," any recommended contracts for revenue-generating advertising displays on Metro Rail will be brought to the Metro Board for review and approval. Such contracts will be administered by the Chief Communications Officer or their designee.

6.2.2 Basic Goals

Metro will:

- A. Use station advertising to generate revenue, but only to the extent that the advertising does not interfere with the station's visual and design elements including artwork or patron convenience, safety and security, or adversely affect combustible loading.
- B. Ensure that advertising, by its placement and treatment, does not interfere with orderly patron circulation. Placement of advertising on or adjacent to escalators, stairs, or system graphics will not be permitted.
- C. Discourage defacement or damage by placement and form of advertising. Because of potential vandalism, merchandise display cases will not be permitted.

6.2.3 Criteria

- A. Metro Communications Department shall review and approve all proposed advertising locations.
- B. Advertisements will be carefully located, adjacent to areas of heavy traffic, but not obstruct or retard passenger flow.
- C. Advertising shall not be visible from outside Metro Rail Underground Stations.
- D. Provisions may be made for advertisement kiosks or other equipment displays to be reviewed on a case-by-case basis.
- E. Capital and operating costs shall be sponsor/vendor's responsibility.
- F. For related information, refer to Subsection 6.10, Signage and Graphics.

6.2.4 Standard Advertising Panel for Underground Stations

- A. Platform Level: Future advertising panels shall be used per Architectural Directive Drawing.

6.3 ARTWORK

6.3.1 Introduction

In 1989, Metro Board of Directors adopted a Public Art policy which mandates an allocation of art funds and establishes procedures for artist selection, architect collaboration and community involvement. The purpose of this chapter is to outline the goals of the Metro Art Program in coordinating works of art into the design and construction documents, and to outline a procedure to be followed by the Preliminary Engineer (PE), the Designer and the Architect.

Metro Art will manage all artist contracts, coordination and interfaces. A public art budget will be established for the incorporation of public art within the Project. The budget will include: artist design fees, expenses associated with the fabrication and installation of artwork, and professional contractor services required for proper fabrication, installation and incorporation into the Project.

6.3.2 Basic Goals

The goals of Metro Art Program are as follows:

To enhance the everyday act of commuting and expand the public experience of art through the commissioning of the highest quality art in the Metro transit system.

To enrich the transit system for both residents and visitors by creating a unique visual identity for each station through works of art.

6.3.3 General Principles - General Guidelines

- A. Artwork shall conform to the same general guidelines established for the Station Design Introduction (Section 6.1.1). The Artwork must be of high quality, be site specific, require minimum maintenance, be resistant to graffiti and vandalism and conform to Metro Art Guidelines for Materials and Finishes.
- B. Metro Art is tasked with identifying public art opportunity locations within the station and corridor environment and will interface with the Planning Consultant, the Architect, the Designer and the Design-Builder (D-B) at key stages in the development and construction of the Project. The PE Design Team and the Design Builder will include artwork locations and appropriate details and notes in the construction documents.
- C. In order to ensure that the artists' original, approved, design intent is implemented and to ensure that all artwork is in accordance with Metro Art collection standards, Metro Art shall be involved in the review and comment stages of the DB design review submittals.
- D. When implementing Joint Powers Agreement (JPA) projects, Metro Art will facilitate artist contracts with the JPA. Contract with the JPA will include design, fabrication and delivery of the artwork to the construction Project site, ready for installation by the Design-Build Contractor. The artworks will be included in the construction documents as "furnished by Owner and installed by the Design-Build Contractor."
- E. Metro Art works with members of the communities impacted by the Project to research and assemble information and unique insights regarding their community. This information is made available to the artists and is intended as a resource, referral and point of departure for artists to consider when developing their artwork designs. Artists are selected through a peer panel involving arts professionals and community representatives in keeping with Board policy for public art.
- F. The inclusion of public art in the station environment allows for expressive visual variations between each station and the urban areas they serve and shall be considered as elements of variability. When possible, and as determined by Metro Art, public art opportunity locations within stations shall occur at similar locations and include the same materials and finishes.
- G. Metro Art may also be called upon to select artists and to identify art opportunity locations for the corridor environment in support of mitigation efforts intended to reduce negative impacts of noise walls, construction

fences, visual barriers and other detrimental urban conditions affecting the community. Artworks may be temporary or permanent and shall be paid for through funding sources related to mitigation, urban enhancement funds, or by other means that do not include the established art budget for the Project.

6.3.4 Donor Program

Donations from local governments and corporations may augment the art program. When funds are received, Metro will be provided additional budget to add to or enhance artwork. Metro Art shall coordinate all donor program requirements.

6.3.5 Artist and Architect Collaboration

- A. As determined by Metro Art and Metro Architect, the Artist and Designer may, on occasion, agree upon design elements that will be designed in common as part of the development of a joint design philosophy. The designs thus agreed shall be held to be elements of design and not Artworks.
- B. As determined by Metro Art and Metro Architect, the Artist may design discrete artwork items. These items will be treated as Artist designed and included in the construction documents as such. The Artist shall be responsible and liable for the design of any discrete Artwork items. The Artist shall collaborate with the Architect for coordination and placement of the artwork. The artwork shall not be in conflict with the architectural design.
- C. Based on the type of Artist services agreement, the Artist may provide design services; design and art fabrication services; or design, fabrication and installation services. In all cases the Designer shall note the appropriate level of Artist requirements in the construction documents.
- D. On occasion and as indicated in the Metro PE Contract Documents the Design-Build contractor shall be responsible for the fabrication and/or installation of artworks. The Artist shall be responsible for providing final design of the artwork.
- E. Artist shall provide artwork for installation according to an agreed upon schedule by the contractor.
- F. The Designer is responsible for reviewing the Artist's design concepts and commenting on: constructability, location, suitability of materials, safety/ security problems and rough order of magnitude design/construction cost.
- G. Aesthetic conflicts between the Artist and Designer shall be resolved through deliberation with Metro Art and Metro Architect representatives.
- H. Designers shall have the final say on all issues pertaining to structural integrity and all areas of code requirements unless in conflict with broader Metro requirements.

6.4 CODES

6.4.1 Introduction

Metro Rail System in its initial development will pass through several cities and the county. It is Metro's intention to adopt a single set of codes and regulations for use throughout the System. Therefore, this chapter lists the building codes, legal regulations and criteria to which the design of Metro Rail stations and facility shall conform. Because of the unique nature of rail transit, variances from existing specific codes and standards could be provided for certain functional elements.

In the event that a condition is found which is not covered by these codes, regulations and criteria outlined herein, the Designer should refer the matter to Metro.

6.4.2 Basic Goal

Providing facilities which are free of recognized hazards that could compromise the health and safety of the public or the Metro Rail System patrons and employees.

6.4.3 Applicable Codes and Standards

A. Compliance

1. The design of station shall comply in all respects with the codes and standards listed below and with Metro Fire/Life Safety Criteria Manual.
2. These codes and standards shall in each instance be the latest edition or issue, and the most recent revision, amendment, or supplement adopted by the local jurisdiction at the date of notice to proceed with the final design of each specific project, or as directed by Metro.
3. With the exception of the variances described herein, where the requirements of more than one code or standard are applicable, the more restrictive shall govern.

B. Codes Standards

1. American National Standards Institute, Inc. (ANSI)
2. Access Board Accessibility Guidelines for Buildings and Facilities (ADAAG) effective November 29, 2006, and CALDAAG, latest edition.
3. American Society of Testing and Materials (ASTM)
4. California Building Code (CBC)
5. California Code of Regulations (CCR), Title 8, Industrial Relations
6. California Code of Regulations (CCR), Title 19, Public Safety
7. California Code of Regulations (CCR), Title 24, Building Standards Code
8. California Code of Regulations (CCR), Title 24, Part 2 (State Building Code)

9. California Public Utilities Commission (CPUC) General Orders
 10. Los Angeles City Building Code
 11. Los Angeles City Fire Code (LA Fire Code)
 12. Los Angeles County Building Code
 13. Los Angeles County Fire Code (LA Co Fire Code)
 14. NFPA 101, Life Safety Code
 15. NFPA 130, Fixed Guideway Transit Systems
 16. Underwriters Laboratory, Inc. (UL) 44, 83, 555
 17. Building Code of Local Jurisdiction
 18. ASME A17.1
 19. National Design Specification for Wood Construction
- C. Applicable Documents
1. Occupational Safety and Health Act (CAL-OSHA)
 2. Subway Environmental Design Handbook Vol. 1, 2nd Edition
 3. American Public Transportation Association - Rapid Transit Design Guidelines.

6.5 CONCESSIONS

6.5.1 Introduction

The intent of this Section is to inform the Designer of the requirements and limits of concession space, while at the same time maintaining an attractive, functional, and enjoyable environment for its patrons. Accordingly, the concessions permitted by Metro shall conform to the general standards set forth below.

6.5.2 Basic Goals

- A. To provide limited facilities and spaces for concessions which may be required for the convenience of Metro Rail System patrons.
- B. To ensure that concession operation does not produce a negative impact on the Metro Rail System, in the form of litter, security, pest infestation, or other undesirable conditions.
- C. To ensure that concession operation does not interfere with patron circulation and transit operation.
- D. To generate revenue.

6.5.3 Design Criteria

- A. Concessions may be located only on the concourse level in the Free Area in grade separated stations. No concessions operations will be allowed on the platforms. No food or drink concessions will be permitted.
- B. No food, requiring on-site preparation or refrigeration, beverage or tobacco concessions are permitted in the stations or in designated operational zones on station entry plazas and on the platform areas.

- C. Limited manned vending will be encouraged for items such as flowers, magazines, newspapers and notions in designated non-operational free areas of the station concourses and entry plazas. All physical components to be consistent with Metro design criteria regarding materials, dimensions, close-down, fire/life safety requirements. All plans shall conform to local, and state codes, and be prepared by licensed professionals.
- D. Built-in mechanical vending machines for newspapers, postage, and automatic teller machines could be allowed in Metro designated free areas of station. All plans shall meet the requirements of local city codes, and be prepared by licensed professionals.
- E. Signing and graphics associated with vending machines and manned concessions shall conform to Metro Signage Standards.
- F. Concessions shall not obstruct lines of sight, create cul-de-sacs, obstruct passenger flow, or present fire/life/safety problems.
- G. Concessions shall consist of two basic types:
 - 1. Built-in
 - 2. Free-standing
- H. Wet concessions are not allowed unless prior written approval is granted by Metro.
- I. Concessions shall be part of a total station design and shall not be an element tacked on as an after thought.

6.5.4 Specific Criteria

A. Coin-Operated Equipment

~~1. Public telephones will be provided in all transit stations as indicated in Subsection 9.4 Communications.~~

21. Coin-operated newspaper vending machines may be authorized for stations.

32. Provisions for possible future vending machines will be limited to space that is available, and that conform to Metro station design standards.

43. Concession Vending Machines

If provided, standard configuration and materials will be specified to assure uniform stocking of repair parts for maintenance.

Logos and messages oriented to type of products will be consistent with Metro Signage Standards.

6.6 LANDSCAPING

6.6.1 Introduction

The following establishes objectives, general criteria, and design parameters for the landscaping and irrigation of system-wide Metro facilities. These

facilities include at-grade and aerial stations, subway entry portals, park-and-ride lots, kiss-and-ride areas, traction power substations, communication and signaling facilities, power substations, yard and shops facilities and, as appropriate, portions of the right-of-way line segments and adjacent streetscape elements.

Designs shall be consistent with the guidance provided by this criteria; the Preliminary Engineering Design Drawings; Project Guideline Specifications; and Project Standard Detail Drawings. Any deviation from these guidelines must be approved by Metro Project Manager for the applicable Metro Rail Project.

A. Codes and Standards

Unless otherwise stated, landscaping for new facilities or as part of alterations to existing facilities, shall be designed in conformance with local landscape ordinances or published standards of the agency having jurisdiction or with the criteria contained herein, where such criteria exceed agency standards.

The following documents are incorporated into these design criteria by reference and should be adhered to, in the specification of plant materials:

- American Standard for Nursery Stock ANSI Z60.1, adopted by the American Association of Nurserymen, Inc.
- Bailey's Standard Cyclopedic of Horticulture.
- Standardized Plant Names, American Joint Committee on Horticulture Nomenclature (AJCHN)

Where the requirements stipulated in this document or any referenced sources are in conflict, the more strict requirements apply.

Unless specifically noted otherwise herein, the latest edition of the code, regulation and standard that is applicable at the time the design is initiated shall be used. If a new edition or amendment to a code, regulation or standard is issued before the design is completed, the design shall conform to the new requirement(s) to the extent practical or required by the governmental agency enforcing the code, regulation or standard changed.

6.6.2 Objectives

Provide a landscape design that:

- A. Will be recognized by the community as a yardstick of innovation and excellence and within budget constraints.
- B. Ensures the safety and comfort to the Metro Rail system patrons.
- C. Adds to the character and identity of the existing neighborhood.
- D. Is responsive to and complimentary with station architecture, art, signage, graphics and lighting design.

- E. Is compatible with local climatic conditions, conserves water resources, uses reclaimed water system for irrigation and uses native plants, where feasible.
- F. Requires minimum maintenance, and reasonable initial cost.
- G. Does not impede motorist, train operators, or pedestrian sight lines.

- H. See Metro Sustainable Design Guidelines in Design Criteria Section 2, Environmental Considerations.
- I. Will not interfere with Wayside Support Systems, such as OCS.

6.6.3 Coordination

A. Design Team

The Landscape Architect shall coordinate design and production of construction drawings with Designers and Metro Art to ensure that landscaping, facilities architecture, site engineering and station art are visually and functionally compatible. Coordination is particularly important with regard to the design of lighting, paved surfaces, walls and site furnishings. Metro Facilities Maintenance group shall be involved in the review and comment stage of landscape design review submittals.

B. Local Agencies

The Landscape Designer shall ensure that local code requirements are satisfied and shall coordinate all discussions involved with regulations, criteria or policies of local agencies. Coordination for permits from local agencies is the responsibility of Metro.

6.6.4 Design Criteria

Transit projects that are predominantly at-grade or above-grade shall be designed to ensure a consistency of concept and materials throughout the project.

Entry plazas and portals for stations shall be designed to express an individual character consistent with the given surroundings and context.

A. Compatibility with System Design

1. Maintenance of the overhead contact system (OCS) is critical to operations. A maintenance free clearance of 10-feet must be provided and maintained between trees and OCS lines. Trees located at station areas shall be selected and placed to prevent limbs from falling onto the OCS and to insure adequate pedestrian clearance under limbs. "Tree selection shall ensure that trimming is not required more frequently than annually to maintain adequate clearance and sight-lines.
2. Maintenance of a clean trackway to prevent contamination of ballast, thereby ensuring positive drainage away from the track, is also critical to safe operations. Plants located at ballast edge shall be small-leaf, evergreen plants to minimize plant litter in the ballast.

3. No trees, fences or shrubs shall be installed, planted or maintained above four feet above top of rail within 250 feet of any grade crossing.
 4. Plantings shall be designed to promote safety and security of Metro passengers. Plantings shall be designed to avoid concealed places, blind corners and obstructions for emergency response personnel and equipment.
 5. Plant material shall not encroach upon walkways, bike paths, or station platforms.
 6. Plant material shall be selected and located so as to avoid conflicts with all utilities, including overhead lines and hydrants.
 7. Whenever possible existing native vegetation and habitat shall be preserved or restored.
 8. No foliage shall be installed or maintained above the trackway.
 9. Design barriers to planted areas to minimize access by pedestrians.
 10. Plantings shall be designed to allow plants to attain their ultimate height and spread. To prevent concealment issues, mature plants should not exceed 36 inches in height (CPTED).
 11. Plant materials shall be selected to minimize plant litter on walkways, bike paths or station platforms.
 12. Utilize Mulch generously to minimize weed growth and loss of soil moisture. It can be an organic material such as bark or compost or inorganic such as crushed rock or stone. Mulching is a very cost effective means of conserving water. It eliminates water loss through evaporation and by preventing weeds.
 13. Avoid the use of plants that are dense in foliage from the ground up designed to form screens and hedges adjacent to buildings or walls if obscured views are created. A clear view across the ROW is to be preserved.
 14. No creeping vines shall be planted on any fencing along the right-of-way to allow maximum visibility both in and out (CPTED)
- B. Site Preparation
1. Finish grading shall be sloped sufficiently to afford adequate drainage, yet minimize erosion. Plantings shall allow for positive, easily maintained drainage.
 2. All slopes shall be stabilized to prevent physical failure, erosion and maintenance problems.
 3. Retaining walls shall be treated to prevent defacement. Plantings are recommended as a long-term deterrent to graffiti. When plantings on walls are precluded, architectural treatments such as bas-relief and decorative form-liners are recommended, and shall be in keeping with the character and consistency of the established project architectural design.

