



RAPID TRANSIT SYSTEM EXTENSIONS
COMPENDIUM OF DESIGN CRITERIA

VOLUME II
STATION DESIGN CRITERIA

CHAPTER 1
ARCHITECTURAL DESIGN CRITERIA

INTERIM RELEASE

REV 1

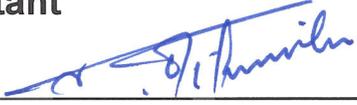
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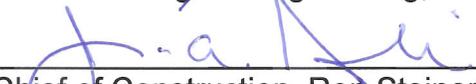
VOLUME II - STATION
CHAPTER 1 – ARCHITECTURAL DESIGN CRITERIA
REVISION 1

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REVISION 1

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1.01 INTRODUCTION

Miami -Dade County's diverse sociological makeup, climate, and sub-tropical plant life are unique to any city in this country. Its rapid transit system must therefore be constructed to take full advantage of the region's natural attributes and reflect the highest state-of-the-art in transit design and technology. The System must express itself in both structure and components as an aesthetically unified system conforming to a commonality of function, establishing a strong and timeless identity of its own and taking its place among the most significant and attractive systems in the world. In so doing, the System will, as an integral part of the region's daily life and visual environment, foster increased civic pride and become an additional attraction for those passing through or visiting the metropolitan area.

The outward visual perception of this System is extremely important in that it is this perception that initially attracts the transit patron to the System. The visual as well as functional clarity of the stations and station sites shall be insured with the incorporation of the Systemwide Elements and Systemwide Criteria. The elements and criteria shall determine certain levels of repetition for the System's functional elements and functional relationships. The unified functional patterns, coupled with a visual and spatial continuity between occurring station levels, as well as the station and its surroundings, aid not only the everyday patron but also the newcomers and the many physically challenged

Due to this commonality of function among stations, design concepts optimizing spatial and circulation relationships within prototypical station configurations have been developed. Experience gained from other transit systems has shown that substantial savings can be achieved by limiting the number of special conditions through standardized station configurations. By

utilizing this systemic approach, a large measure of control has been established over the visual and functional impact on the various stations.

Conceptually consistent designs fulfilling functional, as well as aesthetic requirements, have been adapted to the unique subtropical climate of South Florida. Landscaping shall be used extensively throughout the entire System to maintain visual continuity with the surrounding environment while enriching the System itself. Natural ventilation and openness within station areas shall be achieved by minimizing closure walls and providing only those coverings needed to secure the station and provide adequate shade and shelter for the patron's comfort.

The current adopted version of the codes, standards and regulations cited within this document shall apply, and unless otherwise directed, all addenda, interim supplements, revisions and ordinances by the respective code body shall also apply. Where conflicts exist between these, the more stringent requirement shall take precedence, unless otherwise directed by MDT.

NOTE: References in parenthesis remain to be cross referenced against criteria not yet updated.

1.02 URBAN DESIGN

1.02.1 INTRODUCTION

- A. The intent of this section is to give the Final Designers a broad overview of the Urban design implications of the Miami-Dade Rapid Transit System and will specifically address the visual impacts of the System, the design objectives for integration of the System into the urban fabric and will help define the opportunities and constraints for enhancing the established urban landscape.

- B. Since the System is such a large civic undertaking, and so highly visible, its design must significantly influence the establishment and growth of a beautiful urban landscape, one that is comfortable, identifiable, legible and meaningful.

1.02.2 LAND USE

- A. The sites selected for the location of transit facilities are based upon the operational demands of the system, local community constraints, and the availability of appropriate land. The facilities, including the guideway, stations and yard and shop site, were identified and selected in a manner consistent with local planning objectives and guidelines portrayed in comprehensive land use plans and zoning regulations.

- B. For purposes of continuity with past planning processes, the final design of transit facilities shall reflect the following objectives:
 - 1) Minimize neighborhood disruption by recognizing and reflecting to the fullest extent possible, existing and planned land use trends and community activity patterns.

- 2) Assist or complement the implementation of community goals and objectives presented in adopted or officially recognized public plans.
- 3) Reflect the input of the Station Area Stakeholders relevant to transit facilities design as it identifies specific land use considerations critical to each system.
- 4) Provide opportunities to accommodate on or offsite transit oriented development with the public or private sector where possible, based upon input from the station area stakeholders and MDT

1.02.3 RIGHT-OF-WAY

1.02.3.1 Image

- A. More often than not, high volume streets and expressways are designed and, therefore, rightly perceived, as a utilitarian means of getting from one place to another. Although perceived by those using them as a link from one area to the next, they are generally not thought of as a part of a neighborhood. To the people of a given neighborhood through which they pass, they are perceived as an intrusion or a barrier. At best, they mark the edge or boundary of a particular area. The image of the Miami-Dade Transit System must not be one of an intruder.
- B. An elevated transit system, provides patrons with a panorama of the urban area as it unfolds before them. With this overview, the major functional and social areas, principal centers of activity and points of interest linked by the system are more easily perceived.

1.02.3.2 Linear Park

- A. Since the majority of the System consists of an elevated guideway, the opportunity exists to utilize the space under and around the guideway to the benefit of neighborhoods and the metropolitan area in general.
- B. In selected areas, subject to guidelines for safety and security, the space under the guideway may be used for needed System parking or other limited uses that will benefit nearby commercial or residential areas.
- C. Where possible, the space under the guideway will be utilized as a linear park, to provide not only added recreational space and bicycle path, but a pleasant walk for transit patrons, neighborhood pedestrians and to visually enhance the transit corridors.
- D. The linear park, as well as the public spaces within the transit sites should strengthen existing and proposed parks, urban spaces and activity centers within walking distance of one another by providing an inviting pedestrian link between them.

1.02.4 STATION AREAS

- A. Depending on the structure of the surrounding area, transit stations may become nodes of activity, gateways to areas and neighborhoods or local landmarks.
- B. Regardless of the specific geographic relationship of the station to the surrounding area, the existence of a transit station will establish or reinforce nodes of development, through increased accessibility, be they commercial, residential, civic or mixed use.

- C. The degree to which the station will exert this influence depends upon the way in which it relates to the urban fabric and the quality of identity or "sense of place" that the station conveys to the public.
- D. There is ample indication of how users value a setting that they have not previously experienced. An area's visual appearance, scale and use of materials relate to the positive effect upon the user. If the users of a facility feel comfortable and secure, have a good sense of orientation and a feeling of well being, if not exhilaration, then their regard for the facility will be one of respect and even pride.
- E. Where station structures and guideway are significantly different in scale than that of surrounding development, their visual impact will be reduced by keeping the structures as simple and clean an architectural and structural statement as possible and by making scale transitions with landscaping.
- F. The architectural styles of the neighborhoods surrounding the stations are usually unsuitable for the architectural structures of a rail transit system. Therefore, of more importance than copying architectural style, is reflecting the existing movement patterns in a given area around the station and respecting established walkways, existing and proposed open spaces, and designing the new facilities to compliment them.
- G. Respect for the existing neighborhood should be demonstrated in the form of lighting that does not intrude into surrounding areas, proper screening of visual elements necessarily out of scale with the surroundings due to their function, noise attenuation, preservation of desirable views and vistas to and from the station sites, and the general

creation of an inviting element in a neighborhood that will support civic pride.

- H. Station site locations have been established with the involvement of local residents, business people and government entities. Among the many factors considered in site selection were adherence to the Miami-Dade County Comprehensive Development Master Plan and the plans for the host Municipality. Therefore, the station locations generally conform to these plans and present opportunities to strengthen them. Methods utilized to strengthen the plans may be "active"; such as transit oriented development, but need not be. The presence of a transit station and the increased accessibility it will provide to an area, reinforced by clear and inviting access, will be a significant step toward promoting desired growth, change and/or rehabilitation of that area.

1.02.5 PEDESTRIAN WAYS

1.02.5.1 Introduction

- A. The geometrical configuration and design for pedestrians shall be based on the trip purpose, rate of movement, volume and type of supporting facilities provided, such as seating, lighting, etc. Also incorporated into the design shall be the proper interface with other movement systems, such as auto and bicycle paths.

- B. The location and alignment of major pedestrian paths shall attempt to create a visual experience and direct functional linkage between significant activity nodes and shall conform to the configuration of major natural and architectural forms which convey an identity to an area as well as enhance environmental quality. The less significant areas shall also be accessible via a convenient sidewalk or bike path.

1.02.5.2 Grade Changes and Inclines

- A. Sidewalks shall be designed in accordance prevailing ADA standards.
- B. If steps are provided, a ramp shall also be included to accommodate the physically challenged. In either case, positive drainage away from the traveled way shall be provided.

1.02.5.3 Surface

- A. The form and texture of a surface material can have an impact on directional movement, define the character and boundaries of a space, and provide visual clarity. In directing the movement of pedestrians, physical barriers, signs or definite changes in texture may be used.
- B. Landscaping and graphics are encouraged to augment paving patterns and colors in directing pedestrian movement.

1.02.5.4 Geometry

- A. The direction of movement along a walkway shall be planned and controlled. A well planned walkway will provide experiences that are much more enjoyable than if people are left to move at random.
- B. In the design of a pedestrian system, the following criteria shall be considered:
 - 1) Pedestrians tend to take the shortest distance between two points, given the opportunity. Therefore, if it is desirable to detour pedestrians from the most direct route a well defined barrier to control shortcut movements shall be incorporated into the design.

- 2) Pedestrians do not turn at right angles, but rather curve with a radius of 6 to 10 feet. These radii vary with the square of the speed.
 - 3) Adequate space at a crosswalk area for pedestrian accumulation shall be provided.
 - 4) Adequate space along major pedestrian corridors for street furniture and fixtures shall be provided.
 - 5) Buffer zones or shoulders shall be a part of the walkway design where possible. These areas shall contain a landscape buffer that separates the walkway from vehicular traffic. Where less than five feet of buffer is possible between walkway and street, continuous planted or grass areas should not be provided and the walkway shall be widened by two feet and placed adjacent to the back of the curb.
- C. The width of a sidewalk shall be based on the quality and characteristics of service as well as capacity. A well designed pedestrian path or sidewalk consists of three basic elements: (1) Pathway (2) Buffer zone and (3) Auxiliary Space. Pathways should be based on pedestrian flow rates and an acceptable amount of conflict. Buffer zones separating pedestrians from vehicular traffic may accommodate street furniture and other facilities related to and supporting pedestrian activities. Auxiliary space will provide areas for activities such as standing, sitting, window shopping, waiting for bus etc.