4. A suitable soils report from a recognized soils testing agency shall be obtained. The soils report shall verify the viability of the soil for landscape planting and robust health of native species selections. The soils report shall also include recommendations to alleviate problem soils conditions, if necessary.

C. Selection of Plant Materials

1. Considerations

Considerations for the selection of plant materials shall include:

- Initial cost
- Long Term Operational/Maintenance costs
- Compatibility with Station Architecture and Urban Context
- Local availability
- Attractiveness
- Growth rate
- Tolerance to drought, wind, pollutants and abuse
- Hardiness
- Soil and drainage conditions
- Sun/shade preferences
- Maintenance characteristics including leaf and limb litter
- Potential damage to adjacent paved areas by roots
- Watering requirements
- Attraction of rodents or insects
- Native to Southern California and local environs.

2. Growth Rate

Select trees with moderate growth rate that will not grow aggressively out to the ROW or to adjacent streets.

Shade trees shall be selected which produce a relatively mature canopy within 4-5 years of installation. Ground covers shall be selected to provide complete coverage within two (2) years of installation. Once established, no plant material should need maintenance more than four times yearly in order to contain it within its designated planting areas.

3. Environmental Adaptability/Soils Testing

Plant material shall generally have low water requirements, be hardy, long lived and be resistant to disease. Native plants are preferred, when appropriate. Soil testing shall be undertaken to ensure proper plant selection, acceptable soil amendments and/or replacement of soils, as necessary. Soil testing programs shall consider the possible presence of hazardous materials including the possible presence of

residual arsenic and/or herbicides that are often found on former railroad right of way which utilized wood ties.

D. Street Trees

Street trees shall be selected and spaced to conform to local requirements. Tree selection may require coordination with local agency. Where no existing local requirements apply, selection and spacing shall be approved by Metro.

Minimum size for trees located in paved pedestrian areas shall be 24" box minimum. Trees shall be spaced between 20 and 50 feet apart, depending on the species and local agency requirements. Exact spacing shall be adjusted to accommodate conditions such as intersection line-of-sight setbacks, light standards, fire hydrants, sidewalk canopies and awnings and subsurface utilities.

E. Entry Plazas

Planting design is encouraged for separating vehicles and pedestrians. Integration of bus stops and pedestrian queuing areas into the plaza design is also encouraged.

Planting designs and walkway layouts are encouraged to create recognizable pedestrian patterns and discourage pedestrian encroachment into planting areas; reinforce public gathering spaces; and integrate joint-use projects into the station plaza area.

F. Station/Park-and-Ride Lots

Provide ornamental landscaping with permanent irrigation for station and park-and-ride areas.

Trees shall be planted in parking areas between stalls, in the parking row-end islands or in stalls specifically designed for planting as determined by the Designer, in order to reduce the monotony of parking lots and to provide a comfortable transition between the car and the station. Entrances to stations may be emphasized by grouping trees in strong masses. Trees shall be located, as appropriate, to provide useful shade in waiting, circulation and parking areas.

In tree selection, avoid messy trees that produce seed pods or heavy droppings, poisonous trees, or trees with thorns near stations and paved areas.

Existing plant material shall be preserved, as appropriate.

At stations with park-and-ride facilities or major bus transfer facilities, trees shall be located, as appropriate, around the perimeter and along pedestrian walkways leading to the station to achieve a visual impact and to emphasize the pedestrian routes to the station.

A tree border for screening, glare prevention and general landscape planting shall be provided around the periphery of park-and-ride lots. Plantings shall not obscure visibility from the street nor provide concealed areas within the parking lot.

G. Metro Rail At-Grade Right-of-Way

Metro Rail at-grade right-of-way shall receive less landscape emphasis than stations and park-and-ride facilities.

At-grade right-of-way landscape treatment shall be consistent with stated objectives with an emphasis on minimal maintenance and safety.

Landscaping shall be used on sound and retaining walls, as appropriate, for graffiti management. If sound walls are located inside of the property line, both sides of the wall shall be planted as appropriate.

Avoid obstructing ROW signs and signals with low branching trees, large shrubs, or other plantings.

At-grade ROW landscape treatment shall utilize drought tolerant native plants. Provide permanent irrigation system even for native plants.

No planting inside the trackway envelope. Ornamental planting on ROW sections, if at all, should be outside the track corridor barrier.

Whenever feasible native vegetation shall be preserved.

Planting designs shall emphasize simplicity rather than complexity. Mass planting of limited numbers of species is encouraged. Integration with existing acceptable plant materials and vegetation in adjacent areas shall be emphasized.

H. Maintenance

Landscape designs shall minimize maintenance requirements. Lawns and other plant material requiring intensive maintenance shall not be used. Maintenance-intensive treatments such as formal hedges and espaliers should be avoided. Also avoid plants that attract rodents and “nuisance” insects, such as white flies, stain pavement or produce excessive litter. Variance is required if a proposed design will require maintenance that reduces revenue services.

Plant selection shall consider plant size at maturity; correct spacing of plant material minimizes pruning requirements. Planting design shall consider ease of access by maintenance crews to plant materials during Metro Rail System maintenance hours. Areas which require erosion protection shall be landscaped with low-maintenance ground covers.

I. Tree Protection and Support

Existing trees that are healthy and attractive shall be preserved whenever possible. All existing trees on site shall be indicated in the contract documents and appropriate protection during construction shall be specified for those that remain.

Tree grates shall be provided where necessary to prevent compaction of the soil surface. Tree grates shall be sized according to tree growth requirements. Tree grates shall be designed to support the weight of one wheel of a service vehicle, and to allow unimpeded pedestrian movements.

Tree guards are to be considered at locations such as subway plazas and station platforms to prevent damage to trees from vehicles or pedestrians.

All trees in pedestrian areas shall be staked. For non-pedestrian areas, trees less than 36" box size shall be staked. Trees greater than 36" box size shall be guyed.

Make sure trees have adequate space around the roots and select trees carefully. A small tree well in a sidewalk or parking lot island will not accommodate a large shade tree. The street, sidewalk, paved surface, wall, or curb will eventually crack and buckle.

J. Irrigation

All planting areas shall be irrigated during the establishment period. A permanent automatic irrigation system shall be installed at all stations, park-and-ride and kiss-and-ride facilities, at station plazas and along planted sound and retaining walls using reclaim water supply if available in the area. Other, less visible locations may be designed without permanent irrigation systems if special care is taken to select plant materials that are adaptable to natural rainfall conditions in southern California. Water requirements shall be considered in the selection of all plant materials. Watering requirements of each plant type must be considered when grouping plants. Design should focus on long-term low water usage, conserving water resources, and using reclaimed water system for irrigating if available. The Designer shall locate irrigation components to minimize vandalism but ensure easy access to maintenance personnel. The goal should be to achieve planting survivability with natural precipitation and a minimum of supplemental irrigation. Install water conserving irrigation hardware and utilize smart water management technology. No sharing of water sources (meters and irrigation controllers) with adjacent city properties.

Consider minimal use of drip irrigation system where there may be damage due to foot traffic. Where possible, consider the use of a conventional overhead irrigation system with a mulching program around station areas.

If the entire railroad ROW is to be landscaped, and if there is potential future source of reclaimed water, landscape irrigation system lines and above-ground hardware and appurtenances should be "purple pipe".

6.7 MATERIALS

6.7.1 Introduction

The purpose of this section is to specify basic requirements and criteria established for the finish of public areas within the Metro Rail System. While convenience, comfort, and attractiveness will be considered in the selection and application of these finishes, the Designer shall assure that the goals of safety, durability, and economy are achieved.

6.7.2 Basic Goals

A. Safety

1. Fire Resistance and Smoke Generation

Reduce hazard from fire by using materials with minimum burning rates; smoke generation, and toxicity characteristics for station finishes, consistent with requirements of Metro Fire/Life Safety Criteria.

2. Attachment

Eliminate hazard from dislodgement due to temperature change, vibration, wind, seismic forces, aging, or other causes, by using proper attachments and adequate bond strength.

3. Slip-resistant walking surfaces

Increase pedestrian safety, in compliance with accessibility requirements by using floor materials with slip-resistant qualities. Entrances, stairways, platform edge strips, sidewalk grates, and areas around equipment should have high slip-resistant properties.

The following static coefficients of friction as defined in ASTM C1028 shall be provided as a minimum:

Coefficient Of Friction

- Public horizontal surfaces 0.6 min. per ADAAG
- Non-public horizontal surfaces, exterior 0.6 min.
- Non-public horizontal surfaces, interior 0.5
- Platform edge strips Textured visually-contrasting material conforming to ADAAG Section 705, Detectable Warnings and 406, Curb Cuts, and California Code of Regulations (CCR), Title 24
- Stairs, ramps, sloping sidewalks 0.8 per ADAAG
- Area around equipment 0.6

B. Durability

Provide for long and economical service by using materials with wear, strength, and weathering qualities consistent with their initial and replacement costs, and their location in the station. The materials must maintain their good appearance throughout their useful life. Materials should be colorfast.

C. Ease of Maintenance

1. Cleaning

Reduce cleaning costs by using materials which do not soil or stain easily, which have surfaces that are easy to clean in a single operation, and on which minor soiling is not apparent. Materials shall

be cleanable with standard equipment and cleaning agents. Do not use white or light color floor finish.

2. Repair or Replacement

Reduce maintenance costs by using materials which, if damaged, are easily repaired or replaced without undue interference with the operation of the Metro Rail System. Spare materials shall be provided for tile and other unit materials in a quantity of approximately two percent of the total used. Artist to provide replacement and maintenance requirement information.

D. Resistance to Vandalism

Provide materials and details that do not encourage vandalism, that are difficult to deface, damage or remove.

All surfaces exposed to the public are to be finished in such a manner that the results of casual vandalism can be readily removed with normal maintenance techniques. Station Designers are required to describe procedures for removal of more serious defacement for each finish in public areas and within nine feet of the floor surface, as part of the Maintenance Manual.

A six millimeter thick anti-graffiti sacrificial film shall be installed for protection of glass surfaces (e.g. display or map cases) and anti-graffiti coatings for protection of concrete surfaces as well as other finish material such as tile, steel shall be installed with Metro recommended products as indicated in Metro Baseline Specifications.

E. Aesthetic Qualities

Create a feeling of warmth, attractiveness, quality, and design excellence to instill civic pride in the facility.

F. See Sustainable Design Guidelines in Design Criteria Section 2, Environmental Considerations.

6.7.3 General Criteria

Certain general criteria for finish materials are indicated to achieve the goals outlined above as well as those which would result in a high level of illumination, good cleanliness levels, and the appearance of high cleanliness.

A. Surface

Applied materials shall be hard, dense, non-porous, non-staining, acid and alkali resistant, for long life and low maintenance. Surfaces within reach of the public, up to 9 feet above the floor level may be finished with applied materials.

B. Color

Floor finish colors shall not be white or light color. However, light colors on wall finishes will aid in maintaining high illumination levels. Colors with sufficient contrasts and accents may provide visual interest and warmth and may conceal minor soiling. See Electrical Criteria, Article 7.13, Lighting for guidance on surface reflections.

To provide uniform contrast ratio in all Metro Rail System Stations a six inch wide black porcelain tile pre-warning strip will be placed adjacent to the 24 inch yellow, tactile platform edge paver, in compliance with ADA and Title 24 (CCR), as indicated in Metro Rail Architectural Standard Drawings.

The platform edge standard design will be consistent with current rules and regulations of ADAAG, and Title 24 (CCR).

To provide yellow color detectable directional tile per regulations of ADAAG, and title 24 (CCR) as indicated on Metro Rail Architectural Standard and Directive Drawings.

C. Texture

Smooth surfaces are preferred over rough ones for ease in cleaning and because they are less prone to catch settling dust. Rough surfaces are desirable where a slip-resistant feature is important, and are acceptable where surfaces are difficult to reach and are therefore unlikely to be cleaned very frequently. A rough surface may hold dust without being visually apparent.

D. Unit Size

Units should be large enough to reduce the number of joints yet small enough to conceal minor soiling and scratches and to facilitate replacement if damaged. Monolithic materials may be used if they have inherent soil hiding characteristics that can be easily repaired without the repair being noticeable.

E. Joints

Since joints are a major source of maintenance problems, joints should be small, flush limited in number and the best possible materials. Horizontal joints should not be raked but should be flush or tooled concave. Monolithic materials should have adequate control joints and expansion joints at the proper spacing in order to prevent surface cracking. Floor finish joint width shall comply with Title 24 CCR (1/4" minimum to 3/8" wide maximum). Floor finish joints shall comply with current Federal and State Accessibility Standards.

F. Cost

Within the station budget, materials shall be selected for long life, low maintenance, replacement considerations and overall aesthetic and functional qualities.

G. Availability

Materials should be selected which are readily available. Domestic products shall be selected unless the product is not available within the U.S.

H. Nonproprietary Materials

In order to obtain competitive bids and to comply with Federal Regulations, proprietary items should only be used where it is established that no other material would meet the particular design requirements.

I. Installation Standards

Materials shall be detailed and specified to be installed in accordance with industry standards and manufacturer's printed directions.

J. Flammability

Interior finishes shall meet requirements of the California Building Code (CBC), Chapter 8, and the Fire/Life Safety Criteria.

1. Finishes for all protected exitways shall be Class I as defined by the CBC and Class A as defined by NFPA 101. In underground stations, platforms, concourses, corridors, stairways, and vestibules shall be considered exitways.

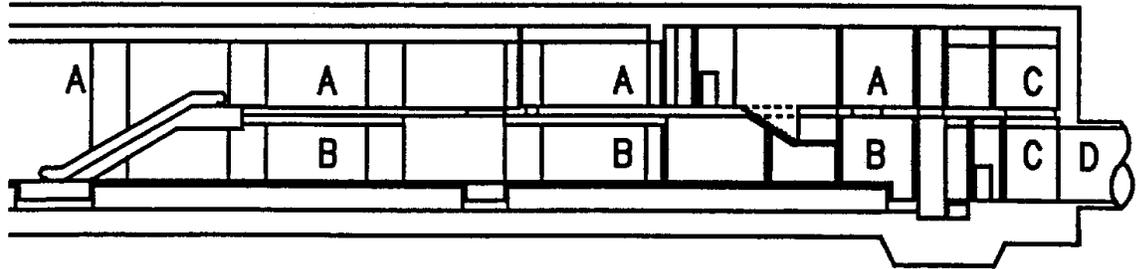
2. Finishes in all other areas shall be Class II as defined by the CBC and Class B as defined by NFPA 101.

3. Combustible adhesives and sealants may be used when they meet the requirements stated above.

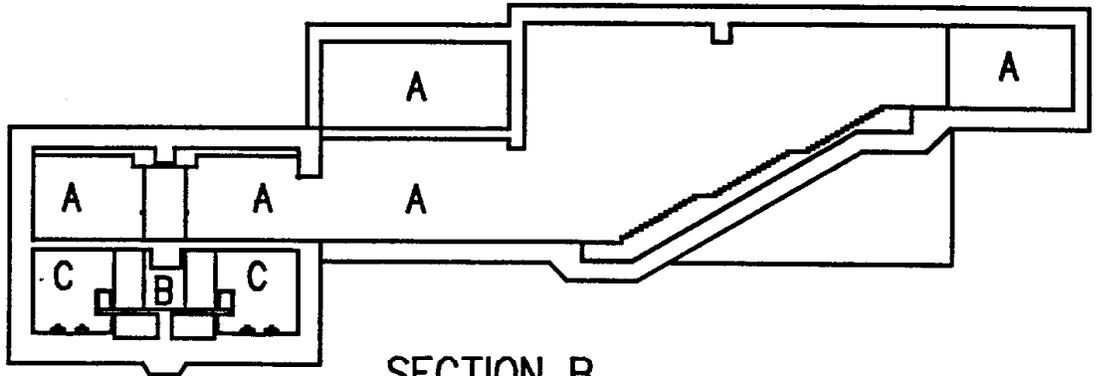
K. Pressure Resistance Criteria

Miscellaneous items in underground structures are subject to air pressure caused by running trains: Ceiling, wall finishes and doors shall meet the pressure resistance criteria. See Figure 6.1.

FIGURE 6.1 - TRANSIENT AIR PRESSURES (CONTINUED)



SECTION A



SECTION B

LEGEND

TYPE	PRESSURE LOAD (PSF)	
	POSITIVE	NEGATIVE
A	10	10
B	30	10
C	70	30
D	70	70

POSITIVE PRESSURE - PUSH AWAY FROM TRACK
 NEGATIVE PRESSURE - PULL TOWARD TRACK

6.7.4 List of Finished Materials

This list will apply to all public areas in the station. For the use of items listed as "Acceptable," installation is subject to location and environmental considerations.

A. Floor Materials - Finish to Provide Slip-Resistant Surface

1. Acceptable

a. Monolithic Materials

- 1) Architectural concrete - with special dense aggregate finish concrete in platform areas for LRT at-grade and aerial stations and also for LRT and HRT Plazas, and with appropriate concrete finish to provide slip-resistant surface in ancillary areas. Hardened finish where shown on Palette Schedule.
- 2) Acid-resistant applied coating - for application in Battery Rooms.

b. Unit Materials (large units - min. 12 inches x 12 inches x 1/2 inch)

- 1) Precast concrete paver – special architectural dense aggregates for LRT at-grade and aerial stations.
- 2) Vinyl composition tile – ancillary areas only

c. Unit Materials

- 1) Natural granite. Mandatory public stairs for underground stations
- 2) Manufactured granite
- 3) Terrazzo - precast only, up to 24 inches x 24 inches, slip-resistant texture, with sealed surface
- 4) Porcelain tile
- 5) Paver brick – dense, hard at plaza area only
- 6) Cement terrazzo (special/hard aggregates, abrasive aggregates and installation control); thick set installation at plaza area only

2. Not Acceptable

a. Monolithic Materials

- 1) Bituminous toppings
- 2) Synthetic resin toppings
- 3) Resinous Terrazzo Tile

b. Unit Materials

- 1) Resilient tile and sheet products - in public areas

- 2) Wood products
- 3) Marble
- 4) Mosaic tile
- 5) Glazed ceramic tile
- 6).Glazed porcelain tile
- 7) Architectural concrete and precast concrete pavers for underground stations' public areas.

B. Wall Materials

1. Acceptable

a. Monolithic Materials

- 1) Concrete with sealers (with sufficient surface texture to conceal minor soiling and damage without complicating maintenance procedures, or constituting a hazard to clothing or skin of patrons).
- 2) Form liner or rustication joints in train room walls.
- 3) Safety laminated glass panels

b. Unit Materials - minimum 6 inches x 6 inches unless used for limited feature strips.

- 1) Concrete masonry units – nonpublic areas only in underground stations
- 2) Reinforced cast-in-place concrete underground shall be used for underground trainway walls because of air pressure build-up and for exterior walls of shafts and all bearing walls
- 3) Stainless steel panels

c. Unit Materials (Underground Station Only)

- 1) Unglazed and glazed ceramic tile, and vitreous mosaic tile
- 2) Ceramic facing veneers
- 3) Glazed and unglazed brick
- 4) Precast concrete
- 5) Structural glaze faced concrete masonry units
- 6) Porcelain enamel steel panel – noncombustible assembly
- 7) Crystalized glass panels
- 8) Granite
- 9) Metal cladding with powder coated finish

- d. Surface Applied Finishes
 - 1) Clear sealer - on concrete surfaces or concrete masonry units.
- 2. Acceptable for use over 9 feet above floor (Underground Station)
 - a. Rough or textured concrete
 - b. Acoustic panels - in passageway areas only.
- 3. Base Materials
 - a. Ceramic tile - Cove
 - b. Quarry tile - Cove
 - c. Granite - Cove
 - d. Porcelain tile - Cove
 - e. Rubber/Vinyl - Cove in ancillary areas only
 - f. Acid-resistant applied coating.
- 4. Not Acceptable
 - a. Monolithic Materials
 - 1) Rough concrete (within 9 feet of floor immediately adjacent to public circulation and flow areas)
 - 2) Plaster
 - 3) Exposed steel
 - 4) Curtain wall assemblies.
 - b. Unit Materials
 - 1) Gypsum board (acceptable for 2-hour rated enclosure at smoke exhaust duct where passing through ancillary space)
 - 2) Plastics
 - 3) Wood
 - c. Surface-Applied Finishes
 - 1) Vinyl wall covering
 - 2) Paint
 - 3) Special epoxy coatings.
- C. Ceiling Materials
 - 1. Acceptable
 - a. Monolithic Materials
 - 1) Smooth concrete
 - 2) Acoustic materials (vermiculite plaster, etc.) sprayed onto mechanically fastened expanded metal lath.

- b. Unit Materials
 - 1) Non-corrosive linear metal panels with applied coating or natural brushed finish with wrapped acoustical material
 - 2) Non-corrosive metal panels with applied coating or natural brushed finish with large perforations with wrapped acoustical material
 - 3) Rigid, cellular glass blocks.
 - 4) Gypsum board at non-public areas only.
- 2. Not Acceptable
 - a. Surface-Applied Materials
 - 1) Gypsum plaster.
 - b. Unit Materials
 - 1) Acoustic tile (ceramic and mineral, glass and wood fiber)
 - 2) Gypsum board in public areas only
 - 3) Suspended plaster systems
 - 4) Wood
 - 5) Plastic
- D. Door Materials
 - 1. Acceptable
 - a. Flush hollow metal doors and frames:
 - 1) Public areas - alkyd enamel finish
 - 2) Nonpublic areas - alkyd enamel finish.
 - b. Wire glass at doors with vision panels
 - c. Laminated safety glass at elevator, glazed doors and hoistways
 - d. Stainless steel overhead rolling grilles
 - e. Stainless steel service gates
 - f. Stainless steel doors.
 - 2. Not Acceptable
 - a. Anodized aluminum doors and frames
 - b. Fluoropolymer finished doors and frames
 - c. All upward-acting sectional doors
 - d. All nontempered, nonsafety glass
- E. Smoke exhaust duct cladding
 - 1. Acceptable
 - a. Non-corrosive metal - natural brushed finish

- b. Non-corrosive metal with applied coating
- 2. Unacceptable
 - a. High polished stainless steel ceiling or smoke exhaust duct cladding
- F. Canopy Materials
 - 1. Acceptable
 - a. Steel, factory finished aliphatic polyurethane coated.
 - b. Laminated glass
 - 2. Not acceptable
 - a. Ordinary glass
 - b. Uncoated fabric
 - c. Ordinary plastics
 - d. Silicone or Teflon-coated fiberglass
- G. Handrails/Guardrails
 - 1. Acceptable
 - a. Underground Station
 - 1) Stainless Steel - public areas
 - 2) Painted galvanized steel - Ancillary areas
 - b. Aboveground Station
 - 1) Stainless Steel – public areas
 - 2) Painted galvanized steel – Ancillary areas
 - 2. Not Accepted
 - a. Aluminum
 - b. Uncoated steel
 - c. Uncoated galvanized steel
 - d. Wood

**TABLE 6.4
DOOR, HARDWARE, AND SECURITY SCHEDULE**

- NOTE:
 1. ALL DOORS TO BE 7'-0" IN HT.
 2. TRANSOMS TO BE 3'-0" ht.x WIDTH OF DOOR TO BE REMOVABLE. (UL APPROVED ASSEMBLY)
 3. PAIR OF DOORS
 a. 3 PAIRS OF HINGES
 b. AUTOMATIC FINISH BOLTS
 4. EMERGENCY EXIT CORRIDOR 2 HOURS RATING BEYOND PLATFORM END.
 ** UNLESS PROVIDE OFF SERVICE CORRIDOR

	PAIR DOORS	3'-6" MIN. EACH LEAF	3'-0" MIN	2'-6" MIN	SOUND RATED	AIR TIGHT	HOLLOW METAL	SHUT DOWN GRILLE/DR. CLOSER	1-1/2 PR. BUTTS MIN. NOTE	AUTO DR. BOTTOM	THRESHOLD	EXIT DEVICE	LOCK SET	DEAD LOCK	KEY - OUTSIDE	KEY - INSIDE	FIXED KNOB - IN	FREE KNOB - OUT	INTRUSION ALARM	ELECT STRIKE	SPECIAL KEY	ELECTRIC RELEASE	KEY OPERATED	POWER RATED	
ENTRANCE - EMERG. EXIT AT MEZZANINE		X				X	X	X			X														
- ROLLING GRILLE						X						X	X	X			X					X	X		FULL HEIGHT
PASSAGEWAY - ELEV. EQUIP.	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X									3'-6" DR. WIDTH MIN.
- TOILET RM.						X	X	X	X	X	X	X	X	X	X										2'-6" DR. WIDTH
- STAFF / SECURITY		X				X	X	X	X	X	X	X	X	X	X										VISION PANEL
- TRASH RM.	X					X	X	X	X	X	X	X	X	X	X										
- CUSTODIAL CLOSET	X					X	X	X	X	X	X	X	X	X	X										
PLATFORM - EMERG. EXIT GATES																									
- EMERG. EXIT DOORS	X	X				X	X	X	X	X															SEE NOTE 4
ANCILLARY - FAN & MECH. RM.	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X		X				
- ALX. POWER	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X						
- BATTERY RM.		X				X	X	X			X	X	X	X	X	X	X	X							
- TRAIN CONTROL / COMM.	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
- EJECTOR RM.		X				X	X	X				X	X	X	X	X	X	X							
- ELECT. EQUIP.		X				X	X	X				X	X	X	X	X	X	X	X						
- EMERG. EQUIP.						X	X	X				X	X	X	X	X	X	X							
- SUMP PUMP RM.		X				X	X	X				X	X	X	X	X	X	X							
- SPRINKLER VALVE RM.		X				X	X	X				X	X	X	X	X	X	X	X						
- STORAGE RM.		X				X	X	X				X	X	X	X	X	X	X							
- CHILLER RM.	X		X	X	X	X	X	X			X	X	X	X	X	X	X	X							W/ TRANSOM
- CUSTODIAL RM.	X					X	X	X			X	X	X	X	X	X	X	X							
SERVICE CORRIDOR	X					X	X	X			X	X													W/ TRANSOM
- T.P.S.S.	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X						W/ TRANSOM
- EMERG. FAN		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							W/ TRANSOM
- AIR SUPPLY/SMOKE EXHAUST	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							W/ TRANSOM
- FAN ROOM SHAFT ACCESS			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							NON-RATED
- UPE FAN RM.	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
- UPE PLENUM			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
- INCOMING ELECT. SERVICE	X	X				X	X	X			X	X	X	X	X	X	X	X							W/ TRANSOM
INCLINED LADDER ENCLOSURE		X																							

6.8 TOILET AND DRAINAGE SYSTEMS

6.8.1 Introduction

This section describes minimum standards for toilet and drainage systems at all stations.

Rest rooms shall be provided at each underground station and at terminal stations for Metro Rail use. These facilities shall be available for emergency use by the public at the discretion of Metro Rail personnel.

Public rest rooms will not be provided at aboveground stations, except as required for layover facilities.

Provisions for future installation of additional rest rooms shall be provided at staffed stations, rail interchanges and terminal stations. These facilities may be completed and available to the passengers when a clear demonstration of public needs results from actual operations and encourage installation of rest room facilities by those developments that benefit from the station's existence.

6.8.2 Basic Goals

- A. To provide toilet facilities for system staff with provisions for emergency access by patrons.
- B. To minimize maintenance, operations, and security requirements.
- C. To standardize plumbing fixtures and fittings throughout the system.
- D. To standardize toilet room accessories throughout the system.
- E. To standardize station drainage throughout the system.
- F. Provisions for individuals with disabilities.

6.8.3 Staff Toilet

- A. Each underground station shall have one staff toilet. Each such toilet shall be located within the ancillary space adjacent to the station entrance passageway. Door to facility will be locked. Emergency public access will be given by station personnel to valid ticket holders.
- B. A typical layout of staff toilet facilities is shown in Directive Drawings. Station planning requirements will, however, establish the specific layout required for each station.
- C. Provision must be made for emergency use of toilet facilities by patrons, including the disabled, subject to the controls described elsewhere in these criteria. To accommodate the elderly and the disabled toilet rooms shall meet the requirements of ADAAG and Title 24 (CCR).
- D. Staff toilet room shall be located next to the staff security room.
- E. Locate a storage room next to the staff toilet with a plumbing wall in between, so that the storage facility can be converted to a toilet in the future. Provide floor drain in storage room.
- F. Each toilet room shall have the following accessories: (See Directive Drawings.)
 - 1. Paper towel dispenser and waste receptacle, recessed type

2. Soap dispenser, recessed type
 3. Toilet tissue dispenser, recessed type
 4. Toilet seat cover dispenser and sanitary napkin disposal, recessed type.
 5. Sanitary napkin-tampon dispenser, recessed type
 6. Mirror and shelf
 7. Coat hook
 8. Grab bar
 9. Air dryer
- 6.8.4 Toilet Fixtures and Trim (See Directive Drawings)
- 6.8.5 Toilet Room Accessories
- A. General Requirements
1. All necessary items shall be fully recessed into the wall. Maximum projection from finished wall should not be greater than 5/8 inch.
 2. All accessories shall be constructed of Type 302 or 304 stainless steel, heavy gauge unless otherwise noted. Exposed surfaces shall have No. 4 satin finish.
 3. Toilet room equipment which requires manual operation by the disabled, such as toilet paper racks, towel dispensers, and disposer units, shall comply with the requirements of Title 24 (CCR).
- B. Specific Requirements
- Actual accessories to be used shall be uniform systemwide. They will be covered by a standard specification.
- 6.8.6 Drinking Fountain
- A drinking fountain will be provided in the Staff/ Security Room, and ancillary areas. No drinking fountains for public use will be provided.
- 6.8.7 Drainage in Stations
- A. Entrances
1. At entrances to underground stations, the first 25 feet (minimum) of floor under cover, should be sloped at a minimum of 1 percent, to drain toward the floor mat at the entrance.
 2. Recesses for stainless steel grating at the floor shall be provided, under cover, at all station entrances. The length of the grating should equal the width of the entrance. The width of the grating should be approximately 10 inches. Provide a drain in each recess. A recessed concrete floor trough shall be provided between the grating with the bottom surface of the concrete sloped to a drain.
 3. Access walkways to at-grade stations shall be sloped to drain positively, and shall not exceed a cross slope of 2%.
- B. Concourse
1. Except at entrances, floors should be level in the transverse direction and level or sloped to align with the structure in the longitudinal direction.

2. Provide floor drains at all hose bibb locations.

C. Platforms

1. Platforms should be level at right angles to the track and parallel with the structure in the longitudinal direction.
2. Provide floor drains at all hose bibbs located at platforms which do not slope toward trainway. Pitch floor within 3 feet 0 inches of hose bibb towards drain at 1 percent rate.

D. Roof Areas

1. Within the station, all roofs should be pitched to drain. Underground station structural ceilings shall be pitched at 2 percent minimum to provide for drainage.
2. Water should not be allowed to spill over the edge of exterior roofs, but should be carried away by concealed leaders to the storm drainage system.

6.9 SANITATION AND MAINTENANCE

6.9.1 Introduction

This section presents the general standards for station sanitation and maintenance facilities.