The following categories of pedestrian flows shall be used to establish acceptable walkway standards:

- 1) Open Flow - essentially no interaction among pedestrians. This service level shall be provided on the periphery of all station sites

and under any guideway segments where a path is provided.

Average pedestrian area is approximately 30 SF / person.

- 2) Unimpeded Flow – While some crowding occurs, the pedestrian is not generally influenced by others. This service level shall be provided on the station site, exclusive of the station proper. Average pedestrian area is approximately 20 SF / person.
- 3) Impeded Flow - Progressive movement can only occur through constant interaction with the movement of others, normal walking speeds are restricted. This service level shall be provided only in rush hour conditions in areas of exterior queuing only. Average pedestrian area is approximately 15 SF/ person.
- 4) Constrained Flow - A constant interaction between pedestrians which results in physical restrictions to the freedom of movement. Walking speeds are restricted requiring frequent adjustments of gait. This flow should only be employed for short peak times in the most confined queues. Average pedestrian area is approximately 10 SF / person.

1.02.5.5 Lighting

- A. Proper levels of illumination will reduce pedestrian accidents, and improve pedestrian security and area image. Minimum code requirements must be met.
- B. As important as the proper levels of illumination are the quality and consistency of the lighting. Uniformity between the sources in the station proper and the station sites should be maintained and a high quality light giving good color rendition shall be provided.

- C. A uniform light distribution pattern shall be provided. The light fixtures shall be placed so the illumination from one complements the other, producing an even brightness level.
- D. In order to reinforce the human scale of the station sites, it is desirable that fixtures in and near public spaces and along walkways shall be 12 feet or less in height.
- E. Normal lighting fixtures may be augmented by bollard lighting adjacent to walkways.
- F. Critical decision areas such as entrances and intersections shall receive higher levels of illumination.
- G. Lighting standards and fixtures shall be systemwide procurement items. (See Chapter 4, Section 4.07, Lighting Criteria and Architectural General Plans)

1.02.5.6 Landscaping

- A. A well defined landscape plan shall be incorporated into the overall pedestrian walkway design to enhance the quality and success of the movement system. Plant material shall be used where appropriate, to enhance the visual quality of a space or corridor, direct the movement of people, blend and soften various elements, such as buildings, and utility structures, or alter adverse microclimates to create a more pleasant environment.

- B. Plants may be used to form canopies, walls or floors with variations in height and densities, to provide traffic control, reductions of glare, and deter soil erosion.
- C. The type of landscape plant material used must be characteristic of low maintenance requirements, with consideration for watering, pruning, disease, weeding and seasonal growth characteristics.
- D. For detailed criteria and determining the use of plant materials, (refer to Volume V, Manual of Landscape Standards.)

1.02.5.7 Maintenance

- A. Pedestrian ways and other such facilities shall allow room for maintenance equipment access, not only for periodic upkeep of grounds, but also to the transit guideway and station structures.
- B. Items requiring frequent service, such as trash containers, telephones and light fixtures shall be located with consideration of ease of maintenance.

1.02.6 BIKEWAYS

1.02.6.1 Ordinances

- A. The location and design of bikeways shall conform to the applicable local ordinances.
- B. The Miami-Dade County Parks Department Standards for bikeway design shall be reviewed and used as a guide in coordinating or establishing bikeway design standards within the incorporated municipalities.

- C. For detailed criteria refer to (Volume V, Manual of Landscape Standards.)

1.02.6.2 Signing

- A. All bikeway routes must be clearly marked with adequate signing that is not only clearly understood by the bicyclist, but also by the motorist. Signing or markings shall be used to warn of hazardous conditions or obstacles, delineate bikeway right-of-way, and warn motorists and pedestrians of the presence of bike traffic. To ensure uniformity and recognition, the most current MDT standard signs and graphics shall be used.
- B. The following principles shall apply to the design and implementation of signing along bikeways:
 - 1) Signing shall be provided at all decision points. These signs shall be designed to inform bicyclists of directional changes in the route.
 - 2) Warning signs to motorists of a bikeway crossing shall be posted one-half block in advance of the encounter.
 - 3) Warning signs shall be provided to inform bicyclists of potential hazards posted 50 feet in advance of encounter.

1.02.6.3 Lighting

Within the station area, bikeways and their storage areas shall be properly lighted to assure:

- A. Safety and security in general, and particularly for commuter trips made during either early morning or late evening hours.
- B. Demarcation and direction of bikeway.
- C. Increase visibility of surface conditions.

- D. Delineate presence of obstacles such as vehicles, pedestrians or stationary objects.

1.02.6.4 Design

(See Section 1.03, Site Design Criteria, Manual of Landscape Standards, Architectural General Plans and Civil Engineering Directive Drawings.)

1.02.7 PLAZAS AND OPEN SPACE

1.02.7.1 Introduction

- A. An essential ingredient in the design of an urban pedestrian system is the provision of public spaces or plazas.
- B. Economics prohibit the creation of grand plazas or piazzas of the European variety, however, small areas capable of being enjoyed by many people can still be provided.

1.02.7.2 Location

- A. As site configuration and program requirements allow, the station entrance(s) should be designed as a small pedestrian plaza.
- B. The paving materials, landscaping, lighting and street furniture should indicate "entrance" and "public space".
- C. Where possible, the bus waiting area should be treated as a small plaza and designed to compliment the available shelter under the guideway or the entrance canopy.

- D. Areas at or near intersections of major pedestrian walkways should also be considered for provision of small public spaces. They shall not, however, interfere with the circulation patterns.

1.02.7.3 Surfaces

- A. The surface material used for a plaza or open space shall be designed for safety, ease of maintenance and visual compatibility with station architecture. The surface shall exhibit the following:
 - 1) Conforms to all applicable ADA guidelines.
 - 2) Firm and stable footing.
 - 3) Uniform grade with proper slopes for drainage.
 - 4) Texture and pattern related to different activities.
 - 5) Slip and trip resistant.

- B. Grade changes provided in a plaza shall be meaningful. They shall, therefore, be used for the following purposes:
 - 1) Create interesting spaces and vistas.
 - 2) Provide adequate surface drainage patterns.
 - 3) Permit accessibility throughout per ADA guidelines.
 - 4) Direct circulation patterns.

- C. Refer to the Manual of Landscape Standards for guidelines for the establishment of paving patterns and placement of elements within them.

1.02.8 STREET FURNITURE

1.02.8.1 Introduction

- A. Well designed street furniture, integrated with landscaping and lighting will help to insure that the walkways and public areas will enhance the neighborhood landscape.
- B. The street furniture should be designed so that it will compliment that which exists or set a new and more sensitive direction for future street furniture in an area.
- C. In general, street furniture must be attractive and inviting to use, yet be durable, reasonably vandal resistant and designed and installed so that areas of intense use are well drained.
- D. Certain objects/furniture shall be encouraged and planned for plazas and open spaces to increase the usability and generate meaningful focal points within the area. The objects/furniture that shall be considered include the following:
 - 1) Seating
 - 2) Trash containers
 - 3) Planters
 - 4) Fountains
 - 5) Sculpture
 - 6) Lighting
- E. Lighting standards/fixtures shall be systemwide procurement items. (See Chapter 4, Section 4.07, Lighting Design Criteria and the Manual of Landscape Standards.)

1.02.8.2 Maintenance

- A. Street furniture or other landscape structures shall be constructed of materials able to resist such climate related conditions as wood rot, rust, rodents, mildew, soil spoilage and moisture related deterioration of paving materials.
- B. Provisions shall be made to permit the easy access of maintenance and emergency vehicles to plazas and open space. The following conditions shall be met:
 - 1) Easy and clear access to the entry/exit system for maintenance and emergencies.
 - 2) Groupings of amenities (light poles, trash cans, water outlets, etc.) for ease of servicing and upkeep.

1.02.8.3 Visibility

- A. The shape of the space for plazas and open space areas, as well as location of landscape material and furniture, must not create blind areas hidden from public view. Also, the overall area shall be designed for ease of security surveillance at night.
- B. Adequate lighting is important, not only to security, but to the enhancement of an area's night landscape. The lighting shall be designed to avoid excessive glare and to avoid a harsh overly bright source that creates an uncomfortable feeling.

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1.03 SITE CONFIGURATION

1.03.1 INTRODUCTION

- A. The location and boundaries of station sites, adjacent street improvements, station location and column and pier placement have been established during Preliminary Engineering. The site layout relates to the surrounding area and its traffic patterns. Provisions for handling pedestrian and traffic flow have been based on projections made by the Preliminary Design Team and approved by MDT.
- B. Site design adheres to the architectural concept of a systemwide cost effective approach to design. By adapting to the unique subtropical climate of South Florida, conceptually consistent design will fulfill the functional, as well as aesthetic requirements. Landscaping shall be used extensively throughout the system to maintain visual continuity and to enhance the surrounding environment.
- C. Since the site design is influenced by availability and cost of land, existing access roads and station patronage requirements, the design must take advantage of the necessary compactness of each site. Therefore, site circulation shall be simple, direct and non-circuitous allowing for easy driver and pedestrian orientation.

NOTE: References in parenthesis remain to be cross referenced against criteria not yet updated.

1.03.2 MODE OF ACCESS PRIORITIES

1.03.2.1 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.

1.03.2.2 Pedestrians

All patrons accessing the stations become pedestrians before entry and for reasons of safety, the pedestrian mode shall be given first priority.

1.03.2.3 Buses

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

- 1) Bus bays, except where curbside drop offs are provided on adjacent streets, shall be located as close to the station entrance as possible.
- 2) Bus access to and from the site shall not be compromised by other modes of transportation.

1.03.2.4 Kiss-and-Ride

- A. Kiss-and-ride spaces allow high volumes of patrons to access stations in a 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.
- B. The term kiss-and-ride originated primarily in the development of transit sites where the need for a separate facility for short term drops off and pickup was necessary. In order to eliminate the congestion at station entrances caused by a spouse or friend driving the patron to the station, a separate yet close area must be provided.