- A. The maintenance and sanitation concept assumes that Metro will provide all necessary maintenance equipment and facilities regardless of whether the maintenance work forces consist of Metro Rail employees or contract personnel. In either case, maintenance crews will be based at the Maintenance-of-Way Facility, and possibly at other off-station locations. Most maintenance equipment, materials and supplies will be stored in the Maintenance-of-Way Facility. Provisions at stations for maintenance personnel and for storage of equipment, material, and supplies will therefore be the minimum necessary.
- B. Station maintenance activities are classified under three general categories:
 1. Inspection and service
 2. Preventive maintenance
 3. Corrective maintenance

Work under the first two categories will be performed on a prescheduled routine basis. Work under the third category will be provided on an as-needed basis.

- C. Most station maintenance activities will be performed during revenue hours. Only those activities which would seriously disrupt revenue operations will be performed during non-revenue hours.
- D. Maintenance will be performed to those areas of station complex beyond the exterior surfaces of the station building, or buildings, including canopies and other appendages thereto, and within the boundaries of the station site.

6.9.2 Basic Goals

- A. To create easily maintained environments with high level of cleanliness throughout the system, which will instill pride and encourage the use of the system.

- B. To provide facilities for efficient maintenance program which operates at a minimum cost.
- C. To integrate maintenance elements in the stations as a part of station design, without detracting from the appearance of the stations.
- D. To provide uniform interchangeable facilities within each station or between stations where possible, to facilitate replacement of damaged items.

6.9.3 General Principles

- A. Maintenance and operation programs requiring the use of trainway areas and equipment should be avoided. Although some intrusion into the trainway may be necessary, each occasion will cause additional programming problems with revenue operations or high cost for providing services for limited times during premium time hours.
- B. Horizontal ledges should be avoided to minimize the collection of dust. Wherever possible in above-grade stations, the exposed top surfaces of outriggers, beams, parapets and window ledges, etc., shall have a minimum slope of 30 degrees to horizontal in order to prevent the collection of dust and debris and to discourage birds from roosting in station structures.
- C. Bases should be flush with wall or recessed. If recessed, configuration must not preclude the use of a vacuum scrubber to clean the floor within the recess. Provide cove base, integral with floor, not less than 6" high at all points of intersection between floors and walls, partitions, columns, and other surfaces in all public areas, and in toilet, custodial, trash, and battery rooms.
- D. Handrails, door pulls, and other protruding elements should have a 1-1/2 inch minimum clear space behind them. Handrail equipped with down light shall have air space between rail and light fixture.
- E. All station facilities and amenities should be designed and located to require limited maintenance.
- F. Signs, advertising panels, and art work should be designed and located to require limited maintenance.
- G. Cleanouts and access panels should be located inconspicuously and, where possible, placed in pipe chases and nonpublic areas. In public areas, panels shall be provided with locks.
- H. Wall mounted items of equipment, including movable equipment, should be flush. Such equipment must be accessible to persons with disabilities, including wheelchair users.
- I. Notches in walls for flush mounted equipment should not extend down to the floor unless necessary to provide access for persons with disabilities. Bottoms of such notches should be not less than 6 inches above the adjacent floor at any point. Where equipment is freestanding, it should have its own integral base fitted tight to the floor. Where equipment is grouped, flush closure strips should be used to cover spaces between units.
- J. Structural and architectural elements which must project from walls should be held at least 12 inches above the floor to facilitate cleaning. Where an element must project more than 3 inches from a wall, verify that floor and wall surfaces below or adjacent to the projecting element are accessible

for cleaning using equipment listed in the specific Metro Rail Station Maintenance Plan.

- K. Signs, handrails, benches, etc., should be securely anchored with tamperproof screws or bolts. If heads must be exposed, use flush spannerhead screws. Use Allen-head screws if heads are concealed from view.
- L. Duplex receptacles for maintenance tools at the platform area shall be installed at columns or mapcases.
- M. Separate trash receptacles are to be provided for normal refuse, recyclable newsprint or other items at designated locations.
- N. Standard trash receptacles are to be appropriately signed and installed adjacent to station entries, concourses, platforms and walkways.
- O. No ash receptacles should be placed in "Station Paid Areas" which are designated as "No Smoking" spaces. Furthermore, ash receptacles should be placed in close proximity to station entrances where "No Smoking" signs should be posted.

6.9.4 Specific Requirements

A. Entrance

- 1. Provision should be made at each entrance for a 110-volt ac waterproof outlet and a 3/4 inch hose bibb in adjacent locked stainless steel cabinets.
- 2. Trash receptacles should be located at all entrances, bus drop-off areas, Kiss-and-Ride areas.
- 3. Stainless Steel ash receptacles should be located at all station entrances.

B. Concourse

- 1. Pairs of utility outlets consisting of a 3/4 inch hose bibb and a 110-volt ac waterproof outlet shall be provided throughout public and ancillary spaces, located so that no portion of floor area is more than 100 feet from such a pair. Pairs located in public areas shall be installed in a flush mounted, two-compartment stainless steel cabinet, one compartment containing the hose bibb and the other compartment containing the electrical outlet. Hose bibs shall not be installed within any mapcase cabinets.
- 2. Metro standard trash receptacles should be located at key points where people stop; at vending machines, fare gates, seating areas, etc. There will be no ash receptacles in station paid areas, which are designated as "no smoking" spaces. Ash and trash receptacles will be furnished on a systemwide basis.
- 3. Architectural Standards and Directive Drawings indicate specific details and recommended mounting locations.

C. Custodial Room and Custodial Closet in Underground Station.

These rooms shall be located close to the elevators. Two facilities are required at each station, one at concourse/passageway and one at platform level.

- 1. Custodial Room:

Items in this area will include:

- a. Mop sink - 36 inches x 24 inches, floor-mounted with 6 inch-high rim and stainless steel rimguard, waste connection fitting.
- b. Hot and cold water, single spout with pail hook at 3 feet 0 inches above bottom of mop sink, equipped with 4 foot 0 inch length low-pressure hose.
- c. Floor drain.
- d. 110-volt ac waterproof outlet directly adjacent to scrubber storage space.
- e. Two adjustable shelves 10 feet 0 inches minimum x 1 foot 0 inches deep for storage of cleaning supplies, etc.
- f. Two adjustable shelves 6 feet 0 inches minimum x 1 foot 6 inches deep for storage of toilet supplies, etc.
- g. Ten sets of stainless steel cam-action tool holding clips.
- h. Space for double bucket and vac-scrubber machine.
- i. See Custodial Room Layout, Directive Drawings.

2. Custodial Closet:

Items in this area will include:

- a. Mop sink - 36 inches x 24 inches, floor-mounted with 6 inch-high rim and stainless steel rimguard, waste connection fitting.
- b. Hot and cold water, single spout with pail hook at 3 feet 0 inches above bottom of mop sink, equipped with 4 foot 0 inch length low-pressure hose.
- c. Floor drain.
- d. Two adjustable shelves 3 feet 6 inches x 1 foot 0 inches deep for storage.
- e. Minimum two sets stainless steel cam-action tool holding clips.
- f. See Custodial Closet Layout, Directive Drawings.

D. Trash Room in Underground Station

This room is to be located at the concourse/passageway level in close proximity to the elevator.

Items in this area should include:

1. 110-volt ac waterproof outlet.
2. Cold water hose bibb, 3 feet 0 inches above floor.
3. Floor drain under hose bibb.
4. Ventilation: Provide mechanical ventilation per Section 8.
5. Sprinkler System: (See Fire/Life Safety Criteria.)
6. 3 feet 6 inches x 7 feet 0 inches access door.
7. See Trash Room Layout, Directive Drawings.

E. Platform

1. Pairs of locked stainless steel utility cabinets shall be located throughout this area. See Section 6.9.4.B for description and spacing requirements, similar to concourse areas.
2. Metro standard trash receptacles shall be located on each platform. See Architectural Standard and Directive Drawings.

6.10 SIGNAGE AND GRAPHICS

6.10.1 Introduction

- A. Signage will be integrated into the design of station, canopies and station configuration and other structures or elements constructed as part of the Project. Signage integration at stations and the Project environment will further support the notion of identity of Metro as a transit system and be considered as an Element of Continuity. Signage, wayfinding and graphic elements will include station pylon markers, platform identification, room identification, directional signs, map cases, parking lot/garage structure and bicycle location signs and regulatory signage. All signage will be ADAAG compliant for readability and accessibility. All signage and graphics shall fully conform to the most current version of the Metro Signage Standards as developed by Metro Creative Services in the Metro Communications Department.
- B. Design and location of signs and graphics shall be uniform throughout the Metro Rail system, and shall conform to Metro Signage Standards.
- C. Messages shall be simple, clear and concise.
- D. Signs will have precedence over artwork and advertising with regard to their location and prominence.
- E. Certain signs will have priority over others, such as, signs directing passengers to normal and emergency exits. This priority may be indicated by differences in sizes, color or location.
- F. Critical signs, such as those with warning and emergency information, will provide messages in both English and Spanish.
- G. A system of symbols/pictograms has been established to identify each station on the entire Metro Rail system for informational signs therein. Locations, materials, and installations shall conform to Metro Signage Standards.
- H. There shall be a minimum of one Metro standard pylon or station marker per entrance. Location to be visible from at least two cross streets or roads bisecting the station entrance, so that passengers will recognize and locate the entrance on approach by foot or vehicle. Station pylon shall be located so as not to obstruct the view of the motorist and train operator.
- I. Messages, type faces, colors, materials of signs and station identification pylons will be uniform to assure legibility and clarity of messages for efficient functioning of the overall station as well as economical purchase of the signs and their long term maintenance per Metro Signage Standards.
- J. As the individual station design is developed, a signing layout will be prepared by the Designer in cooperation with Metro for all signs and provision of electrical power, where required, will be the responsibility of the Designer unless specifically noted otherwise and shall be reviewed and approval by Metro Creative Services.

- K. Transit Passenger Information System (TPIS) is required in all stations to provide transit information as well as limited advertising messages. In addition, the electronic display signs will provide equivalent public information to the hearing impaired. Font and visual design for Variable Message Signs (VMS) shall be per Metro Signage Standards.
- L. Artwork shall be coordinated with signing to avoid conflicts. It is the responsibility of Designer to ensure coordination with Metro Creative Services.
- M. Signage shall be located so as not to obstruct the view of motorist, pedestrian, and train operator.

6.10.2 Basic Goals

- A. To guide passengers through the system in the most efficient and least complicated manner.
- B. To provide orientation and information required by the passenger to aid directional decision-making.
- C. To provide a safe trip for passengers, and to warn passengers and non-passengers of potential system hazards.
- D. To provide fast safe exit in case of emergency.
- E. To allow passengers to know where they are and where they are going, at all times.

6.10.3 Definitions

Directly Illuminated. A sign for which special external illumination is required.

Field. The background on which the sign legend is placed.

Fixed Sign. A sign with set format which remains constant through all applications.

Indirectly Illuminated. A sign which is illuminated by ambient light. No special means of illumination is needed.

Internally Illuminated. A backlighted sign with its own internal illumination.

Legend. Graphic figures such as letters or symbols which are the language of the signs.

X-Height. The vertical height of the legend.

M-Height. Preferred mounting height from the floor or grade to bottom of sign.

6.10.4 General Requirements

- A. Signs shall conform to Metro Signage Standards and be reviewed and approved by Metro Creative Services during the design stages of the Project.
- B. Signs shall be kept to the minimum necessary for passenger guidance. Signs shall reinforce architectural elements in identifying entrances, exits, traffic routes, etc.
- C. The message on each sign will be concise, clear, and simple for easy understanding. International signs and symbols will be utilized only as necessary, and defined

- D. Signs shall occur at key points of separation and at intervals frequent enough to allow passengers to find their way confidently.
- E. Sign design shall be uniform for Metro Rail system to aid immediate recognition by the passenger of any station.
- F. Signs shall meet accessibility standards.
- G. Signs shall neither conflict with nor obstruct traffic control devices.

6.10.5 Signage System

The Designer will follow the signage system noted in the most current vision of Metro Signage Standards, both constructed/fabricated items and text, for furnishing to the Contractor for application to the project. Metro Creative Services shall review all signage related shop drawings and fabrication for approval prior to any signage applications.

6.11 STATION CONTROL

6.11.1 Introduction

This section describes the supervision, administration, security, and monitoring requirements of stations and how they may be accommodated in the station design as presently anticipated. (For further information refer to Subsection 9.7, System Safety and Subsection 9.8, System Security of Metro Rail Design Criteria.)

6.11.2 Basic Goals

- A. To provide for public safety.
- B. To ensure efficient operation of the station and to provide optimum service to patrons.
- C. To deter crime and vandalism.
- D. To accomplish the above with a minimum of manpower by utilizing automatic devices and remote control equipment.

6.11.3 Planning Considerations

A. General Considerations

1. All stations shall be designed to not require the presence of a station agent. The station shall operate unstaffed and need only be attended in case of emergency, and in those stations employing escalators with shut down capability, to activate escalators and to secure for shut down.
2. The station design should eliminate nooks, recesses, and "places to hide," wherever possible to minimize surveillance problems. Stations should be secured at their outer most points.
3. Station supervision and administration functions will be handled by remote control systems, closed circuit television, passenger assistance telephones, and public address systems.

B. Underground Stations

1. All underground station entrances, including entrances to pedestrian bridges, must be capable of being closed each day by means of rolling grills.

2. Main entrances shall be capable of remote unlocking and opening from Central Control and the station emergency management panel. This capability is provided for possible emergency requirements only.
3. Elevators will dwell at concourse level when shut down, and subject to remote unlocking and starting from Central Control and the station emergency management panel.

C. Aboveground Stations

1. Design of passenger stations shall be open, with long, unbroken lines of sight, eliminating all dark or obscure areas.
2. Any equipment or surfaces accessible to the public such as fare machines, emergency or passenger assistance telephones, shall be of rugged, vandal-resistant design.
3. Means shall be provided for two-way voice communications.
4. Illumination levels shall be selected to maintain the level of security in stations during non-daylight hours. Non-operating illumination shall be that level required to support CCTV surveillance.

6.11.4 Rail Operations Control (ROC)

The Rail Operations Control will control and monitor traction power systems, train controls, communications, and CCTV security monitoring functions. It will monitor all traction power circuits, auxiliary power circuits, patron assistance intercom, PABX telephones, electric door release, emergency fans, exhaust fans, supply fans, etc. (For more information see Section 9.1.8 Rail Operations Control).

A. Security functions of the Rail Operations Control and Transit Police Dispatch Center:

The Rail Operations Control will monitor and control all stations. Responsibilities will include:

1. Supervision of Passenger Activity
 - a. Monitoring and controlling closed circuit television equipment (CCTV).
 - b. Monitoring fare vending and fare collecting activities.
 - c. Providing information and assistance to patrons.
 - d. Acting in emergencies such as illness or assault.
 - e. Reversing fare gates and monitoring escalators as required for changing traffic flow.
 - f. Controlling entrance and exit of special personnel, disabled patrons, etc., via the elderly/disabled gate at fare gates, when fare gate System is operational. Fare Gate Control is limited to only the ability to release all gates (for Emergency Evacuations).
 - g. Monitoring and activation of elevators.
2. Supervision of Station Operation and Security
 - a. Monitoring stations for undesirable and illegal acts against patrons, Metro Rail System personnel, and station facilities.
 - b. Directing the activities of Metro Rail personnel in stations, by means of CCTV and the telephone system.

- 1) Monitoring station intrusion alarm system and card access system.
3. Transit Police Dispatch Center

The Transit Police Dispatch Center shall direct all activity of the Transit Police. This will include:

 - a. Directing, unlocking and opening of stations by Transit Police personnel at the commencement of daily operations.
 - b. Directing station close down and locking by Transit Police at the end of daily operations.
 - c. Directing activities of the particular Metro Rail Transit Police by means of a security radio system, CCTV, and Metro Rail telephone system.
 - d. Monitoring station intrusion alarm and card access systems.
 - e. The Transit Police Dispatch Center shall have CCTV call-up monitoring capability for any CCTV camera.
- 6.11.5 Staff/Security Room in Underground Station
- A. Each underground station will have a Staff/Security Room used principally by security personnel, located off the concourse/passageway. The room should be inconspicuous. The Staff/Security Room shall accommodate a desk and two chairs. The Staff/Security Room shall have a one way mirror window on the wall facing the ticketing area in Concourse Level.
 - B. The Staff/Security Room in each station shall have the necessary conduit installed to provide CCTV (intrusion alarm) monitoring capability of the individual station.
 - C. Staff/Security Room is not required for aboveground stations.
- 6.11.6 Fare Gates, Gate Telephones (G-TEL) and Fences shall be required for all Subway, Aerial and At-Grade Stations (See Section 9.2 Fare Gate)
- A. Height of fence adjacent to fare collection gates shall be:
 1. 5 feet 0 inches in all conditions.
 2. Fences shall be visually open to provide surveillance.
 - B. Portions of barriers, which are to be removed in future to accommodate additional fare gates, shall be constructed on a modular system based on the width of the fare gate unit.
 - C. Where bars, slats, or pickets are used, the maximum spacing should be a 4 inch on center opening.
 - D. Fences should be non-climbable type with horizontal members near the top and bottom only. Fence shall be maximum 5'0" high adjacent to fare gates.
 - E. Fare gate, G-TEL, and fence barrier locations and layout for Subway, Aerial, and At-Grade Stations: see Metro Architectural Standard and Directive Drawings for HRT and LRT.
- 6.11.7 Station Closedown
- A. Underground Stations

1. Means must be provided to secure underground stations when the entire system is shut down. This will occur on a daily schedule and during emergencies, after the station has been evacuated by patrons.
2. Closedowns should be in the form of roll-down grilles which are key controlled from either side of the grille dividing the entrance.
3. Each secured station must have at least one means of emergency egress.
4. Each station must have at least one access door for use by Metro Rail Personnel when the station is secured. This requirement could be combined with the emergency egress door requirement.
5. Security closure grilles should be located in such a manner as to eliminate places of concealment accessible from the street after closedown.
6. The emergency exit at all stations that is closest to the incoming electrical room shall have a direct ringdown telephone at the base of the exit.

B. Aboveground Stations

1. To the extent possible, the design of at-grade and aerial stations, shall be open, with clear lines of sight.

6.11.8 Private Entrances

Refer to Metro Adjacent Construction Design Criteria.

6.11.9 Security Alarms and Locks

All ancillary spaces within the station shall be protected by locks and/or intrusion alarms. A master Security Intrusion Alarm and Keying System will be developed by the Designer in conjunction with the Metro Design Manager.

- A. As many ancillary spaces as possible which will normally require locks shall be clustered along a corridor entered by a doorway from the station concourse. Ancillary spaces in this category are as follows:
1. Elevator machine rooms
 2. Fan rooms.
- B. The spaces indicated below if located within stations will require electronic card access control which can be provided on an access door.
1. Electrical Equipment Room
 2. Auxiliary Power Rooms and Substation
 3. Train Control and Communications Room
 4. Traction Power Substations and Battery Rooms
 5. Sprinkler Valve Rooms.
- C. Door cylinder locks to auxiliary power rooms and traction power substations will be commonly keyed, and shall be part of the station master keying system. Secure rooms will be separately keyed and access to these rooms will be monitored from the Rail Operations Control and Transit Police Dispatch Center.

- D. Station entrances locked during non-revenue hours shall be equipped with an alarm signal audible at the entrance itself and directly connected to the Rail Operations Control and the Transit Police Dispatch Center.

Included in this category are:

1. Entrances giving direct access to station free areas
 2. Entrances to pedestrian bridges leading to stations
 3. Emergency egress doors for use during non-revenue hours
 4. Metro Rail personnel access doors for use during non-revenue hours.
- E. The entrances referred to above shall have manual locking capability or card access control from either side. All entrances shall be operable by a station entrance master key or card access control except the non-revenue hour's personnel entrance which will be separately keyed. The non-revenue hours emergency egress door shall be equipped with panic hardware.
- F. Fare gates and vending machines shall be protected from tampering by an alarm signal system connected to the Rail Operations Control (ROC).

6.11.10 Security Areas

- A. Station areas have been classified by level of security as a basis for requirements for protection:
1. Level A = Open to the public during system operating hours
 2. Level B = Open to system employees at all times, and to the public under emergency, or special circumstances
 3. Level C = Controlled access for system employees only
- B. Security provisions for station areas and appropriate levels of security are as shown on Table 6.5.
- C. The station platforms shall have boarding or safety zone for off/peak hours or times of very light patronage. This boarding zone shall be within the maximum coverage of the CCTV and may be designated by signage.

**TABLE 6.5
SECURITY LEVELS AND PROVISIONS**

Item#	Item	Security Level	CCTV Surveillance	Sensing Device	2-Way Audio	Security Latching	Remote Latching
1.	Station Closure at Plaza Level	A		X		X	
2.	Entrance Elevator	A		X	X	X	
3.	Concourse Approaches	A					
4.	Concourse Free Area	A					
5.	Station Staff/Security Room	C		X		X	
6.	Fare Vending Equipment	A/C	X	X			X
7.	Toilets	B				X	
8.	Fare Gates	A/C	X				
9.	Service/Emergency Gates	A					X
10.	Concourse Paid Area	A			X		
11.	Concourse Elevator	A			X		
12.	Ancillary Space main Entrance	B				X	X
13.	Ancillary Space Doors	C		X		X	
14.	Ancillary Space	C		X	X		
15.	Openable Concourse Wall Panels	C					X
16.	Platform Edge	A	X		X		
17.	End-of-Platform Gates	C			X		
18.	Station Trackway	C	X				
19.	Parking and Bus Area	A					

For specific hardware requirements see, Materials Section 6.7.4, Table 6.4, Door, Hardware and Security Schedule.

6.12 PEDESTRIAN CIRCULATION, PARKING FACILITIES, AND SITEWORK

6.12.1 Introduction

The location and boundaries of station sites, adjacent street improvements, and station location shall be established by the Designer and set forth on the Preliminary Engineering Plans for each station. The site layout relates to the surrounding area and its traffic patterns. Provisions for handling the pedestrian and traffic flow are based on projections made by the Designer and are reflected on the General Plans. For additional information, see Civil Section.

6.12.2 Basic Goals

To ensure that site design at each station should satisfy its operational demands and integrate satisfactorily into the surrounding urban fabric. Site design adheres to the architectural concept of a systemwide cost effective approach to design. By adapting to the unique climate of Southern California, conceptually consistent design will fulfill the functional, as well as aesthetic requirements.

6.12.3 Priority Access Modes

A. General

Since all modes of access to a station cannot be given equal priorities, a hierarchy has been established, measured by the convenience of access and proximity to the station entrance(s) from the various modes.

B. Pedestrians

The pedestrian mode shall be given first priority for reasons of safety.

C. Bicycles

The bicycle mode shall be given second priority following the pedestrian mode for reasons of safety and the following: Bicycles require significantly less parking space than vehicular modes. Bicycle parking provides an alternative to boarding transit with a bicycle and discourages parking in undesignated locations. Also, bicycles are non-motorized feeder vehicles to transit that overcome the "first and last mile" challenge. Bicycles facilitate the reduction of vehicle-miles-traveled, produce zero GHG emissions, and reduce congestion.

Bicycle parking shall be as close as possible to the station entrances.

D. Buses

The public transportation network includes not only rail, but buses, and since feeder buses will play a crucial role in determining the ultimate success of rail transit, buses will be given first priority of the motorized modes of access.

Bus access to and from the site shall not be compromised by other modes of transportation.

E. Kiss-and-Ride

Kiss-and-Ride spaces allow high volumes of patrons to access stations in short period of time with relatively little special facilities provided. Kiss-and-Ride and drop off spaces convenient to the station entrance will provide incentive not to stop on adjacent public streets. Therefore,

second vehicular priority shall be given to the Kiss-and-Ride facility and Kiss-and-Ride spaces should be as close to the station entrance as possible without interfering with the bus facilities.

Waiting time in the afternoon is considerably greater since the person driving will usually arrive at the station before the transit patron. A six-minute wait (two train arrivals at three-minute headways) is average.

F. Park-and-Ride

Park-and-Ride, or long term parking, although the least efficient in terms of the physical facilities required, has proven to be a necessary facility for the success of transit systems. This facility, whether at-grade or within a structure, shall be located at a greater distance from the station entrance than other modes where site conditions allow. Whenever possible, the walking distance from the station entrance to the most remote parking space should not exceed 1,320 feet.

G. Summary

Summary of Priority Access Mode:

1. Pedestrian
2. Bicycles
3. Buses
4. Kiss-and-Ride (including taxis)
5. Park-and-Ride (including motorcycles).

6.12.4 Pedestrian Access

A. General

Pedestrian access will vary from one site to another depending on location and function of the station. In all cases, however, the pedestrian access to the station should be as direct and safe as possible, and shall be accessible in accordance with ADAAG and Title 24 (CCR).

B. Approaches

1. Pedestrian crossings at streets wider than four lanes should have a refuge area at least four feet wide between opposing lanes, and shall allow easy use by all patrons, including the elderly and disabled.
2. Pedestrian crosswalks should be emphasized with a strongly contrasting change in paving material, surface texture, or color. The width of the crossing should be at least equal to the width of the adjacent pedestrian walk, but not less than seven feet.
3. Pedestrian crosswalks shall have good visibility for both pedestrians and drivers.
4. No pedestrian walkway should have a slope greater than 5%.
5. No pedestrian ramp should have a slope greater than 8.33%.
6. Parking areas should be arranged to minimize the number of pedestrian crossings of streets and access roads which carry vehicular traffic.

C. Walkways

1. Isolated and remote or hidden pedestrian walkways should be avoided. Where avoidance is not feasible, they should be as open as possible and well lighted.
2. Effective width of exterior walks equals total width minus obstacles such as parking meters, poles, fire hydrants, trash cans, etc. An additional 1'-0" foot fringe area per side should be subtracted due to the tendency of people to avoid walking close to walls or barriers.
3. Walks should have a continuing common surface, not interrupted by steps or abrupt changes in level. Wherever walks cross other walks, driveways, or parking lots, they should blend to a common level.
4. Walkways crossing rail tracks to reach station platform shall be level and flush with the top of rail at the outer edge and between rails, except for a maximum 2-1/2 inch gap on the inner edge of each rail to permit passage of wheel flanges. Such crosswalks, which for obvious reasons cannot be provided with either curbs or railing, shall be defined by a continuous detectable warning strip 36 inches wide and in compliance with ADAAG Section 705, Detectable Warnings and 406, Curb Ramps, and Title 24 (CCR).
5. Walkways crossing or adjoining vehicular traffic which, similarly, cannot have curbs or railings between the pedestrian area and the vehicular area. The boundary between the areas shall be bounded by a continuous detectable warning strip which is 36 inches wide. The detectable warning to be in compliance with ADAAG Section 705, Detectable Warnings and 406, Curb Ramps, and Title 24 CCR.
6. The recommended width of pedestrian walkways shall be as follows:

	<u>Preferred</u>	<u>Minimum</u>
• Walkways over tracks	15'-0"	10'-0"
• Walkways through bus stop areas	12'-0"	8'-0"
• Walkways adjacent to long-term parallel parking	8'-0"	6'-0"
• Walkways adjacent to short-term parallel parking	10'-0"	8'-0"
• Crosswalks	12'-0"	10'-0"

7. Warning signs or signals shall be provided on Pedestrian gates at crossings of light rail and/or railroad tracks, as well as adjacent roadways in accordance with Traffic Control section of this Criteria.

6.12.5 Bicycle Access

A. General

Bicycle access will vary from one site to another depending upon site specific characteristics. In all cases, bicycle access shall be as direct and safe as possible.

1. Provisions shall be made for access to and from stations by bicycle, including bicycle parking, wayfinding signage within Metro property, and other facility design elements at station sites.

B. Bicycle Parking

1. Facility Types and Bike Module Floor Plan - Bicycle parking shall be integrated into the station area site at locations directly accessible to station entrances and visible to passers-by for natural surveillance. Bicycle parking shall consist of the following:

- a. Free Bicycle Parking – An inverted-U bicycle rack that allows two (2) bicycles to be securely affixed to the rack with a personal bike lock on a first-come-first served basis.
- b. Paid-Secure Bicycle Parking – Requires a fee payment for the storage of a bicycle in a secure-access, enclosed area. Two types of paid-secure bike parking are:
 - 1) A bicycle locker allows for the secure-access and storage of a single (1) bicycle to a registered user. Station location and climate elements may determine the material/paint and finish of the locker. Where lockers are directly exposed to the outside elements, stainless steel finish may be selected as an option. See Metro Bicycle Locker Specifications and consult the Metro Bike Program.
 - 2) A high capacity bicycle parking facility allows for the storage of multiple bikes locked to bicycle racks (tiered and/or inverted-U) with a personal bike lock inside an enclosed, “shared” area that is securely-accessed by registered users. Consult the Metro Bike Program for developing this design.
- c. Bike Module Floor Plan – Refer to AS-013 Standard Drawing when designing bicycle parking facilities and space requirements. Deviations or variations must be approved by the Metro Bike Program.

2. Required Number of Bicycle Parking Spaces: For each station, bicycle parking spaces shall be provided for current and future demand for both free and paid-secure bike parking based upon projected ridership:

- a. The following formula and guidance shall be used:
 - 1) Bicycle Parking Formula
 - a) Current demand = 1.25% times peak ridership
 - b) Future demand = 2.5% times peak ridership

- 2) The number of free bicycle parking (racks) equals 60% of the required spaces divided by 2. Apply to current and future demand total.
 - a) The minimum number of bike racks provided is six (6).
 - b) Bike racks shall be provided to meet current demand and space shall be provided for expansion to meet future demand. See Metro Architectural Standard Drawing AS-013 for bicycle locker module floor plans.
- 3) The number of paid-secure bicycle parking spaces equals 40% of the required spaces. Apply to current and future demand total.
 - a) Bicycle lockers shall be grouped in $\frac{1}{4}$ pie, $\frac{1}{2}$ pie or full configurations. See Metro Architectural Standard Drawing AS-013 for bicycle module floor plans. The number of lockers provided shall be rounded up to allow the installation for completing any of these configurations.
 - b) The minimum number of paid-secured bike parking spaces shall be eight (8) lockers.
 - c) If the number of future paid-secured bike parking spaces equals 16 or less, bicycle lockers shall be provided to meet current demand with floor area space set aside to meet future demand. See Metro Architectural Standard Drawing AS-013.
 - d) If the number for future paid bike parking is between 16 and 32, lockers shall be provided to meet current demand and floor area space shall be set aside to accommodate the future installation of a high capacity bicycle parking facility.
 - e) If the number of future paid-secure bike parking spaces equals 32 or more, a high capacity bicycle parking facility shall be provided.
 - f) Where space permits at park-n-ride, gateway, and terminus stations, the minimum floor area for a high-capacity bicycle parking facility shall be 60 feet by 26 feet. A concrete pad with utility stub outs shall be provided.
3. Siting Requirements: Bicycle parking shall be located as follows:
 - a. Designer to arrange bicycle parking based on site and design requirements specified and approved by the Metro Bike Program.
 - b. Free bicycle parking spaces shall be located within 50 feet of the station entrance.
 - c. Bicycle lockers can be located separately at a further distance within easy access to and visual site of the station.

- d. At park-n-ride lots, bicycle lockers and high capacity bicycle parking facilities shall be located no further away than the nearest car parking space.
- e. Design natural surveillance settings for bicycle parking and provide appropriate lighting levels.
- f. Designer to integrate bicycle parking footprint within the surveillance parameters of station security cameras (CCTV).
- g. Within station area, designer to integrate directional signage to bicycle parking. Outside of station area, including approaches such as bicycle path, bicycle (and pedestrian) safety signage must comply with Caltrans adopted CA MUTCD (Manual of Uniform Traffic Control Devices).