- 1) The time necessary to drop someone at curbside is minimal. However, past experience has shown that very often, in the case of husband and wife, the husband will drive to the station, requiring the wife to change to the driver's seat.
- 2) Waiting time in the p.m. 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 the minimum waiting time anticipated.
- 3) In order to use this predominately peak hour facility efficiently, short term parking will be allowed in the kiss-and-ride spaces during the non-rush hours of operation.
- 4) Right hand drop off shall be provided where sight constraints allow.

1.03.2.5 Park-and-Ride

- A. Park-and-ride or long term parking, although the least efficient in terms of the physical facilities required, has proven by past experience to be a necessary facility for the success of transit systems. This facility, whether at grade or structured, 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.

1.03.2.6 Summary

- A. Summary of Mode of Access Priority:
 - 1) Pedestrian (including bicycles)
 - 2) Buses
 - 3) Kiss-and-ride (including taxis)
 - 4) Park-and-ride (including motorcycles)

1.03.3 PEDESTRIAN ACCESS

1.03.3.1 General

The relative importance of 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. Absolute separation of pedestrian from vehicular circulation is not necessary except in high traffic areas. The pedestrian values convenience and time over almost everything else, and will not use any grade separation structures unless they are very convenient. Sites have been designed to obviate pedestrian bridges and tunnels.

1.03.3.2 Approaches

- A. Pedestrian crossings at streets wider than four lanes should have a refuge area at least four feet wide between opposing lanes and shall be at street level to allow easy use by all patrons, including the physically challenged.
- B. 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.
- C. Pedestrian crosswalks shall have good visibility for both pedestrians and drivers. (See Chapter 2, Civil Design Criteria and Volume I, Chapter 3, Traffic Design Criteria.)
- D. Street or site lighting shall be placed at every pedestrian crosswalk.
- E. All pedestrian ramps shall meet ADA guidelines.

- F. Parking areas should be arranged to minimize the number of pedestrian crossings of streets and access roads which carry vehicular traffic.
- G. Pedestrians should have the right-of-way over vehicles at selected crossings for internal circulation.

1.03.3.3 Walkways

- A. 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.
- B. Opportunities for passing should be provided to allow fast walking pedestrians to pass easily.
- C. Effective width of exterior walks equals total width minus obstacles such as parking meters, poles, fire hydrants, trash cans, etc. An additional one and one-half feet fringe area per side should be subtracted due to the tendency of people to avoid walking close to walls or barriers.
- D. Minimum walkway width is eight feet. Minimum width near station entrances is twenty feet.
- E. Surges of people should be accounted for in walkway design since train arrivals, traffic signals and bus arrivals tend to concentrate flows of people.

- F. 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.

- G. Pedestrian walks bordering the outside of bus turning areas shall be placed outside the extreme radius described by the outer front corner of the bus.

1.03.4 VEHICULAR ACCESS - GENERAL

1.03.4.1 Entrances to Site

- A. Entrances shall be from secondary roads where possible, with provision for queuing space provided at their intersections with arterial roads.

- B. Entrances at intersections shall be placed directly at the intersection wherever possible, so that dog leg crossings are avoided. Intersections shall be 90° wherever possible.

- C. When patronage figures dictate more than one access point into the site and these points front on the same street, they shall be at least 150 feet apart. Lower volume access points, such as those for buses will be evaluated on a station-by-station basis.

1.03.4.2 Separation of Modes of Access

- A. 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.

- B. Where separation at the point of ingress or egress is not possible, this separation should occur as soon as possible into the site and adequate weaving space must be provided.

1.03.5 BUS FACILITIES

1.03.5.1 General

As stated in Section 1.03.2.3, buses shall be given priority in terms of vehicular access.

1.03.5.2 Bus Lanes

- A. Bus lanes shall be one-way only through the station site.
- B. To ensure the uninterrupted flow of bus traffic, separate access into and through the transit site shall be provided.
- C. Bus lanes shall be 20 feet wide minimum to allow buses in motion to pass stalled buses.
- D. Minimum turning radii shall be 50 feet outside dimension with 3.1 feet allowance for the front overhang of buses.

1.03.5.3 Bus Bays

- A. To alleviate the necessity of buses backing up to maneuver around others and to reduce the length required by in line bus bays, saw tooth bus bays shall be used wherever possible. For dimensions and configuration, (see Directive Drawings). In addition to standard Bus Bays, the Final Designer shall verify any requirements for larger, articulated buses.

- B. Bus bays shall be designed to allow loading and unloading of passengers from the right side of the bus to pedestrian paths.
- C. Where at all possible, bus bays will be oriented with respect to the station so that bus patrons do not need to cross traffic in order to reach the station entrance.
- D. Many of the inherent problems of convenience, pedestrian conflicts with moving traffic and shelter will be minimized by locating the bus bays immediately adjacent to the station entrance parallel to the guideway structure. (See Architectural General Plans.)
- E. Whenever possible, the guideway structure and/or the fare collection canopy shall be used to provide shelter for bus patrons.
- F. Where buses stop outside the site on adjacent public streets, separate pull off space, a minimum of 11 feet wide by 50 feet long, shall be provided if possible. (See Volume I, Chapter 3, Traffic Design Criteria".)

1.03.6 KISS-AND-RIDE FACILITIES

1.03.6.1 General

- A. Convenience and safety are prime design objectives.
- B. Kiss-and-ride facilities shall have second priority in vehicular access and where possible should have separate access points.
- C. Where possible, the guideway or parking structure should be used to protect patrons walking from kiss-and-ride spaces to the station entrance.

1.03.6.2 Access Roads

- A. Access roads shall be single lane yet allow space to maneuver around a stopped vehicle.
- B. Kiss-and-ride circulation shall be one way.
- C. When possible, the kiss-and-ride vehicle should be able to re-circulate on-site in the event a space is not available.
- D. Kiss-and-ride traffic shall not be routed through the park-and-ride areas.

1.03.6.3 Configuration

- A. When possible, kiss-and-ride spaces shall be oriented so that the waiting driver can watch the station exit.
- B. 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 non-peak hours, site constraints will dictate whether drive through or dead end spaces are provided. (See Architectural General Plans for further detail.)
- C. Whether drive through or dead end spaces are provided, the preferred configuration is that of an angle of 45 degrees to 60 degrees to the direction of travel to enhance maneuvering.
- D. Spaces shall be a minimum of 10 feet by 20 feet.

- E. Drop off zones should be incorporated into the kiss-and-ride areas to promote better a.m. service and for taxis when they cannot use kiss-and-ride spaces in the non-peak hours.
- F. Each drop-off space in any given drop-off zone shall be a minimum of 10 feet wide by 30 feet long.

1.03.7 PARK-AND-RIDE FACILITIES

1.03.7.1 General

- A. Park-and-ride facilities shall be provided at stations outside of the CBD. 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 General Plans for specific station requirements.)
- B. 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 General Plans for park-and-ride requirements.)
- C. Street access to parking areas should be designed in keeping with good traffic engineering and planning practice. (Refer to Volume I, Chapter 3, "Traffic Design Criteria".) Internal circulation for parking areas should be separate from other vehicular modes.
- D. 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.

- E. The facilities for park-and-ride should be designed for self-parking.
- F. Ninety degree parking is preferred and should be used wherever possible.
- G. Parking spaces shall be 9 feet by 20 feet minimum. (See General Plans for parking bay sizes.)
- H. Traveled lanes shall have a minimum radius of 16 feet inside dimension.
- I. All parking areas shall be designed to permit ease of maintenance.
- J. Dead end lanes should be avoided even if this results in fewer paces being provided.
- K. If dead end lanes cannot be avoided, they should be used for motorcycle spaces.
- L. Motorcycle spaces shall be four feet wide by eight feet long. Where exposed to sunlight, the paving for motorcycle spaces shall be concrete.

1.03.7.2 At-Grade Parking

- A. 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.

- B. Although landscaped, the parking areas should be open enough to maintain good surveillance. Refer to Miami-Dade County Standards for parking.

1.03.7.3 Parking Structures

- A. Parking garages shall be concrete structures and conform to the criteria set forth in (Section 1.03.7.1.)
- B. Structures shall conform to the Florida Building Code, and shall be designed to be classified as "open structures".
- C. The design shall be simple, functional, economical and with minimal ornamentation of any kind. Architectural compatibility with the stations will be achieved through similarity of materials, construction methods and landscaping. (For further details, refer to General Plans and Directive Drawings.)
- D. Because of budget constraints and potential increase in demand, parking structures will be designed for expansion or uncovered at-grade parking will be provided initially with expansion to structured parking at a later date.
- E. Space shall be provided for elevators in the event the parking structures exceed 3 levels (2 levels above grade).
- F. Elevator locations shall be as close as practical to the station entrance.
- G. Parking structures shall conform to the following:

- 1) Minimum vehicular clearance height 7'- 6"

NOTE: ADA requires 8' – 2" clear for accessible vans. Check current codes for location of such vehicle.

- 2) Ramp grades:
 - a. Parking on ramp Five percent maximum
 - b. No parking on ramp Five percent desirable
- 3) Width of entrance/exit lanes 12 feet
- 4) Aisle turning radii
16 feet inside
30 feet outside
- 5) Curb height 6 inches

1.03.8 SITING OF TRACTION POWER SUBSTATIONS AND GAP TIE STATIONS

1.03.8.1 Traction Power Substations

- A. These substations, consisting of enclosed rectifiers and transformers in open courtyards must occur at every station site or as determined in Preliminary Engineering.
- B. Since their placement on the site is critical in terms of safety, economy and access, no deviation from the location shown on the Preliminary Plans will be accepted without the written permission of MDT.

1.03.8.2 Gap Tie Substations

These substations, placed along the guideway, are critical to train operations. Their placement is shown on the Preliminary Plans and no deviation from the location shown will be accepted without the written permission of MDT.

1.03.9 BICYCLE FACILITIES

1.03.9.1 General

- A. Provisions will be made for access to and from stations by bicycle, including their storage at station sites.
- B. Bicycle racks shall be placed near the station entrance, preferably under the guideway at the end of the concourse, opposite the ancillary facilities, or for median alignment stations, near the entrance.
- C. Bicycle lockers, if used, should be similarly placed, or should be placed in parking structures, if any. Their placement shall not compromise pedestrian walkways nor deter from the architectural quality of the station.