C. Approaches and Access

1. Where crossings are required, bicyclists shall be considered along with pedestrians at all intersections.
2. Bicyclists should not be required to dismount. However, in areas where bicyclists have high encounters with pedestrians, bicyclists shall be required to yield. See MUTCD R9-6 for standard signage. Example is a shared use path.
3. Motorists yield signs should be installed at all crossings.
4. All railroad crossings shall be made as bicycle safe as possible.
5. Access to a station can be by all streets as bicyclists have equal rights to the road per CVC 21200 and/or bicycle path (Class I), on-street bicycle lane (Class II), signed bicycle route (Class III), and bicycle detection at signalized intersections. See CA Highway Design Manual Chapter 1000 and MUTCD.
6. Bicycle Paths
 - a. Where space is available a 17 foot wide Class 1 bicycle (12 foot) and pedestrian (5 foot) path shall be provided as an integral part of the project. The bicycle path shall be a linear design with minimal meandering radii except where intended to reduce speed at locations with potential conflict and poor sight lines.
 - b. Where space is limited a 12 foot Multi-Use path is acceptable.
 - c. Where bicycle paths begin/end in station areas where pedestrians are encountered they shall remain separate. When separation is not possible, bicyclists are expected to walk their bicycles.
 - d. Turning radii shall be 15 feet minimum with 30 feet desirable.
 - e. Provide appropriate bicycle signage for bicycle path Manual on Uniform Traffic Control Devices (MUTCD). Provide wayfinding signage on bicycle path to station and major destination and activity areas.

7. The criteria for “Walkways” (ref. 6.12.C1-7) of 12 feet or more apply to bicyclists as well as pedestrians and can be used as a shared use path.

6.12.6 Vehicular Access

A. General

1. Entrances to sites shall be from secondary roads where possible, with provision for queuing space provided at their intersections with arterial roads.
2. Separate access points into the site from the same street shall be at least 150 feet apart.
3. Use of residential streets for entrance sites shall be avoided if possible. If residential streets must be designated as access roads, provisions must be made to mitigate impact to local residential traffic patterns.

B. Separation of Access Modes

Separation of vehicular modes of access shall be provided whenever possible due to the differing circulation needs and priorities assigned to buses, Kiss-and-Ride, and Park-and-Ride.

6.12.7 Bus Facilities

A. General

Uses shall be given priority in terms of vehicular access.

B. Bus Lanes

1. Bus lanes shall be one-way only through the station site.
2. Bus lanes shall be 20 feet wide minimum to allow buses in motion to pass stalled buses.

C. Bus Bays

1. Sawtooth bus bays may be used in off-street bus terminals only.
2. Bus bays shall be designed to allow loading and unloading of passengers from the right side of the bus to pedestrian paths.
3. Bus bays will be oriented so that bus patrons do not need to cross traffic to reach the station entrance.

D. Free Body Transfer

1. Free body transfer is the term used for separate and unrestricted access to and from stations to the bus areas.
2. If Metro decides to implement free body transfer, since fares are not collected at these points, fare gates or some form of barrier outside of the station entrance must be provided to separate the bus passengers from other transit patrons who will be paying fares or using transfers.

6.12.8 Kiss-and-Ride Facilities

A. General

1. Convenience, safety and appropriateness to the overall site and neighborhood are prime design objectives.
2. Kiss-and-Ride facilities shall have second priority in vehicular access and where possible should have separate access points.

3. If provided, must have a designated area for persons with disabilities as specified in the ADAAG.

B. Access Roads

1. Access roads shall be single lane, yet allow space to maneuver around a stopped vehicle.
2. When possible, the Kiss-and-Ride vehicle should be able to recirculate on-site in the event a space is not available.
3. Kiss-and-Ride traffic shall not be routed through the Park-and-Ride areas.

C. Configuration

1. When possible, Kiss-and-Ride spaces shall be oriented so that the waiting driver can watch the station exit. See Civil Criteria for Parking Stall Dimensions.
2. Although drive-through spaces promote better circulation, the fact that many people will exchange seats with the initial driver and that Kiss-and-Ride spaces will be used for short-term parking (probably metered) during the nonpeak hours, site constraints will dictate whether drive-through or dead-end spaces are provided.
3. Drop off zones should be incorporated into the Kiss-and-Ride areas to promote better a.m. services and for taxis when they cannot use Kiss-and-Ride spaces in the nonpeak hours.

6.12.9 Park-and-Ride Facilities

A. General

1. Park-and-Ride facilities shall be provided at designated stations. The amount of parking space at a particular station will depend upon the traffic potential, the ability of the street system to feed the station, and availability of land. (See Preliminary Engineering Drawings for specific station requirements.)
2. Parking facilities may be at-grade, at-grade initially with provision for structured parking in the future, or structured parking with expansion capability. Refer to station-specific Plans for Park-and-Ride requirements.
3. If paid parking is incorporated in the Park-and-Ride areas, payment for parking should be made when the vehicle exits the area or by some metering method. Though installation of control devices may not be made initially, the ability to have paid parking at or near the parking stalls or upon exit must be designed into all Park-and-Ride facilities.
4. The facilities for Park-and-Ride should be designed for self-parking.

B. At-Grade Parking

1. Large parking lots should be subdivided into sections to reduce the scale. Walkways and landscaping may be used for this purpose. However, vehicular movement from each section to the next shall not be restricted.

2. Although landscaped, the parking areas should be open enough to maintain good surveillance.

C. Parking Structures

1. Parking garages shall be concrete structures and conform to the criteria set forth in Paragraph 6.12.9.A.
2. Space shall be provided for minimum two (2) elevators in the event the parking structures exceed 3 levels (2 levels above-grade).
3. Elevator locations shall be as close as practical to the station entrance.
4. Parking structures shall conform to the following:
 - a. Minimum vehicular clearance height 7 feet 0 inches
 - b. Ramp Grades per California Building Code (CBC) and City requirements
 - c. Width of entrance/exit lanes 12 feet
 - d. Aisle turning radii 16 feet inside, 30 feet outside
 - e. Curb height 6 inches.
5. Parking garages that include parking for Metro transit customers shall comply with signage and wayfinding in conformance to Metro Signage Standards (refer to Section 6.10 Signage and Graphics).

6.12.10 Facilities for the Elderly and Disabled

A. General

1. These provisions are intended to make all station sites and facilities used by the public accessible to and functional for the elderly and disabled.
2. Parking spaces as close as practical to the station entrance should be set aside and identified in the Park-and-Ride area for use by individuals with physical disabilities.
3. See Civil Criteria for additional requirements.

B. Parking Facilities

Accessible parking spaces shall be provided in accordance with ADAAG Sections 502 and 208, Parking Spaces, and Title 24 (CCR).

Accessible parking spaces shall be located as near as practical to a primary entrance to a facility (building or boarding platform). The space shall be located so that a person with a disability does not wheel or walk behind parked cars other than his/her own. Pedestrian ways shall be provided so as to ensure an accessible pathway from each such parking space to the facility; walks and sidewalks shall conform to ADAAG Section 403, Walking Surfaces.

When parking is provided for patrons, employees, or visitors, the minimum number of accessible spaces required per ADAAG is as follows:

TABLE 6.6

NUMBER OF ACCESSIBLE PARKING SPACES

<u>MINIMUM TOTAL NO. OF PARKING SPACES</u>	<u>SPACES REQUIRED</u>
1 to 25	1
26 to 50	2
51 to 75	3
6 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus 1 for each 100 over

Van-accessible parking spaces shall be provided in conformance with ADAAG and Title 24, Section 3107.1(b)2.

The requirements in the ADAAG shall also be met for other factors such as signage, minimum dimensions of accessible spaces, slope of parking surfaces, and entrances/vertical clearances for parking structures.

C. Walkways

1. Ramps and curb cuts shall be provided as required to provide safe, smooth transition of finish grade, and convenient circulation by the patrons with disabilities to and from the station.
2. For details of curb cuts, refer to Title 24 (CCR) and Caltrans Specifications, and to ADAAG Section 406, Curb Ramps, of ADA Accessibility Guidelines.

6.13 VEHICLE DATA AND CLEARANCES (SEE DIRECTIVE DRAWINGS)**6.14 VERTICAL CIRCULATION**

6.14.1 Introduction

This section lists the main principles and standards relevant to the design of vertical circulation including escalators, elevators, stairs, and pedestrian ramps.

- A. All stations will require some form of vertical circulation, in the form of ramps, stairs, escalators and elevators.
- B. Escalators and stairs must be so situated that they carry passengers directly to the platform at a location convenient for boarding their particular train. Changes of direction should be avoided when possible. These vertical elements must be strategically located at all levels to make this direct route possible.
- C. Ultimate quantity of stairs and escalators required in the foreseeable future shall be determined. Even though only some of these escalators will be installed when the system opens to accommodate Design Year loading, the station design must be such that it will permit the ultimate quantity to be installed.
- D. At underground stations, elevators from street level to concourse level, and from concourse level to platform level, and for aerial stations elevator from street to platform, will be provided as required to make the system accessible to the disabled, and for use by Metro Rail personnel.
- E. Vertical circulation elements shall be accessible in compliance with relevant ADAAG and Title 24 (CCR) requirements.
- F. At-grade stations shall have, in order of preference, sloping sidewalks, ramps, and/or stairs. Besides stairways, grade-separated or aerial stations, depending on height, will require other vertical circulation elements such as elevators or escalators or both.

6.14.2 Basic Goals

- A. Safety, achieved through proper relationship of basic vertical circulation elements and the details of construction.
- B. Maximum convenience for patrons, achieved through the establishment of uniform circulation patterns throughout the system.
- C. Comfort, achieved through proper sizing and layout of the vertical circulation elements.
- D. Facilities designed to provide for the patrons with disabilities.
- E. Standard design to facilitate maintenance.
- F. Interim maintenance and warranty maintenance scope of work must include the following. Required maintenance shall be of the same standard as all other Metro transit elevators and escalators, and shall include Metro's standard maintenance check charts as shown in Attachments C and D. The interim and warranty maintenance scope of work shall also cover all repairs and damages above and beyond regular maintenance including vandalism for the period of one year beginning with ROD.

6.14.3 Station Layout Requirements

- A. All stations must have at least one main accessible entrance/exit to the street level plus either one additional entrance/exit for regular use or one emergency exit.
- B. Where changes in level occur escalators and stairs shall be provided in accordance with the following minimum criteria: Two (2) stairs and two (2) escalators.
- C. Additional stairs and escalators shall be provided between the platform and concourse and between the concourse and street to clear the platform of detraining passengers prior to the arrival of the next train.
- D. The capacities of vertical circulation elements shall be assumed as follows:
 1. Escalators: 48 inches nominal width:
 - a. Per Exit Lane "Up" Direction capacity - 35 ppm Travel speed - 50 fpm
 - b. Per Exit Lane "Down" Direction capacity - 40 ppm Travel speed - 60 fpm
 2. Stairs and Ramps Over 4 Percent Slope: 22 ppm (per 22 inch-wide exit lane).
 3. Horizontal Corridors and Ramps under 4 Percent Slope: (per 22 inch-wide exit lane). Per Exit Lane capacity - 50 ppm Travel speed - 200 fpm.

Note: For ramps and horizontal corridors, a 1 foot 0 inch buffer space shall be provided at side walls, and may not be considered as exit lane space.
- E. An unobstructed run-off or queue space shall be provided at each end of all stairs and escalators. Where stairs and/or escalators oppose one another at the same level, the total unobstructed run-off/queue space may be reduced by 25 percent. (See Table 6.3 herein).
- F. All vertical circulation elements shall comply with the requirements as referenced under Codes Section; and under Metro Fire/Life Safety Criteria.
- G. Elevators or ramps will be required in all stations, from the street level to concourse level and from concourse level to each platform level, to provide access for maintenance equipment and those patrons who would have difficulty using stairs or escalators.
- H. Handrails for ramps shall be continuous, 34 to 38-inches in height.
- I. Guardrails for ramps shall be continuous, min. 42-inches in height.

6.14.4 Stairs for Underground and Aboveground

- A. General Requirements
 1. Noncombustible materials shall be used for stair construction.
 2. All treads, landings, and nosings shall have slip-resistant surfaces.
 3. At least one shallow sloping trough, 3-inches wide, shall be provided at the side of each surface to concourse stair to facilitate cleaning.

Treads of stairs exposed to the weather shall have a one-half (0.5) percent slope sideward toward the trough.

B. Standard Stair Widths (Minimum)

1. For Public Use: 5 feet 6 inches.
2. For Service Stairs (staff use only): 3 feet 8 inches.
3. Emergency Stairs: 3 feet 8 inches.
4. Emergency stairs adjacent to Area of Rescue: 4 feet 7 inches minimum (48 inches between handrails).

C. Stair Landings

1. For straight run stair, minimum and recommended length of landing: 4 feet 0 inches.
2. For return stair, minimum width of landing must be at least equal to width of stair.
3. Concealed reverse landings will be avoided in public stairs.

D. Treads and Risers

1. Public stairs running parallel to and adjoining escalators shall have a tread and riser relationship with a component of 30 degrees.
2. All other public stairs shall have a tread and riser relationship with a component within the comfort range of from 30 degrees to 35 degrees.
3. The maximum height of riser at public stairs shall be 7-inches. Minimum tread shall be 11 inches.
4. Number of risers in any one run of public stairs shall not exceed 22.
5. Solid treads and risers shall be used.
6. Tread and riser dimensions shall be uniform in any one stair.
7. Minimum allowable number of risers: three. Where a change in elevation is less than 18 inches, a ramp shall be used.
8. Minimum headroom at public stairs measured vertically from the line of nosings: 8 feet 6 inches. Continuous soffits, without obstructions, should be held to 10 feet 0 inches.
9. Emergency stairs shall have a maximum 7 inch riser and a minimum 11 inch tread. The number of risers in any one run of stairs shall not exceed 20. The minimum clear headroom shall be not less than 6 feet 8 inches measured perpendicular to the tread at nosing.
10. Tread riser formula: The ratio of risers to treads shall fall within the following limits: $2R + T = 24$ to 25 .
11. The upper approach and all treads of exterior stairs is marked with a strip of clearly contrasting color a minimum of 2" in width a maximum of 1" from the tread nose or landing. The upper approach and lower tread of interior stairs shall have contrasting color striping a minimum of 2" in width and a maximum of 1" from the tread nose or landing. All contrasting color strips are at least as slip resistant as the other treads of the stair."

E. Handrails

1. Height of railing: shall be uniform, not less than 2 feet 10 inches and not more than 3 feet 2 inches measured vertically from the top of the tread, at the nosing, to the top of the handrail. (2 feet 10 inches at landings and 3 feet 8 inches around well openings or concourse edge.)
2. Handrails may extend a maximum of 3-1/2 inches into required stair width.
3. Handrails, except center handrails, shall be continuous through landings for the full length of the stair.
4. Handrails should extend a minimum of 12 inches beyond the top riser and 12 inches + 1 tread width beyond the bottom riser.
5. Continuous handrails must be provided on both sides of all stairs.
6. Maximum allowable stair width without a center handrail: 7 feet 4 inches. Center handrails should be provided on narrower stairs where needed or required to aid circulation. All stairs (except monumental stairs) in excess of 7 feet 4 inches wide must have center handrails spaced no more than 7 feet 4 inches apart.
7. Where a balustrade is not solid, the distance between vertical balusters must not exceed 4 inches.
8. Handrail ends shall be returned to wall, or curved down 90 degrees where free-standing.
9. Handrail material in public areas shall be #4 brushed finish stainless steel.
10. At public stairs avoid horizontal design of intermediate rails, to avoid ladder type effect, to discourage children to climb rail.
11. Center handrails at public entrance stairs in underground stations shall have illuminated linear LED light, shall have air space between rail and light fixture, and shall comply with ADA requirements.

6.14.5 Pedestrian Ramps

- A. Slope of Ramp: not to exceed 1 foot 0 inches in 20 feet 0 inches (5%) preferred; not to exceed 1 foot 0 inches in 12 feet 0 inches (8.33%) maximum.
- B. For ramps with a slope greater than 5%, landings are required for each 2'6" rise in elevation.
- C. General requirements for ramp widths, landings, and handrails are as noted for stairs. See provisions for individuals with Disabilities section of these criteria for ramp requirements.
- D. Surface of ramps shall be slip-resistant. Coefficient of friction shall be 0.8 per ADAAG.
- E. Cleaning trough not required for ramps.

6.14.6 Escalators

- A. General Requirements
 1. Escalators may be furnished and installed under a separate systemwide contract.
 2. Direction - dual direction.