1.03.9.2 Bicycle Paths

- A. Bicycle paths shall be provided as an integral part of the guideway linear park and should continue as uninterrupted as possible. These must accommodate both bikers and pedestrians.
- B. Where bicycle paths meet with station areas where pedestrians are encountered, they shall remain separate from pedestrian walks. Where separation is not possible, bikers are expected to walk their bicycles and no special provisions shall be made, such as wide turning radii, in these areas.
- C. Bicycle paths shall be a minimum of eight feet wide.

- D. Turning radii shall be as follows:
- 1) Station 15 feet minimum - 30 feet desirable
 - 2) Station areas 20 feet minimum - 40 feet desirable bikeway transition.
 - 3) Bikeway 35 feet minimum – 100 feet desirable
- E. (For detailed criteria, refer to Volume V, Manual of Landscape Design Standards.)

1.03.10 LINEAR PARK

1.03.10.1 General

- A. Where guideway location, configuration and right-of-way permit, a linear park shall be designed to make full use of the right-of-way and to enhance the surrounding environment.
- B. A continuous pathway for pedestrians, bicyclists, maintenance and emergency vehicles will be an integral part of the linear park.
- C. Since for economic reasons the linear park cannot be as heavily landscaped as the station areas, special attention should be given to the transition areas between the park and the station site. These transition areas are not only for landscaping, but for activity as well.
- D. Refer to the Manual of Landscape Design Standards (and Architectural General Plans.)

1.03.11 SIGNAGE, GRAPHICS AND LIGHTING

(Refer to Manual of Graphic Standards, Section 4.07 of this criteria, "Electrical Criteria" and Architectural General Plans.)

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1.04 STATION CONFIGURATION

1.04.1 SCOPE

The following criteria define the architectural functional planning of transit stations and related major functional areas. They are documented in the following subsections to provide proper coordination of all elements affecting the security, comfort, safety and convenience of transit patrons within the station proper.

1.04.1.1 General

- A. Final Designers shall develop each station based upon the influence exerted on the basic station concepts described herein by specific site and alignment conditions, entrance considerations, projected patronage, and the needs of individual neighborhoods served by the transit facility.

- B. To this end, Final Designers are responsible for the final design of the station structure, the detailing and design of station interiors and exteriors and the selection of materials within the constraints of established station design criteria.

The detailed development of this policy as it affects specific station elements is contained in applicable sections of the Architectural Design Criteria as defined in this volume.

- C. In order to provide overall guidance in the final design phase of station development, aesthetic considerations and judgments made by the Final Designer will be reviewed and approved by MDT and its designates representative.
 - 1) Architectural concepts shall utilize a cost effective basis for design.

- 2) Station design shall be sensitive to the subtropical environment of Miami-Dade County with emphasis on openness, natural ventilation, landscaping and acceptable local building materials.
- 3) Station circulation, based upon projected patronage, shall be simple, direct and open.
- 4) Major functional areas shall be spatially and visually related.
- 5) Design consideration shall be given to patron comfort, weather protection, safety and security.
- 6) Specified materials and finishes shall be used in a consistent manner throughout the station complex.
- 7) Special conditions shall be avoided through standardization and repetitive element economy.

1.04.2 STATION CONFIGURATION

1.04.2.1 Station Type

- A. As a result of system definition regarding station location, service and operational requirements, guideway alignment, and right-of-way characteristics, the aerial center platform station was the predominant configuration for the Stage I Rapid Transit System and is the preferred configuration for new line extensions.
- B. In situations where specific site alignment and operational conditions preclude the use of the aerial center platform station, side platform stations may be used.

1.04.2.2 Station Levels

- A. There are usually four functional levels which contribute to station configuration.

- 1) Street Level: The initial point of the transit trip sequence which includes areas of the station site immediately adjacent to the unpaid area of the station entrance.
 - 2) Concourse Level: A concourse area shall be provided to monitor and contain fare collection and vertical circulation to the train loading platform(s) above. Depending on site specific conditions and station configuration, the concourse may be elevated or at grade. The concourse is usually divided into unpaid and paid areas.
 - 3) Platform Level: The platform level provides train boarding and alighting areas for patrons. Station entrances shall not enter directly onto the platform level. All platforms shall have a canopy to provide weather protection.
 - 4) Track Level: The track level provides operational facilities for train movements and is a functional determinant for station platform elevation. The top of the platform is the top surface of the finished floor ignoring the raised bumps on the platform edge warning strip, and shall be located 43 inches above the top of rail elevation to provide horizontal access from the platform to the transit vehicle.
- B. All transit stations for the Miami-Dade System are bi-level in gross conceptual configuration separating the platform/guideway from grade. Where site specific conditions, operational constraints or the potential intersection with future transit lines dictate otherwise, additional station levels may occur as necessary.
- C. Although the arrival mode of access at individual stations will vary according to site specific conditions and patronage demand, patron use of station elements and station levels shall conform to similar criteria.

Basic patron circulation at stations shall be designed to function in a standardized manner to promote patron familiarity with circulation patterns on a systemwide basis.

1.04.2.3 Station Sites

- A. Station sites include large areas designed for vehicular movement and parking. Areas designated for station facilities represent, in most cases, only a small portion of the total site. The further development of station sites with particular emphasis on the accommodation of bus, automobile and pedestrian movements is described in Section 1.03 of the Architectural Design Criteria dealing with Site Configuration.
- B. Station platform location, as indicated by the preliminary engineering shall be considered as a given based upon land availability, required site development and the accessibility of transit facilities to other forms of surface transportation. Any deviation from the preliminary engineering documents shall have prior approval from MDT.

1.04.3 STATION LOCATION

1.04.3.1 General

- A. Station sites shall include the functional boundaries of concourses, platforms, ancillary facilities, parking facilities, entrances, bus bays, kiss-and-ride areas, circulation patterns and relationships to surrounding streets and buildings.
- B. Within the constraints of established station design criteria, consideration shall be given to station compatibility with potential future developments in neighborhoods common to each station as shown on the General Plans.

1.04.3.2 Concourse and Platform Location

- A. The horizontal location of both the concourse and platform will generally coincide. The extent of the concourse is dependent on the arrangement of vertical circulation elements and entrance location.
- B. Station platforms are of fixed dimensions and are located by horizontal control project coordinates, based on the Florida State Plane Coordinate System. Station platform centerlines, platform end limits and future expansion limits shall be indicated on the Preliminary Engineering documents.

1.04.3.3 Entrance Location

- A. The location, capacity, and required number of station entrances are a major determinants of station configuration.
- B. Station entrances shall be placed near patron origin and destination points and shall be integrated, as far as possible, with other transit modes serving the station. Where practical, efforts shall be made to locate station entrances to complement and enhance existing pedestrian circulation patterns.
- C. The criteria for station site entrances and their relationship with station entrances have been developed simultaneously with criteria for station site development in Section 1.03 of the Architectural Design Criteria.

1.04.4 PATRONAGE

- A. Planning of the total transit system and of individual stations is dependent upon the expected patronage at each station. Patronage

projections for all phases of system development shall be determined by MDT.

- B. The configuration of patron circulation elements and the amount of fare collection equipment required at each station is derived from patronage figures, and shall be indicated on the Preliminary Engineering documents.

1.04.5 STATION CONCOURSE CONFIGURATION

1.04.5.1 General

- A. The concourse functions as a transition area between the points of entry into the station and the vertical circulation elements leading to the train loading platform. The concourse provides space for various functions including the entire fare collection process, the Station Attendant's booth, directional and informational signing, and various amenities for the patrons' comfort and safety.
- B. The location of all elements associated with concourse functions are described or shown in detail in applicable sections of the Architectural Design Criteria and Architectural Directive Drawings.

1.04.5.2 Concourse Location and Configuration

- A. Concourses for aerial center platform stations will generally occur at grade level to facilitate inter-modal surface transfer and patron access unless site conditions and operational factors dictate otherwise. Aerial concourses for the center platform station shall maintain a minimum clearance of 14 feet 6 inches from the underside of structure to grade, to facilitate the passage of emergency vehicles.

- B. Concourses for aerial side platform stations will generally occur at a specified elevation above grade to allow a minimum clear dimension of 16 feet 6 inches below structural elements in those areas of the alignment where the station is located above and parallel with street medians.
- C. The length of station concourses is independent of platform length and shall be of sufficient size to accommodate fare collection installations and vertical circulation elements linking the concourse to platform areas. The latter shall consist of the appropriate number of escalators, stairs and elevators required by patronage forecasts and emergency egress requirements.
- D. The organization of station circulation shall be planned to meet both limited and extensive emergency situations. In emergencies, it must be possible to move patrons efficiently and rapidly from the trains, platforms, and other parts of the station to an area of safety as prescribed in NFPA 130.

1.04.5.3 Queuing

- A. The planning of all systemwide patron circulation elements depends upon strict adherence to a series of interlocking clearances and queuing dimensions related to the operational speeds of vertical circulation and fare collection equipment and upon the surveillance requirements of the Station Attendant.
- B. Architectural Design Criteria relating to fare collection contains minimum dimensions to be used in determining queuing spaces and additional relationships with vertical circulation elements in the concourse area.

Consideration shall also be given to provisions for exiting through this area in emergency egress situations.

1.04.5.4 Circulation

- A. Patrons entering the "unpaid" area of the concourse shall arrive at a point which can be either directly or remotely observed from the Station Attendant's booth. Remote surveillance of critical areas of the concourse shall be handled by CCTV.
- B. Patron circulation from the concourse to the station platform shall be planned in a right hand pattern where practical. If station configuration dictates a left hand pattern, this pattern shall be consistent throughout the following sequences. Conflicting circulation patterns shall be avoided.
- C. After entry, patrons shall proceed through the fare collection sequence which must be planned for the clearance and queuing requirements indicated in Section 1.10, Fare Collection of the Architectural Design Criteria. Fare collection is governed by the number of patrons using each station. The amount of space involved is dependent upon the patronage projections for each station. The fare collection operation shall take place in full view of the Station Attendant's booth.
- D. After passing through the fare gate array, patrons will proceed to the train boarding platform(s) via escalators, elevators and stairs as described in Section 1.05 of the Architectural Design Criteria dealing with Vertical Circulation. Escalator and stair facilities shall be located in the "paid" area arranged to minimize the number of decision points and

circulation conflicts at the concourse level and to maximize the even distribution of patrons at the platform level.

- E. Elevators between concourse and platform levels are intended for the use of those who would have difficulty using escalators or stairs. Elevators shall be located centrally in the concourse "paid" area within the immediate vicinity of the Station Attendant's booth to facilitate surveillance. Each Station shall have 2 elevators in order to provide uninterrupted customer service when an elevator is closed for maintenance.
- F. Passengers exiting stations shall proceed in a manner opposite to that described for entering patrons, following a right hand or consistent left hand circulation pattern from platform to vertical circulation elements through exiting fare gates into the concourse "unpaid" area and out of the station entrance.

1.04.5.5 Mechanical and Electrical Systems

- A. Concourses for both center and side platform stations shall be considered as protected open spaces not requiring mechanical ventilation.
- B. Mechanical and electrical systems which service various elements in the concourse shall be integrated with the station structure so that conduits, cableways and other system elements are not exposed to public view.
- C. Where practical, concourse floors shall pitch to drain from the longitudinal floor centerline toward longitudinal perimeter areas at an average rate of one percent. (1/2 of one percent minimum)

1.04.5.6 Heights and Vertical Clearances

- A. Concourse to platform heights shall comply with the minimum queuing distances established in Section 1.05 of the Architectural Design Criteria – vertical circulation.
- B. Concourse to platform heights for aerial side platform stations shall be dependent upon vertical clearances required above vehicular traffic lanes flanking the transit right-of-way.

1.04.6 STATION PLATFORM CONFIGURATION

1.04.6.1 General

- A. Platform configuration is a main determinant of station configuration. Train boarding and alighting platforms will be either one of two acceptable configurations: (a) center platform, (b) side platform. Platform configuration to be utilized will be a function of track alignment and profile.
- B. For typical dual track station configurations, center platforms are more efficient than side platforms in terms of the required amount of circulation space, vertical circulation elements, fare collection areas and related fare collection equipment.

Duplication and redundancy of circulation space, station elements and system personnel are required by utilizing side platforms. Consequently, side platforms are used only when center platforms are not feasible.

- C. The platform shall function to provide:
 - 1) a protected waiting area for patrons;

- 2) an adequate movement area for high activity circulation during train loading and unloading.
- D. Vertical circulation elements shall be arranged on the platform to achieve efficient dispersal of patrons along its length while maintaining adequate queuing space for each element.
 - E. Only transit related elements shall be located at the platform level and their number minimized to provide adequate circulation space.

1.04.6.2 Platform Dimensions

- A. Length: Aerial station platforms shall be designed to accommodate a 6 car train and shall be designed to have a minimum overall length of 456 feet.
- B. Width: Unless otherwise approved by MDT platform widths shall be designed to allow (except at structural columns) a minimum clear dimension of 7'-8 inches from the inside edge of the platform edge to the closest inboard obstruction. This dimension is equivalent to the space required for two patrons traveling in opposite directions to pass a standing patron without entering a safety zone 24 inches in width along the platform edge. Minimum platform width for center platform stations is 25 feet 3 inches. Minimum width for side platform stations, exclusive of vertical circulation landings, is 12 feet 6 inches. In addition to providing appropriate circulation space the 7'-8" clear zone is important to reduce electrical shock initiating from return current.

For round columns the 7 feet 8 inch clear space can be reduced to 7 feet 6-1/2 inches for a longitudinal distance not greater than 11 inches.

- C. Transverse Clearances: As per Volume III Guideway Design Criteria, Chapter 2 Civil and Trackwork Design Criteria.
- D. The track centerline distance for center and side platform stations is 35 feet 10 inches and 14 feet, respectively, unless otherwise approved by MDT.
- E. All pertinent dimensions and structural details are further defined in the Architectural Directive Drawings.

1.04.6.3 Platform Structure

- A. Unless site, alignment and operational factors dictate otherwise, the preferred center platform station configuration is independently supported from the guideway structure.
- B. Unless site, alignment and operational factors dictate otherwise, the preferred side platform station is integral with the guideway structure.
- C. Precast, structural concrete members shall be utilized in all areas of station configuration which can benefit from repetitive element economy.

1.04.6.4 Platform Edge Strip

- A. Platforms shall have a 24 inch wide, anti-skid tactile surface installed continuously along all platform boarding edges. The edge strip may be natural stone, concrete, terrazzo, or synthetic material as approved by MDT.

- B. The platform edge strip shall be designed to differ in color, texture and material from the platform paving material.
- C. The platform edge strip will be the same for all stations on a systemwide basis.
- D. Platform edge details are further defined in the Architectural Standard and Directive Drawings.

1.04.6.5 Platform Well Openings

- A. Well openings at the platform level shall be consistent in dimensional length and width for all stations and shall be located uniformly along the length of the platform.
- B. Well openings shall be designed to be sufficient in size to allow for the comfortable passage of escalator, stair and elevator closure elements. The minimum clear width of all platform well openings shall be 7 feet 8 inches allowing 24 inches in excess of a 5 foot 8 inch width single, Class "A" or Class "B" escalator.
- C. Well opening enclosures shall be a minimum of 42 inches in height extending completely to the floor surface (no toe opening).
- D. Well opening enclosures shall be designed to be as transparent as practical for surveillance purposes. A solid curb base shall extend a minimum of 4 inches above the floor surface for maintenance purposes.

1.04.6.6 Planning Module

The placement of all floor joints, well openings, floor installed drains and access cover plates, shall be coordinated with the longitudinal station planning module of 8 feet. Refer to Section 1.09 dealing with Materials and Finishes for additional criteria.

1.04.6.7 Mechanical and Electrical Systems

- A. Platform areas of aerial transit stations shall be considered as protected open spaces and will not be mechanically ventilated.
- B. Platform electrical installations, including lighting, public address and CCTV systems, shall be integrated with the platform and canopy structure.
- C. Both center and side platforms shall be sloped to drain toward the trackway at an absolute rate of one percent.

1.04.7 STATION CANOPY CONFIGURATION

1.04.7.1 General

Platform canopy design shall be consistent with system construction and shall be in conformance with the Directive Drawings and related criteria sections.

1.04.7.2 Environmental Protection

The station platform shall be designed to accommodate a canopy structure which will afford adequate weather protection against conditions that can reasonably be anticipated in Miami-Dade County. Generally, patrons at the platform level shall be protected from direct sun or wind driven rain when the maximum intrusion angle is within 45 degrees of the zenith.

1.04.7.3 Dimensions

- A. Length: Station canopies shall be designed to provide adequate weather protection for all vertical circulation elements and shall have a minimum length of 324 feet 6 inches for center platform stations and 285 feet for the side platform stations.
- B. Width: Canopy width is a function of weather protection and shall extend at least 2 feet 6 inches over the track centerline to protect the patron boarding and exiting the train from wind driven rain. The minimum width of the canopy structure is approximately 40 feet 10 inches for center platform stations and 32 feet 6 inches per platform for side platform stations and shall comply with the clearances indicated on the Standard and Directive Drawings.
- C. Height: An absolute dimension of 9 feet 10 inches shall be maintained from the underside of the canopy to the surface of the station platform at the supports to provide adequate weather protection and to ensure proper transit vehicle clearances.

1.04.7.4 Canopy Structure

- A. Center platform canopy structures shall be constructed of concrete and supported in such a way that the structure does not intrude into the clear space as described in 1.04.6.2. The platform and canopy structures shall be independently supported from the guideway structure as indicated in the Architectural Directive Drawings.
- B. Side platform canopy structures shall utilize the guideway bents as their point of support. Guideway bents shall support the canopy structure and simple span platform girders placed parallel with the guideway. The

canopy structure shall provide coverage for both platforms. An opening in the canopy, as configured in the Directive Drawings, shall be provided at the dual guideway centerline to admit natural light and ventilation into the interior of the station.

1.04.7.5 Mechanical and Electrical Systems

- A. All electrical installations shall be integrated with the canopy structure in an orderly and systematic design. Exposed conduit on the underside of the canopy structure shall not be permitted.
- B. Positive drainage, collection of rainwater and emergency scuppers shall be provided in the design of canopy structures in accordance with applicable codes.

1.04.8 STATION ANCILLARY FACILITIES

1.04.8.1 General

- A. Ancillary facilities shall be provided at all stations and shall typically be located at grade. Refer to the Directive Drawings for configuration and location.
- B. Specific requirements for train and station operation related ancillary spaces are specified in Section 1.07 of the Architectural Design Criteria and are further defined in the Architectural Directive Drawings.

1.04.8.2 The following spatial components typically constitute the functions contained in the ancillary spaces for each station. These spaces will be separated from public spaces and will not be accessible to unauthorized personnel.

- A. Service Spaces:
 - 1) Custodial room

- 2) Trash room
- 3) Controlled access toilet room
- 4) Maintenance storage room

B. Mechanical Spaces - Mechanical equipment room:

C. Electrical Spaces:

- 1) Electrical room
- 2) Electrical equipment room

D. Transit Operation Spaces

- 1) Train control and communication room
- 2) Train control and communication battery room
- 3) Revenue room

E. Terminal Station Spaces:

- 1) Trainmen's room

1.04.8.3 The traction power substation shall be housed in a building independent of station related ancillary facilities and shall be located at a distance which is not greater than 500 feet from the centerline of the transit station. Refer to the Directive Drawings for prototypical room layouts and building configuration.

1.04.9 STATION BARRIERS

1.04.9.1 General

- A. Barriers throughout the System shall generally consist of two types: free-standing balustrades, screens and gates separating various areas of

patron circulation, and parapets and railings surrounding horizontal openings.

- B. All barriers other than free-standing railings, gates and fare area enclosure screens shall be designed as solid, partial height walls. Where design solutions call for parapets higher than their code required railings, handrails shall be attached to the parapet face; where parapets are lower, handrails shall be top mounted as prescribed by Code.
- C. Doors shall be used only for purposes of security and patron convenience, and their use shall be held to a minimum.
- D. Placement of doors other than those required for security purposes across paths of patron circulation shall be expressly prohibited.
- E. Where bars, slats, or pickets are used, the maximum spacing shall adhere to the prevailing code.
- F. Fences should be non-climbable with horizontal members near the top and bottom only, except at ceiling high fences.