3. Width - All escalators shall be 48 inches nominal width.
4. Speed and Capacity

The speed of escalators shall be 90 feet per minute (fpm) in both "up" and "down" directions. They shall be capable of operating 24 hours nonstop.
5. Rise and Slope

Rise (H) is the true vertical distance between working points (W.P.). All escalators shall be installed with the line of stop nosings 30 degrees from the true horizontal.
6. Structural Considerations

A slip connection at the head of escalators in above ground stations, and at the foot of escalators in below ground stations, will be provided by the escalator manufacturer to allow for movement (deflection, torsion, etc.) due to the load on the station structure caused by the train as it moves in and out of the station. Escalator truss work and other structural members are not to receive loads other than those imposed by the escalator itself.
7. Floor Slope

Landing plates must be level. Adjacent floors shall be sloped away from the escalator. The texture of the floor in proximity to the landings shall contrast with the finish of the surrounding area for detection by the visually impaired.
8. Space and Safety Requirements for Escalator Machine Space
 - a. Within the machine space there will be no obstruction, such as supporting posts for the upper support beam, partitions, etc. This area will be reserved for the installation of motors, drivers, and controllers of various sizes and placements.
 - b. Machine space shall be provided with natural or mechanical ventilation to avoid overheating of electrical equipment and to ensure safe and normal operation of the escalator.
 - c. Any floor-mounted equipment other than escalators and their drive machines will be placed on reinforced concrete housekeeping pads. Minimum pad height shall be 4 inches.
 - d. All machine pits shall be provided with removable covers over the full area of the machine pit. Covers shall be removable by one man without use of special equipment.
 - e. Escalator finish materials shall be #4 brushed finish stainless steel. Moving handrail is to be black rubber. (See Architectural Standard Drawings for further information.)
9. Safety Requirements for Escalators Treads
 - a. At the top and bottom of each escalator run, at least three contiguous treads shall be level beyond the comb plate before the risers begin to form.
 - b. All escalator treads shall be marked by a strip of clearly contrasting color, 2 inches in width, placed parallel to and on the nose of each step. The strip shall be of a material that is at least

as slip resistant as the remainder of the tread. The edge of tread shall be apparent from both ascending and descending directions.

c. Noise Attenuation Requirements

Noise produced by escalators operating individually in either direction under no load and under maximum load in the station environment shall not exceed 55 dBA 5 feet above the tread at the entrance combs at both ends of the escalator.

10. General Requirements

- a. Stop controls on site (inaccessible to public) and at the ROC.
- b. Public-accessible emergency stop buttons at top and bottom of escalator. When activated, the emergency stop button should cause an alarm at the ROC.
- c. All escalator steps must be visible from the switch when stopping or starting escalators.
- d. Stairs must accompany escalators (side by side).
- e. Provide weather protection for outdoor escalators – comply with the requirements of ASME 17.1 Section 807.
- f. Escalators shall be heavy duty transit escalators, and the design shall fully incorporate APTA Heavy Duty Transportation System Escalator Design Guidelines.
- g. Keys for restarting escalators shall match existing Metro escalator keys.
- h. Provide connections to Metro's SCADA system for remote monitoring and/or control.

6.14.7 Elevators

A. Planning Requirements

1. Elevators shall be installed in all stations, Metro facilities, and parking structures where there are differences in level. Depending on the configuration of the station, Metro facilities, and parking structures, the minimum number of two elevators shall be used to serve the separated areas and levels.
2. Travel between elevators at their overlap (concourse) level will require passing from the paid area to the free area or vice versa through the accessible gate. Elevators should be located to keep the travel distance through the accessible gate to a minimum.
3. The elevators at street level should be located so that it is near a loading zone. In stations with parking facilities, parking for persons with disabilities shall be located near the elevators.
4. Elevators used by disabled in stations and parking structures shall be glazed or have transparent glass door panels at the front and transparent glazed panels at the rear wall of the elevator cabs and shafts to allow an unobstructed view both into and out of the car.
5. Interior Elevator Finishes shall be vandal resistant. Elevator finish materials shall be #4 brushed finished stainless steel on all glazed wall surfaces, doors, frames, sills, and trim. Interior stainless steel shall be textured finish Regidized 5. WL or 6. WL or equivalent. Floor

and ceiling materials are to be as directed by Metro. Transparent surfaces shall be laminated glass. (See Architectural Standard and Directive Drawings for further information.)

6. Elevator Enclosures:
 - a. Walls of the enclosure must be transparent. The hoistway doors will be safety glazed and are of standard design.
 - b. Concourse to platform - safety glazed in a metal framed system with safety glazed hoistway doors. Enclosure and hoistway doors are of Standard design.
 - c. Street level platform - safety glazed with safety glazed hoistway doors at the front and safety glazed panel at the rear wall. Hoistway doors are of standard design.
 - d. Outdoor elevators – provide weather protection for elevator door and entrance area. All outdoor elevator structures shall be weather proof and shall not allow access to hoistway by pigeons or other vermin.
7. Elevator Cabs (All Standard Design):
 - a. Type A - stainless steel opaque walls with safety glazed doors at the front and safety glazed panels at the rear wall.
 - b. Type B - safety glazed in a metal framed system with safety glazed doors. Front panels alongside doors shall be stainless steel opaque walls.
 - c. All concourse to platform elevator cars shall be Type B.
 - d. Visibility into cab at all points of travel to enhance security. Elevators in stations are to be located so as to make the requirement for visibility of cab effective on all four sides.
 - e. An accessible intercom device connected to security center at the ROC. (See Communications Section for additional information).
 - f. Door size shall be: 3'-6" center double door complying with Los Angeles City Building Code, Los Angeles County Building Code or California Building Code.
 - g. Speed 150 fpm.
 - h. Elevator floors shall be stainless steel diamond plate in the form of a pan with welded seams to prevent intrusion of liquids below the floor surface.
 - i. Elevator control panels and pushbuttons shall be vandal resistant.
 - j. Required fire safety signage and other lettering shall be engraved into the control operating panel instead of a plastic mounted sign.
 - k. Elevator doors shall be constructed with stainless steel cores as well as skins to prevent corrosion from the inside out.
 - l. Elevator stop switches shall be keyed switches. No push/pull button type stop switches are to be installed in transit elevators.
 - m. Fireman's service key shall match existing Metro elevators.
 - n. Provide connections to Metro SCADA system for remote monitoring and/or control.

- o. Key for elevator stop switches shall match existing Metro elevators.
- 8. Elevators shall be heavy duty transit elevators. The elevator design shall fully incorporate APTA Heavy Duty Transportation System Elevator Design Guidelines.

6.15 INTERCHANGE STATIONS

6.15.1 Introduction

The following information identifies functional criteria for Interchange Stations. An Interchange Station is defined as a Metro Rail Station that connects two rail transit lines. These operational requirements apply to all new interchange stations. Functional criteria primarily focus on trackway configuration, maintenance facilities and support requirements. Design criteria relating to station passenger circulation, security, Fire/Life Safety, facilities for elderly and disabled patrons, and bus and auto access are contained elsewhere in the Metro Rail System Design Criteria and Standards.

6.15.2 Basic Goal

To ensure that Interchange Station designs provide the following:

- A. Adequate passenger-carrying capacity.
- B. Convenient and timely passenger transfers between rail lines.
- C. Required train movements through provision of pocket tracks and crossovers.

6.15.3 Functional Criteria

Functional criteria apply primarily to trackway configuration and its impact on train operations. These criteria are categorized according to the type of train operation at the Metro Rail station as follows: those applicable to a terminal station (T), to a midline station with a turnback function (MT), and to a midline station with through operation (M).

A. Operations

- 1. Designers shall incorporate features to provide for use of across-platform transfers whenever possible, and particularly where required by the Operating Plan due to large rail to rail transfer volumes. (T, MT, M)
- 2. Station design shall be adequate to handle the train movements required by the Operating Plan in and through the station. The following shall be considered:
 - a. The number of trains which must be in the station at one time and the time required to clear routes in and out of the stations. At design minimum headways, track configuration shall allow for the reversing of trains without occupying the station platforms. (T, MT)
 - b. Crossover capability requirements between tracks in both directions and at both ends of the station platform(s). (T, MT)
 - c. Turnback requirements. (T, MT)
 - d. Gap train storage requirements. (T, MT)

- e. Midday storage requirements. (T)
 - f. Overnight storage requirements. (T)
 - g. Requirements for storage of maximum length failed trains. (T, MT)
2. Station design shall provide the ability to construct future extensions while minimizing the impact to normal operations. (T, MT, M)
- B. Maintenance
1. When a non-revenue track connection between lines is specified as a requirement, the Designer shall provide a track design to move equipment of one line across another to reach maintenance or operating facilities. The track's clearances and traction power shall accommodate vehicles from both lines, thus providing an overlap zone to couple dissimilar cars for towing or to permit change over from one type of current collection to another. (T, MT, M)
 2. Station design shall provide personnel access to stored cars for car cleaning and maintenance. (T)
 3. Facility design shall provide space for storing supplies and equipment and shall have appropriate utilities. (T, MT)
- C. Support Requirements
1. Station design shall provide appropriate facilities for bus operating personnel in accordance with Operating Plan requirements if the rail interchange is a major bus stop/layover point. (T, MT, M)
 2. Station design shall provide washrooms and supervisor's booth for rail personnel in accordance with Operating Plan requirements. (T, MT)

6.16 PROVISIONS FOR INDIVIDUALS WITH DISABILITIES

6.16.1 Introduction

The following design requirements render the Metro Rail System accessible, and usable by, the elderly and individuals with disabilities. The system shall contain specific design provisions for the reduction or elimination of barriers that impede the use of the system by persons with disabilities. The policy to be implemented is to accommodate all persons who, without intervention or assistance by others, can arrive at and enter the system, and to facilitate use by individuals with disabilities.

According to the rules and regulations of the Americans with Disabilities Act (ADA), all Metro Rail System facilities used by the general public constructed after November 26, 2006 must comply with all the applicable requirements for New Construction. Only the minimum requirements for design and construction are incorporated into the ADA Accessibility Guidelines. Related regulatory provisions of other government agencies having jurisdiction shall be used for additional guidelines in designing and constructing the Metro Rail System to be free of architectural or transportation barriers including California Title 24 (CCR).

6.16.2 Codes and Standards

The following codes and standards are the basis for these criteria:

- California Government Code Sections 4450-4458, "Access to Public Buildings by Physically Disabled Persons."
- California Government Code Section 4500, "Rapid Transit."

- California Government Code Sections 7250-7252, "Facilities for Disabled Persons."
- California Health and Safety Code Sections 19955-19959, "Access to Public Accommodations by Physically Disabled Persons."
- California Civil Code Sections 54-55.1, "Blind and Other Physically Disabled Persons."
- California Access Laws, Department of Rehabilitation.
- General Order 143A, Public Utilities Commission of the State of California, "Rules for the Design, Construction and Operation of Light Rail Transit Systems including Streetcar Operations."
- ADAAG - ADA and ABA Accessibility Guidelines for Buildings and Facilities adopted by the FTA November 29, 2006.

Unless specifically noted otherwise herein, the latest edition of the code, regulation and standard shall be used.

It is the responsibility of the Designer to ensure that all code requirements are met, whether or not they are cited here.

6.16.3 Systemwide Criteria

A. Signage and Graphics

Signage shall conform to the standards specified in ADAAG Section 703, Signs. The International Symbol of Accessibility shall be displayed according to ADAAG. Signage is required to identify accessible facilities and elements.

Raised and braille characters, complying with ADAAG Section 703, Signs, shall be provided at signs identifying station names, signs bearing instructions and all information for use of emergency phones, automatic fare vending, collection and adjustment equipment, and where required by ADAAG. For elevator graphics, see Standard and Directive Drawings and Signing and Graphic Section of Criteria.

B. Emergency Warning Systems

Emergency warning systems shall include both audible and visible alarms, in accordance with ADAAG Section 703, and Title 24, CA Code of Regulations "Requirement for the Accommodation of the Disabled in Public Accommodations".

C. Controls

All equipment required to be accessible shall be positioned and mounted in such a way that wheelchair users can use the controls as required by ADAAG Section 308, Reach Range, and Title 24, Section 3105. Anthropometric standards are addressed in ADAAG. This requirement applies to, but is not limited to, the following equipment: ~~public telephones,~~ emergency and system information telephones, and fare vending, collection and adjustment equipment at stations/stops.

Installation height of manual fire alarm initiating devices shall be as specified in ADAAG Section 308, Reach Range, and Title 24, Section 3105.

In facilities where system employees have access (e.g., non-public portions of stations, the Yards and Shops, and the ROC), accessibility of controls and operating mechanism shall be as defined in ADAAG Section 308, Reach Range.

D. Hazards

Hazards due to abrupt changes in floor level, ground and floor surfaces, and gratings shall be mitigated in accordance with ADAAG Chapter 4: Accessible Routes, and Title 24, Section 3105.

Objects protruding from walls or ceilings shall be located so as to provide the dimensional clearances cited in ADAAG Chapter 4: Accessible Routes, and Title 24, Section 3105.

E. Doors

Doors in stations required to be accessible to the public or system employees shall be as specified in ADAAG Section 404, Doors, Doorways, and Gates.

6.16.4 Stations

A. Access

All entrances to buildings and facilities shall be made accessible to individuals with disabilities, as specified in ADAAG Chapter 4: Accessible Routes, and Title 24, Section 3103(b)3.

Site development and grading shall be designed to provide access to entrances and normal paths of travel, as specified in ADAAG Chapter 4: Accessible Routes, and Title 24, Section 3106.1. Where necessary, pedestrian ramps, curb ramps, and/or elevators shall be incorporated in such paths.

Specific requirements for elements of vertical circulation (ramps, stairs, and elevators) are discussed in Vertical Circulation section of these Criteria.

Floors and levels within a station/stop shall conform to ADAAG Chapter 4: Accessible Routes. In or at multilevel stations/stops, direct access shall be provided for individuals with disabilities between levels, as specified in ADAAG Section 405, Ramps. Walks and sidewalks at the station/stop site shall conform with ADAAG Section 403, Walking Surfaces, and Title 24, Section 3326.

Tactile Guidance provides a pathway for visually impaired patrons that starts at each rail station entrance and leads to the directional bars on the station platform that identify safe waiting areas. The pathway has side branches that lead to fare machines and at least one emergency intercom. The pathway leads to both stairways and elevator call buttons but not escalators.

The installation of the tactile guidance in conjunction with the installation of the tactile directional bars on the station platforms will direct persons with visual impairments from the property line to the location on the platform where they can safely wait and board a Metro vehicle.

For the requirements of the tactile guidance and directional bars refer to Metro Rail Architectural Standard and Directive Drawings.

B. Platform

The platform edge strip shall conform to ADAAG, Section 810.5.2 and Title 24, Section 3326 and be at least 24 inches wide, and shall run the full length of the platform and meet the Sound on Cane Contact requirements. Per Title 24, Section 3326(d) pedestrian access aligning with vehicle doors where passengers will embark may require detectable directional texture.

All light rail platforms shall be 39 inches and heavy rail platforms shall be 44 inches above top of rail, within the same vertical alignment plane as the vehicle floor, within plus or minus 5/8 inch. For further restrictions on the horizontal and vertical gap between the platform and the vehicle, refer to System Safety, section and ADAAG.

In all assembly places where seating is provided, there shall be spaces provided for wheelchair users. Accessible seating shall be provided in accordance with Title 24, Section 3103(a). In addition to the spaces provided for wheelchair users, seating suitable for individuals with ambulatory impairments shall be provided, in accordance with Title 24, Section 3103(a).

C. Communications

~~Public telephones shall be in accordance with ADAAG Section 704, Telephones.~~

In addition, normal and emergency communications equipment usable by the public shall conform to Section 708, Two-way Communication System.

Text telephones shall be provided in accordance with ADAAG, Section 217, Telephones.

A means of conveying equivalent information announced through the PA shall be provided for persons with hearing loss or who are deaf.

D. Track Crossings

Where it is necessary to cross tracks to reach or exit boarding platforms, provisions are to be made as required by ADAAG section 810.10 and in compliance with ADAAG, Section 404, Doors, Doorways, and Gates.