1.04.9.2 Concourse Enclosure Barriers

- A. Means must be provided to secure the station when the station or entire system is shut down. This will occur on a daily schedule and during emergencies, after the station has been cleared of all patrons.
- B. Closure barriers shall be located to minimize the amount of system property and equipment exposed to public abuse. The closure of barriers will be performed by the Station Attendant or other appropriate

system employee from within the entrance enclosure. Barriers shall be designed to be non-obstructing, securely enclosed and vandal-proof when not in use.

- C. Such enclosures shall be a major factor in the establishment of individual station identity, and their configuration and materials shall be the responsibility of the Final Designer, subject to the provisions of applicable Station Design criteria.
- D. Concourse enclosure barriers shall be designed to be as open as possible for surveillance purposes and shall maintain a vertical dimension of at least 9 feet from finished grade as indicated in the Architectural Directive Drawings.

1.04.9.3 Fare Collection Barriers

The fare collection barrier height shall correspond to the height of the fare collection machines, and shall be mounted between the ends of the fare collection array adjacent structure. Detailing of the barrier shall be compatible with the design of the station fare collection equipment and the design of the concourse enclosure.

1.04.9.4 Access and Emergency Egress

- A. Each secured station shall have at least two means of emergency egress. (See Section 1.05.1 F for surge factors)
- B. Each station must have at least one access door for use by system personnel when the station is secured.

1.04.9.5 Platform Barriers

- A. Barriers are not required by platform functions in any station except as directed by MDT.

- B. Platform end conditions for aerial stations shall be equipped with solid parapet walls 42 inches in height, and emergency gates as indicated in the Architectural Directive Drawings.

1.05 VERTICAL CIRCULATION

1.05.1 INTRODUCTION

- A. Within each of the transit stations of the new Metrorail Line Extensions, there are movement systems, including escalators, elevators and stairs which provide for the efficient transporting of patrons between the station's basic levels. In most cases, this involves movement from the concourse level at grade to the platform level above. In stations where grade level concourses are precluded, vertical movement includes passage from grade level up to the concourse level, and then to the station platform above.

- B. These vertical circulation elements are Systemwide elements constrained by systemwide criteria contained within this document. Each escalator and elevator type throughout the System shall be alike and may be purchased and installed as part of separate systemwide procurement contracts. Standard design of both escalators and elevators in the System shall make it possible for an early procurement which in turn shall accommodate extensive production lead times, thus properly interfacing with the System's overall construction sequence.

- C. Systemwide escalator and elevator procurements will encourage a reduced cost per unit, as well as lower life cycle maintenance costs due to like parts, part availability, and the familiarity of the maintenance staff with one unit type. In addition, the extremely heavy use these elements will receive, coupled with functional requirements unique to transit stations, necessitates the purchase of escalators and elevators which are different from typical commercially available units.

- D. The Final Designer shall be responsible for the preparation of those contract documents which are needed to define and describe that which is required to accept and properly interface with these elements.

- E. The Architectural Design Criteria will generically describe the nature of the escalators, elevators, and stairs. The A/E of record will determine the number of each element, its size and its respective location. Generally, only one escalator, one elevator(2 are required for Customer Service), and one stair are required between major station levels to accommodate the station's peak patronage. However, to meet Customer Service, ADA, and NFPA-130 requirements the minimum number of escalators, elevators, and stairways will be two of each. However, additional vertical circulation elements may be required to satisfy the Emergency Exiting Criteria as set forth in NFPA 130. The Final Designer shall complete the final Emergency Exiting Criteria calculations as required by these criteria as part of his Design Analysis Report described in the Professional Services Subcontract for Stations.

Minor station areas, if any, shall be treated based upon an analysis of actual passenger flows.

This final calculation shall utilize the most current information at that date, including revised information such as mode-of-access data. This will help determine the proper number and size of the vertical circulation elements which will be included within the station structure.

- F. NFPA 130 requires that a surge factor be applied when calculating patronage.

For 3 minute headways, use a surge factor of 1.7

For 6 minute headways, use a surge factor of 1.5

For 9 minute headways, use a surge factor of 1.3

- G. The Procurement Drawings, when given to the station Final Designer, will describe what is required to provide for and interface with the vertical circulation elements of each station. In addition, these drawings will describe each elevator or escalator in sufficient detail to insure successful interface. There are a number of general criteria which have been utilized in the station Basis for Design work and which should be kept in mind during the station's Final Design effort.
- 1) The vertical circulation elements have been quantified, sized and placed within each station to provide the highest level of patron convenience, comfort and safety.
 - 2) The escalators have been placed to encourage their use in preference to stairs.
 - 3) The vertical circulation elements have been placed to evenly distribute patrons along the full length of the station platform while at the same time collecting and directing them through the station's concourse.
 - 4) All exposed metal finishes on all vertical circulation elements shall be stainless steel.
 - 5) Moving ramps and stationary ramps will not be used in the public areas of all stations and station sites.
 - 6) All escalators and elevators within the System shall conform to the prevailing standards and provisions of the American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, Moving Walks, and the Florida Building Code.

1.05.2 ESCALATORS

1.05.2.1 Key Determinants

- A. All escalators within the new Metrorail Line Extension shall be reversible escalators, capable of operating under full load conditions in both the up and down directions.
- B. All escalators shall have a 48 inch nominal width dimension as defined by the ANSI code.
- C. All escalators shall have solid balustrades clad with rigid stainless steel. There shall be no escalators within the System with glass balustrades. Stainless steel cladding shall be procured as part of the escalator contract.
- D. All escalator trusses shall be enclosed with acoustically insulated, fire resistant, stainless steel panels.
- E. Escalators shall be used by transit patrons and are not intended to be utilized as a means of moving station maintenance or service elements.
- F. Escalators shall be commercial grade unless otherwise directed by MDT. Structural support and openings shall not preclude the use of escalators built to APTA guidelines.

1.05.2.2 Escalator Directive Drawing Composite

- A. The truss and balustrade outlines shown on the Architectural Directive Drawings represent a composite of the various size requirements for the escalators. Therefore, the size of the structural opening shall remain as shown on the Directive and Standard Drawings.

- B. The escalator working points and their respective dimensional relationships to the station structure are fixed. Every escalator manufacturer must utilize these working point placements as constants.

1.05.2.3 Escalator Class

- A. An escalator with a true vertical rise of less than 20 feet shall be considered to be a Class "A" escalator.
- B. An escalator with a true vertical rise of 20 feet or more shall be considered to be a Class "B" escalator.

1.05.2.4 Escalator Treads

- A. All Class "A" escalators shall have a minimum of 1-1/2 level treads exposed to form a horizontal platform at "fade out" at both the upper and lower landings.
- B. All Class "B" escalators shall have a minimum of three level treads exposed to form a horizontal platform at "fade out" at both the upper and lower landings.

1.05.2.5 Escalator Rise

The "rise" of an escalator is the true vertical distance measured between the two escalator working points.

1.05.2.6 Escalator Slope

All escalators shall be installed with the line of their step nosings ("slope") 30° from the true horizontal.

1.05.2.7 Escalator Speed

All escalators shall operate at a speed of 100 feet per minute in both the up and the down directions, fully loaded.

1.05.2.8 Escalator Headroom

The preferred minimum headroom above all escalators shall be 10 feet minimum, measured vertically from a line in the plane of the escalator nosings.

1.05.2.9 Escalator Capacity

All escalators, given their 48 inch nominal width and 100 fpm operating speed, shall have a nominal capacity of 90 people per minute in both the up and down directions.

1.05.2.10 Escalator Queuing Space

A minimum patron queuing space 30'-0" long (measured from the escalator working point) and 6'-0" wide, totally free of all vertical or horizontal obstructions, shall be provided at both the upper and lower escalator landings. This minimum open space requirement is intended to insure the proper functioning of each escalator specifically in terms of its operational safety within the station. Overlap of adjacent queuing space shall not occur.

1.05.2.11 Escalator Landing Plates

All escalator landing plates at both the upper and lower landings shall be completely level. The finished floor shall pitch down and away from these landings as indicated on the Architectural Directive Drawings.

1.05.2.12 Escalator Area Lighting

As indicated within the Lighting Criteria, Section 4.07 of the Electrical Design Criteria, the escalator landings shall be provided with a level of illumination intended to increase the escalator's operational safety.

1.05.2.13 Escalator Operation

- A. A key operated switch shall be provided at the escalator's newel panel at both the upper and lower landings, the purpose of which shall be to turn the escalator ON and OFF.
- B. A key operated switch shall be provided at the escalator's newel panel at both the upper and lower landings, the purpose of which shall be to change the escalator's direction of travel.
- C. An "emergency stop button", placed behind a cover which when raised will trigger audible alarms both at the escalator and within the station attendant's booth, shall be accessibly located at the escalator's newel panel at both the upper and lower landings. This "emergency stop button" shall be placed such that it is protected from accidental operation. It shall not be possible to start the escalator or restart it with the "emergency stop button".
- D. All escalators shall be equipped with two braking systems. The first brake will bring the escalator to a gradual and controlled safe stop in the event that a power failure occurs. The second brake will bring the escalator to an immediate stop in the event an "emergency stop button" is activated, or any of the other safety devices, as required and defined by the ANSI A17.1 code are caused to function.

- E. All escalators shall be equipped with red and green indicator lights to show the direction of the escalator's movement. This is intended to prevent patrons from entering an escalator running opposite to their direction of travel. These indicator lights shall be placed in the escalator's newel panel facing the patrons as they approach the escalator at both the upper and lower landings. The indicator lights shall be adjacent to and coordinated with the keyed direction switch and the "emergency stop button".

- F. The station attendant's booth shall be equipped with an escalator enunciator panel which shall indicate the following:
 - 1) The operational status of each escalator; whether it is ON or OFF and in which direction it is traveling.
 - 2) The functional status of each escalator; whether it is malfunctioning or stopped due to malfunction.
 - 3) The status of the "emergency stop buttons" at each escalator with both visual and audible indicators.
 - 4) The status of fire and smoke detectors for each escalator.

- G. All escalators shall be equipped for "inching" during maintenance and inspection.

1.05.2.14 Escalator Pit

All escalators shall contain a lower pit as indicated on the Architectural Directive Drawings. The escalator pit shall contain either a sump pit or a floor drain.

1.05.2.15 Escalator Machinery Location

All machinery which is required for both Class "A" and Class "B" escalators shall be contained within the escalator truss and its enclosure. This shall apply to all escalators, whether their drive mechanisms are contained within the truss on the incline or at the upper landing.

The designer shall design the Escalator Machinery Enclosure with sufficient room to perform inspection and routine maintenance without removal of equipment or wiring.

1.05.3 ELEVATORS

1.05.3.1 General

- A. The placement of the elevators at the center of the station's circulation areas will ensure maximum utilization and will enhance the elevator's surveilability by the station attendant, as well as by the many other patrons utilizing the System. Even when the attendant is not looking, the elevator user at the center of activity will feel that the elevator is being watched. The safety in which these elevators may be used will encourage even greater use.
- B. At least one elevator connecting major station levels shall be located to reduce the patron's total travel distance within the station while insuring good surveilability from the station attendant's booth. Generally, both elevators should be in close proximity to further enhance customer service in the event one elevator is closed for maintenance.
- C. In addition to their similar location within the stations, the elevators are intended to be as identical as possible throughout the System. This will aid their efficient procurement as described in the introduction to this

Section, 1.05.2., Vertical Circulation. It will also make it easier for the patrons to locate, recognize and use the elevators. Likewise, patrons with impaired eyesight will be benefited by identical design, placement and control of the System's elevators from one station to the next.

- D. Essentially, there are two different types of elevator operation within the new Metrorail Line Extensions: the elevator which travels totally within the "paid area" from concourse to platform, and the elevator which travels entirely within the "unpaid area".

There may be exceptions to these basic types which, if utilized, will be fully described within the Architectural Directive Drawings. The remainder of this section on elevators will confine its description to the two general types of elevator operation.

- E. Both the elevator cab and the elevator hoist way enclosure shall be constructed of glass to the maximum extent possible in order to enhance both the surveilability of this element and the patron's feeling of being observed. The surface of glass elevator doors shall be flush with their metallic frames.
- F. All instructional messages needed by the patron to call, operate, and communicate from the elevator cab and its enclosure to the station attendant's booth shall conform to the prevailing ADA criteria.

1.05.3.2 Elevator Type

All elevators contained with the System shall be commercial machine room-less, gearless traction type elevators. Hoistways should be designed to not preclude the use of elevators meeting APTA guidelines.

1.05.3.3 Elevator Capacity

Elevators shall have fully loaded capacities ranging from 2,500 to 4,000 pounds, depending upon the cab accommodation requirements.

1.05.3.4 Elevator Queuing Space

A patron queuing space 6 feet in length (measured from the face of the elevator enclosure doors) and as wide as the elevator enclosure, totally free of all vertical and horizontal obstructions, shall be provided at all elevator doors. Overlap of adjacent queuing space shall not occur.

1.05.3.5 Elevator Operation

A. Elevator Hoist way

- 1) There are four basic types of elevator hoist way enclosures within the System.
 - a) The hoist way enclosure located within the paid area of the center platform station will be open above the 8 foot level (at each landing) and shall be of the "flow through" type, containing two sets of center opening entrances opposite each other and perpendicular to the longitudinal axis of the station. In keeping with the effort to utilize elevators to their fullest extent, "flow through" design not only permits a wheelchair patron to avoid turning around to exit the cab, but also enables much faster loading and unloading of the elevator.
 - b) The hoist way enclosure located within the unpaid area of the side platform station will be enclosed throughout its height and shall contain two sets of center opening entrances, one each level. The ground level entrance shall be opposite the

concourse level entrance and both entrances will be parallel to the longitudinal axis of the station.

- c) The hoist way enclosure located within the paid area of the side platform station will be enclosed throughout its height and shall have a single center opening entrance.
 - d) The hoist way enclosure contained within the parking structure will be closed throughout its height and shall have one single slide entrance each level.
- 2) All elevator enclosures shall be equipped with call stations located immediately to the right of the elevator enclosure doors. The call stations shall consist of the following:
- a) An automatic push button which when depressed will summon the elevator to that level. The push buttons shall be flush stainless steel buttons, with a flush indicator light immediately above each, signaling its activation. Placement of call buttons shall be as prescribed in prevailing Codes.
 - b) Visible signal indications, placed within each call station, shall indicate whether the cab has arrived or is enroute, as well as the direction in which it is traveling.
 - c) Audible signal indications, placed within each call station, shall indicate the cab's arrival and direction.
 - d) A two-way intercom, from the station attendant's booth to the elevator enclosure, shall be placed within each call station. It shall be activated by a flush, stainless steel button which, when depressed, will signal the attendant that the patron would like to speak to him. It will not be necessary to hold this button down during the course of the conversation.

B. Elevator Cabs

- 1) There are three basic types of elevator cabs within the new Metrorail Line Extension.
 - a) The "flow through" cab utilizing two sets of center opening entrances opposite each other will be sized to accommodate an ambulance type stretcher, a wheelchair, or a large commercial floor scrubber.
 - b) The cab utilizing a single center opening entrance will be sized to accommodate an ambulance type stretcher or a large commercial floor scrubber, and permit the turning of a wheelchair.
 - c) The cab utilizing one single slide entrance, or two single slide entrances opposite each other, will be sized to accommodate an ambulance type stretcher as well as to permit the turning of a wheelchair.

- 2) All elevator cabs shall be equipped with control panels located immediately to the right of the cab doors. The control panels shall consist of the following:
 - a) Automatic push buttons which when depressed shall determine the elevator's destination. The push buttons shall be flush, stainless steel buttons, with flush indicator lights immediately adjacent to them signaling their activation. Heat activated buttons will not be permitted. Visible signal indicators, placed within the control panel, shall indicate whether the cab has arrived or are enroute, as well as the direction in which it is traveling. Configuration and placement shall be as prescribed in the prevailing Codes.

- b) Audible signal indicators, placed within each control panel, shall indicate the cab's arrival and direction at each level.
 - c) A two-way intercom, from the station attendant's booth to the elevator cab, shall be placed within each control panel. It shall be activated by a flush, stainless steel button, which when depressed, will signal the attendant that the patron would like to speak to him. It will not be necessary to hold this button down during the course of the conversation.
 - d) An emergency alarm button, placed within the control panel, shall when depressed, activate an audible and visible alarm both within the elevator cab and within the station attendant's booth.
 - e) The elevator cab control panel will also contain two key activated switches to be used by authorized personnel. These key operated switches shall turn the elevator ON and OFF and determine its direction of travel, respectively.
- 3) The elevator cab shall be equipped with a station public address speaker to insure that patrons riding in the elevator do not miss station announcements.
- 4) All elevator cabs shall be equipped with anti-creep devices designed to insure leveling accuracy to within 1/4 inch.
- 5) All elevator cabs shall remain at rest at the last landing served until summoned by the next patron or dispatched by the station attendant. Both elevator enclosure doors and elevator cab doors shall remain closed while the elevator is in its rest position.

- 6) In the event of a power failure, initially all cab and hoist way doors shall close and the cab shall remain at rest wherever it is. Emergency power shall be supplied which is sufficient to operate emergency lighting and emergency communications, and to return the cab down to the concourse. Cab and hoist way doors shall be operable from inside the cab. These criteria shall be refined as needed to meet detailed code requirements and interpretations, particularly those relating to power failure in event of fire.
- 7) All elevator cabs shall be equipped with fold-down seats and safety railings.
- 8) All elevator cabs shall be equipped with mat hooks to secure protective wall mats for maintenance and service use.
- 9) All elevator cabs shall be mechanically ventilated.

C. Elevator Doors

- 1) All elevator hoist way enclosure doors and elevator cab doors shall be either center opening or single slide, mechanically operated doors located as indicated on the Architectural General Plans and Directive Drawings.
- 2) All center opening doors shall have a minimum clear opening of 3 feet. All single slide doors shall have a minimum clear opening of 3 feet - 6 inches. All elevator doors shall be constructed of stainless steel.

- 3) All elevator doors shall be equipped with time delay mechanisms set for a minimum delay of seven seconds.
- 4) All elevator doors shall be equipped with photoelectric cells to prevent the doors from closing on patrons who are moving into or out of the elevator cab. These doors shall also be equipped with safety edge features as required by the American National Standard Safety Code ANSI A17.1.
- 5) The maximum door closing speed for all elevator doors shall be 80 feet per minute.

D. Station Attendant Operational Capability

- 1) The station attendant's booth shall be equipped with elevator controls which will enable the attendant to position the elevator cab at any given floor and to control the opening and closing of the elevator doors. These controls shall override all patron activated controls.
- 2) Normally, the two basic types of elevators, although equipped to operate exclusively under station attendant control if either the specific station operating policy dictates or the patron requires elevator operation assistance, shall be operated as follows:
 - a) "Unpaid area" elevator: entering patrons entering the station via the elevator shall be required to request that the elevator doors be opened by the station attendant. These doors shall remain closed until the patron summoning the elevator to the lower level has been identified by the station attendant via his closed circuit television capability and/or his two-way intercom.

- b) "Unpaid area" elevator: exiting patrons exiting the station via the elevator shall not be required to seek elevator operation assistance from the station attendant. The elevator controls shall allow exclusive operation of the elevator by the patron.
 - c) "Paid area" elevator patrons traveling from the station concourse to the station platform or from the station platform to the station concourse via the elevator shall not be required to seek elevator operation assistance from the station attendant. The elevator controls shall allow exclusive operation of the elevator by the patron.
 - d) Parking structure elevator patrons traveling from level to level of the parking structure shall not be required to seek elevator operation assistance from the station attendant. The elevator controls shall allow exclusive operation of the elevator by the patron.
- 3) The station attendant's booth shall be equipped with an elevator enunciator panel located adjacent to the elevator control panel. The enunciator panel shall indicate the following:
- a) The location and travel direction of each elevator cab.
 - b) The functional status of each elevator; whether it is malfunctioning or stopped due to malfunction.
 - c) The status of the emergency alarm button in each elevator, with both visual and audible indicators.
 - d) The status of the fire and smoke detectors in each elevator hoist way and machine room.
 - e) The occupancy status of the elevator as conveyed by the detector located in the hydraulic fluid line of the elevator.