6.16.5 Elements of Vertical Circulation

Ramps, stairs, and elevators shall be used to provide access to all station/stop facilities and between levels of multistory stations/stops. They shall also be provided in the O&M buildings and other facilities to which only system employees have access as necessary, given the job requirements. Any O&M facilities open to the public shall comply with the ADAAG and California Title 24 CCR requirements.

A. Ramps

A path of travel with a slope greater than 1:20 (5%) shall be considered a ramp. Ramps shall meet the requirements of ADAAG Section 405.

Ramps, if needed, shall be provided at each at-grade station, not in subway or aerial structures.

Pedestrian ramps shall have a minimum of 48 inches in clear width, except that pedestrian ramps serving primary entrances to buildings having an occupant load of 300 or more shall have a minimum clear width of 60 inches. The maximum slope shall be 1 foot rise in 12 feet of horizontal run with a cross slope no greater than 1:50, although more gradual slopes are desirable. Ramp landings shall be provided at the top and bottom of each ramp at intervals not exceeding 30 inches of vertical rise, and at each change of direction. Other constraints are given in Title 24, Section 3307 and ADAAG. Warning strips (truncated domes) shall be installed for ramps or hazard zone as required below.

Handrails shall be provided on each side of any ramp whose slope exceeds 1:20 or whose rise is greater than 6 inches. The handrails shall be continuous, placed 34 to 38 inches above the ramp surface, and shall extend at least 12 inches beyond the top and bottom of the ramp, with returned ends. Refer to ADAAG and Title 24, Section 3307(e.1).

The surface of ramps shall be slip-resistant, and wheel guides or curbs shall be provided on ramps longer than 10 feet. See ADAAG, Sections 4.5 and A4.5.1, Ground and Floor Surfaces and Title 24, Section 3307 for wheel guide requirements.

B. Stairs

Stairs shall comply with the ADAAG Section 504, Stairways. The upper approach and the lower tread of each stair shall be marked by a strip of clearly contrasting color at least 2 inches wide, placed parallel to and not more than 1 inch from the nose of the step or landing. The strip shall be of material that is slip-resistant. Where stairways occur outside a building, the upper approach and all treads shall be marked by the strips described above; a painted strip shall be acceptable Title 24, Section 3306(r).

Open risers are not permitted according to ADAAG Section 504, Stairways and Title 24, Section 3306(s)3. Treads shall not have abrupt edges at the nosing, and shall not project more than 1-1/2 inch past the face of the riser ADAAG, Section 504, Stairways.

C. Elevators

Minimum of two elevators shall be provided at aboveground and underground stations and in all accessible buildings having more than one floor level, including parking structures. They shall conform to the requirements in Section 408, Elevators of the ADAAG and the ANSI/ASME A17.1 and Title 24, Section 3105(c) and Chapter 51.

The minimum inside clear dimensions of the car shall be 82 inches by 64 inches, for center opening doors. The clear opening width of the door shall be 42 inches (ADAAG, Section 407.4.1). The elevator shall have an automatic leveling feature with a tolerance of $\pm \frac{1}{2}$ inch (with respect to the adjacent floor landing), which shall be maintained under normal loading and zero loading conditions (ADAAG, Section).

Passenger elevators shall be provided with at least one handrail at a nominal height of 32 inches above the car platform, preferably on the rear wall (Title 24, Section 5103).

Elevator floor buttons shall be no higher than 48 inches from the car floor. Emergency controls shall be grouped at the bottom of the elevator control panel and shall be no lower than 35 inches to center line from the car floor. The emergency telephone handset shall be positioned no higher than 48 inches above the floor, and the cord shall be at least 29 inches long. Hall call buttons shall be within 42 inches of the floor. Other factors that shall comply with ADA Section 407, Elevators and Title 24 are minimum button dimensions, tactile, braille and other identification for the visually impaired, visual and audible car call signals, non-voice emergency communication, hall lantern location and dimensions, and floor designations at each hoistway entrance.

Station elevator communication and control systems shall be designed to allow either unconstrained access by passengers or access controlled by system operating personnel (either remotely or locally), so as to allow the future system operator to establish its own operating procedures.

D. Pedestrian Grade Separations

Pedestrian grade separations shall be designed as specified in Title 24, Sections 3106.1 through 3108.1.

6.16.6 Not Used

6.16.7 Fare Collection

The baseline fare collection concept for the Metro Rail System is self-service. Fare gates/barriers will be installed in the stations and, therefore, there will be physical separation between a "free" area and a "paid" area of a station/stop. Ticket vending machines (TVMs) and standalone validators (SAVs) will be provided at each station.

The control and operating mechanism of all TVMs and SAVs shall be no higher than 48 inches above the finished floor in compliance with ADAAG Section 308, Reach Ranges. Clear floor space and maneuvering clearance requirements shall comply with ADAAG Section 403, Walking Surfaces.

At stations/stops providing direct physical interchange with other transit modes, means shall be provided for wheelchair occupants to make the transfer independently, i.e., with no more assistance required from the operating staff than is required by other passengers. If a future line or other transit mode system implements a fare gate system concept, a door or gate accessible to individuals with disabilities shall be provided within 30 feet from the bank of Metro Rail turnstile/gate entrances, in accordance with ADAAG Section 404, Doors, Doorways, and Gates.

Also, should an agent's booth be provided at intermodal transfer facilities for purposes of vending transfer media, both customer and employee side of the booth shall be made accessible to individuals with disabilities, in accordance with ADAAG.

6.16.8 Emergency Egress Provisions

The design of Metro Rail System Facilities shall include provisions to enable the safe, timely, and unsupervised evacuation of passengers and employees from all fixed structures and facilities. As a policy, vehicle evacuation is to be accomplished only under the direct supervision of trained emergency forces or system employees. (See Metro Fire/Life Safety Criteria.) In particular, the design shall include provisions and procedures for supervising the safe, timely, and orderly evacuation of passengers with disabilities from vehicles located anywhere in the system.

6.16.9 Operations and Maintenance (O&M) Facilities

The O&M facilities include the ROC, the Yard and Shop Facilities, and portions of stations/stops open to system employees but not to the public. During the design phases of Metro Rail Facilities employee job descriptions shall be analyzed to determine those disabilities that would, by their nature, preclude a disabled person from performing a job satisfactorily. The design of the O&M facilities and system equipment shall accommodate, as necessary, those disabilities that are not precluded; the design shall be in accordance with Title 24 (CCR). In particular, Title 24 requirements for Group B occupancies shall apply, Group B occupancies being defined as "... those that are used by the public as customers, clients, visitors, or which are potentially places of employment..." [California Title 24, Section 3103 (a) 3.B.1]

Employee work areas shall be designed and constructed so that individuals with disabilities can approach, enter and exit the areas as required by ADAAG, and Title 24, Section 3105(m).

In addition to the other requirements cited herein, Title 24, Section 3105 and Section 1506 of the State Plumbing Code shall apply to plumbing in the O&M facilities.

ATTACHMENT C

TASK LIST ELEVATORS

Regular routine maintenance inspections shall be performed at a frequency of not less than weekly. The mechanic performing these inspections shall: observe the operation of the equipment through its full range of movement, and make corrections, adjustments, lubrications, etc., required to maintain the equipment in safe and complete operation. At a minimum, the following checks shall be made.

TASKS OBSERVE, CLEAN, LUBRICATE, ADJUST AS NECESSARY	Month	Month	Month	Month	Month	Month
WEEKLY						
Car operation, including door timing & selector control mechanism.						
Control and relay panel.						
Hydraulic power unit.						
Pit, plunger, packing, tank, and piping (Hydraulic Elevators).						
Clean door tracks and sills.						
Check and replace burnt out signal and indication lights.						
MONTHLY						
Observe, clean, lubricate, and adjust door operation.						
Check operation of chuck keys, set screws, linkage, cams, etc.						
Check and lubricate, as necessary, selector brushes, contacts, traveling cables, chain, and magnets.						
Observe operation of signal systems. Repair as necessary.						
Inspect pumping unit, valves, motors and Check oil level in tank (Hydraulic Elevators).						
QUARTERLY						
Check mainline fuses for heating.	Date Work Performed:			Date Work Performed:		
Check oil level of car cam devices. Inspect, clean, adjust retiring cam. device, chain dashpots. Commutator - test emergency switch (ground case if necessary). Inspect safety parts, pivots, set screws, switches, etc.	Date Work Performed:			Date Work Performed:		
Clean, adjust, lubricate leveling switches and leveling operations, hoistway vanes, magnets, inductors.	Date Work Performed:			Date Work Performed:		

ATTACHMENT C (continued)

QUARTERLY CONTINUED		
Clean, lubricate, adjust tracks, hangers, and up-thrust on hoistway door.	Date Work Performed:	Date Work Performed:
Repair and adjust electronic door operation system (as applicable). Clean as necessary.	Date Work Performed:	Date Work Performed:
Clean, lubricate, adjust overload mechanism (as applicable).	Date Work Performed:	Date Work Performed:
Clean, adjust, lubricate car top exit.	Date Work Performed:	Date Work Performed:
SEMI-ANNUALLY		
On door closer, check inertia of doors and make adjustments as necessary. Observe operation of checks, interlocks, etc. Adjust or replace as necessary.	Date Work Performed:	
On car operating box, check, clean, adjust contacts & switches.	Date Work Performed:	
On elevator controllers, check all condensers, resistance tubes, grids, fuses, holders, contacts, and all controller connections. Check alignment of switches.	Date Work Performed:	
Check and clean car tops, check hoistway.	Date Work Performed:	
Clean car tops, check hoistway.	Date Work Performed:	
Hoist Ropes--adjust, clean, lube as necessary (Traction Elevators).	Date Work Performed:	
Check car frame, cam. supports, and car steadying plates. Check pivot points, sheaves guides and track for wear. Lubricate as required.	Date Work Performed:	
Seal small leaks in pump unit and check coupling, hoses, and suction screens (Hydraulic Elevators).	Date Work Performed:	
Doors: Clean chains, tracks, sheaves, and door contacts. Lubricate as required. Check shaft bearings, tapered pins, alignment, and operation of cams and rollers.	Date Work Performed:	

ATTACHMENT C (continued)

ANNUALLY	
Check adjustments of car shoes or roller guides, adjust & lube (as applicable) if necessary, including guide shoe stems. Check car clearance and safety shoes and adjust as necessary.	Date Work Performed:
Inspect car stile channels, frame and cam. supports for bends or cracks. Clean car grille and stile channels.	Date Work Performed:
Inspect car gate up-thrust, sill grooves, and bottom guides, clean, maintain, replace as necessary.	Date Work Performed:
Inspect traveling cable insulation, performance, hangers, and junction box connections.	Date Work Performed:
Inspect and test limit and terminal switches for proper operation.	Date Work Performed:
Inspect hall button contacts, springs, and wiring. Clean and lube.	Date Work Performed:
Hoistway Doors: Fill and adjust checks and door, eccentrics. Check bottom guides, struts, sills, headers, bumpers, and fastening. Adjust door contacts as required; clean, lube, and adjust chains and sheaves.	Date Work Performed:
Controller: Check settings and check operations of both manual and automatic overloads, check alignment of switches, relay timers, hinge pins, adjust and lube as required.	Date Work Performed:
Keep exterior machinery clean, painted, and presentable. Check elevator shaft for settling cracks in structure and report findings to METRO.	Date Work Performed:
Clean interior hoistway glass panels.	Date Work Performed:
Test all safety devices. Perform required weight & safety test required by code.	Date Work Performed:
Check car enclosure steadying plates.	Date Work Performed:
Inspect, clean, and adjust guide rails, cams.	Date Work Performed:

ATTACHMENT D (continued)

MONTHLY						
Run escalator in reverse direction for at least ten (10) minute interval. Make adjustments as necessary.						
Observe, clean, lubricate, and adjust, as necessary, handrail chains, main drive chain, sprockets, reversal device, step chains, step wheels, bushings, pins, chain tension & switches. Clean upper & lower pans.						
Clean hand rails, interiors, and wax (if necessary).						
Lubricate or spray side skirt panels adjacent to steps with silicon spray to prevent rubbers, boots, rubber soled shoes from dragging and grabbing steps, etc. Be cautious to prevent over-spraying onto step area.						
Check gearbox oil level - gears.						
Check step demarcation lighting.						
Check balustrade lighting and combplate lighting.						
Perform brake torque test.						
QUARTERLY						
Handrail appearance, brush guards, moldings, & clearances.	Date Work Performed:			Date Work Performed:		
Check step clearances, up-thrust, alignment, and switches, adjust per code.	Date Work Performed:			Date Work Performed:		
Check mainline switch fuses for heating.	Date Work Performed:			Date Work Performed:		
Remove handrail at curves and check handrail. Vacuum out & clean handrail turn around.	Date Work Performed:			Date Work Performed:		
Check tracks for alignment, check that joints are flush.	Date Work Performed:			Date Work Performed:		
Check spring & alignment - guides/newels/tension device and handrail drive chain.	Date Work Performed:			Date Work Performed:		
Check rubber tires for wear.	Date Work Performed:			Date Work Performed:		
Repair/replace parts as needed.	Date Work Performed:			Date Work Performed:		
Examine drive chain or gears, brake shoes, brake cores. Lube brake cores. Replace brake lining if necessary.	Date Work Performed:			Date Work Performed:		
Seal all leaks from any leaking component.	Date Work Performed:			Date Work Performed:		

ATTACHMENT D (continued)

SEMI-ANNUALLY	
Intermediate gear-gearing, motor bearing, worm shaft bearing, governor, and sheave bearings/seal small leaks.	Date Work Performed:
Brake pins & bushings, clearance, contacts & switches.	Date Work Performed:
Motor armature/rotor clearance, motor connections, & bearings.	Date Work Performed:
Start/stop button contacts, springs, wiring, key switches, covers.	Date Work Performed:
Controller voltage, fuses, overload relays, condensers, air gaps, alignment of switches. Clean entire controller.	Date Work Performed:
Check and lube governor.	Date Work Performed:
Inspect all bearings, replace as needed.	Date Work Performed:
Pry lower carriage/lower sprocket to check for excessive play.	Date Work Performed:
Examine all steps and replace bearings and wheels as needed.	Date Work Performed:
Examine & check operation of emergency brake.	Date Work Performed:
Lubricate all chains.	Date Work Performed:
Check/adjust step chain tension carriage & install steps, adjust skirts for proper step clearance, check micro switches if used.	Date Work Performed:
Overhaul friction-reversing device.	Date Work Performed:
Adjust lower carriage switch.	Date Work Performed:
ANNUALLY	NOTE: Start schedule for escalator annual to be set by the Maintenance Supervisor.
CONTROL PANEL	
Check & clean inside control panel (Mainline power off).	Date Work Performed:
Exercise N.F. breaker/circuit (Mainline power off).	Date Work Performed:
Remove, clean, and re-insert fuse (Mainline power off).	Date Work Performed:
Manually activate main relays (Mainline power off).	Date Work Performed:
Tighten wire terminals (Mainline power off).	Date Work Performed:

ATTACHMENT D (continued)

ANNUALLY CONTINUED	NOTE: Start schedule for escalator annual to be set by the Maintenance Supervisor.
STEPS	
Check and clean step steps.	Date Work Performed:
Check the gap between the step and the skirt guards.	Date Work Performed:
STEP AXLES, STEP MAIN ROLLERS & STEP CHAIN	
Check and clean step axles & step main rollers.	Date Work Performed:
Check side rollers.	Date Work Performed:
Check step chains.	Date Work Performed:
Check automatic oiler pipe placement.	Date Work Performed:
STEP DRIVE UNIT	
Examine top and bottom sprockets.	Date Work Performed:
Step chain tension device.	Date Work Performed:
TRACK	
Check and clean tracks.	Date Work Performed:
Clean oil and debris off the drip pan.	Date Work Performed:
Check step chain guides.	Date Work Performed:
SAFETY DEVICES	
Test handrail inlet switches.	Date Work Performed:
Test skirt switches.	Date Work Performed:
Test step chain switches.	Date Work Performed:
Test upthrust switches.	Date Work Performed:
Test comb plate horizontal & upthrust switches.	Date Work Performed:
Test drive chain switches.	Date Work Performed:
Test curved rail switches.	Date Work Performed:
Test side roller switches.	Date Work Performed:
Test step roller switches.	Date Work Performed:

END OF SECTION