- 4) The station attendant's booth shall be equipped with a two-way intercom placed adjacent to the elevator control panel enabling him to speak to patrons at the elevator landing and within elevator cab.

1.05.3.6 Elevator Landing Shelter

- A. All of the "paid area" elevator landings, as well as the upper landing of the "unpaid area" elevators are within the station structure and, thus protected from the rain. However, the lower landing (at-grade) of the "unpaid area" elevator may be outside the basic station structure and require a special canopy, integrated into the elevator hoist way enclosure, as indicated on the Architectural Directive Drawings.
- B. The sheltered waiting area shall be equal in size to the typical elevator queuing space as described under Section 1.05.3.5 of these criteria.
- C. The sheltered waiting area shall be fully open to its surroundings and easily observable. In addition, this area shall be observed by closed circuit television monitored at the station attendant's booth.
- D. The sheltered waiting area shall pitch down and away from the elevator hoist way enclosure at a slope of one percent.

1.05.3.7 Elevator Hoist Way

The elevator hoist way shall be located and sized as indicated on the Architectural Directive Drawings and as required by the prevailing Codes.

1.05.3.8 Elevator Controls

The elevator controls shall be located and sized as indicated by best industry practice and prevailing Codes.

1.05.3.9 Elevator Utilization For Maintenance

In addition to providing a means of vertical circulation for station patrons, the elevator shall be the primary means of vertical movement for station maintenance and servicing operations. This includes the movement of floor scrubbing machines, fare collection money carts, etc.

1.05.4 STATION STAIRS

1.05.4.1 General

The number, size and placement of station stairs normally utilized by patrons shall be as shown on the Architectural Directive Drawings. Station stairs shall be direct and uninterrupted; return stairs shall be permitted only in the event that straight run stairs are precluded while circular and winding stairs shall not be permitted. Stairs between station concourse and platform levels shall be designed in conformance with the Architectural Directive Drawings.

1.05.4.2 Station Stair Width

All station stairs shall be 66 inches wide unless otherwise indicated. This width shall provide three 22 inch lanes of exiting capacity.

1.05.4.3 Station Stair Treads and Risers

- A. Station stair trends and risers shall be proportioned as prescribed by the prevailing codes. However, proportions approaching 6.5" rise and 11" tread are more comfortable for the average person and are encouraged.

- B. All riser dimensions and all tread dimensions shall be uniform throughout any one stair.
- C. All treads shall be constructed of slip resistant materials with a minimum coefficient of friction of 0.6.
- D. Refer to the prevailing codes for the minimum and maximum number of risers.
- E. The number of runs in any one stair shall not exceed three.

1.05.4.4 Station Stair Nosings

The stair nosings shall round into a sloped, solid riser, which rounds into the next tread. The maximum allowable riser slope shall be 1-1/2 inches.

1.05.4.5 Station Stair Landings

The minimum depth of each stair landing shall be as prescribed by the prevailing codes.

1.05.4.6 Station Stair Handrails

- A. Station stair handrails shall be round stainless steel members securely mounted as prescribed by code.
- B. Station stair handrails shall be mounted on both sides of all stairs and shall be continuous through all landings for the full length of each stair.

1.05.4.7 Station Stair Headroom

The headroom above all stairs shall be 9 feet - 6 inches minimum measured vertically from a line coplanar with the stair nosings.

1.05.4.8 Station Stair Capacity

Station stairs shall have a patron capacity in the up direction of 35 people per minute per 22 inches per lane of exiting width. The patron capacity in the down direction shall be 40 people per minute per 22 inches per lane of exiting width.

1.05.4.9 Station Stair Queuing Space

A patron queuing space 20 feet long (measured from the line of the first riser) and 6'-0" wide, totally free of all vertical or horizontal obstructions, shall be provided at both the upper and lower landings of all stairs. Overlap of adjacent queuing space shall not be permitted.

1.05.4.10 Station Stair Lighting

As indicated within the Lighting Criteria, Section 4.07 of the Electrical Design Criteria, all stair landings shall be provided with a level of illumination intended to increase the safety of patrons utilizing the stairs. I.e. minimum code requirements should be exceeded.

1.05.4.11 Station Stair Maintenance

Station stairs shall be designed and constructed to be as self-draining as possible. Each tread and landing shall pitch down one percent toward the edge of the riser.

1.05.4.12 Station Stair Fire Resistance

Station stairs shall be totally constructed of noncombustible materials.

1.05.5 PARKING STRUCTURE STAIRS

1.05.5.1 General

Stairs shall be direct or return type. Circular and winding stairs shall not be used.

1.05.5.2 Parking Structure Stair Width

Parking structure stairs shall conform to the prevailing Florida Building Code.

1.05.5.3 Parking Structure Stair Treads and Risers

- A. Stair risers shall be proportioned according to the prevailing codes.

- B. Riser dimensions and all tread dimensions shall be uniform throughout any one stair.

- C. Treads shall be constructed of slip resistant materials.

- D. The number of runs in any one stair shall not exceed two.

1.05.5.4 Parking Structure Stair Nosings

The stair nosings shall round into a sloped, solid riser, which rounds into the next tread, the maximum allowable riser slope being 1-1/2 inches.

1.05.5.5 Parking Structure Stair Handrails

- A. All stair handrails shall be round stainless steel and proportional as prescribed by code.

- B. Stair handrails shall be mounted on both sides of all stairs and shall be continuous through all landings for the full length of each stair.

1.05.5.6 Parking Structure Stair Headroom

The headroom above all stairs shall be 9 feet measured vertically from a line coplanar with the stair nosings.

1.05.5.7 Parking Structure Stair Capacity

All stairs shall have a patron capacity in the up direction of 35 people per minute per 22 inches per lane of exiting width. The patron capacity in the down direction shall be 40 people per minute per 22 inches per lane of exiting width.

1.05.5.8 Parking Structure Stair Queuing Space

A patron queuing space 5 feet long (measured from the line of the stair door) and 3 feet - 8 inches wide, totally free of all vertical or horizontal obstructions, shall be provided at both the upper and lower landings of all stairs. Overlap of adjacent queuing space shall not be permitted.

1.05.5.9 Parking Structure Stair Lighting

As indicated within the Lighting Criteria, Section 4.07 of the Electrical Design Criteria, all stair landings shall be provided with a level of illumination intended to increase the safety of patrons utilizing the stairs.

1.05.5.10 Parking Structure Stair Maintenance

All stairs shall be designed and constructed to be as self-draining as possible. Each tread and landing shall pitch down one percent toward the edge of the riser.

1.05.5.11 Parking Structure Stair Fire Resistance

All stairs shall be totally constructed of noncombustible materials.

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1.06 STATION ATTENDANTS BOOTH

(Station Attendant Booth Requirements to be discussed with MDT)

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1.07 STATION ANCILLARY SPACES

1.07.1 GENERAL

- A. Design policy pertaining to station ancillary spaces shall follow the provisions of criteria described herein to insure continuity of configuration, standardized room layout and efficiency of service operations on a systemwide basis.

- B. The technical aspects of station ancillary services described are also in detail by applicable Mechanical and Electrical Station Design Criteria contained in Volume II, Chapters 4 and 5.

1.07.2 ANCILLARY SPACE CONFIGURATION

1.07.2.1 General

- A. The relationship of ancillary spaces to one another and to the public areas of each station is basic to the architectural concepts outlined in the Standard and Directive Drawings and shall be subject to the practical consideration of engineering and systemwide equipment criteria.

- B. The placement and arrangement of station related mechanical and electrical equipment within designated ancillary spaces shall consider the following general requirements:
 - 1) All such equipment must be readily accessible and capable of frequent inspection and maintenance as required.
 - 2) Equipment installation must not preclude replacement by more advanced systems, or development of such new services within stations as become practical due to advances in transit technology.

- C. In addition, servicing of ancillary space equipment shall be facilitated by standardization of both equipment and equipment layout so that the

following concepts shall apply to the planning of all station ancillary spaces on a systemwide basis.

1.07.2.2 Location

- A. The ancillary spaces shall typically occur at grade for all stations of the System unless otherwise indicated by the General Plan Drawings.
- B. Typical center platform stations with at grade concourse configurations shall be provided with ancillary spaces located at one end of the paid concourse area below the station and guideway structure.
- C. Typical side platform stations with aerial concourse configurations shall be provided with ancillary spaces located at grade level and integrated with the general support structure of the elevated concourse above.
- D. Ancillary space location shall consider site specific development and shall be sensitive to pedestrian access ways leading to the concourse entrance.

1.07.2.3 Ancillary Space Size and General Layout

- A. The overall size and general room arrangement for ancillary spaces may vary according to site specific conditions and right of way constraints and shall be dependent upon the following station configurations: (Refer to Section 1.04 of the Architectural Design Criteria dealing with station configuration).
 - 1) Center platform with at grade concourse
 - 2) Center platform with aerial concourse
 - 3) Center platform terminal station
 - 4) Side platform with aerial concourse

5) Side platform terminal station

- B. Typical ancillary space room arrangements for standard center and side platform stations are defined in the Architectural Directive Drawings.

1.07.2.4 Construction

Ancillary space structures not exceeding one story in height shall be constructed of concrete or masonry configured to provide a minimum two hour fire rating in conformance with the requirements of the Florida Building Code, Type I Fire Resistive Construction.

1.07.2.5 Access Control

- A. Ancillary space access doors shall be provided with appropriate security and intrusion controls and panic hardware conforming to the requirements established in the Systemwide Security Criteria, Volume I, Chapter 8 and the Supervisory Control Section of the Electrical Design Criteria contained in Chapter 4.
- B. In those areas where visual surveillance of access doors is required but cannot be directly maintained from the station attendant's booth, CCTV surveillance equipment shall be provided in a manner which is compatible with station design.
- C. Openings in fire rated separations shall be in accordance with the requirements of the Florida Building Code.

1.07.2.6 Service

- A. Equipment located in ancillary spaces for all transit stations is generally restricted to mechanical and modular electrical components.

- B. Access doors to ancillary spaces shall be sized to permit direct servicing, repair, and removal of such equipment if required and shall maintain a minimum width of three feet.

1.07.2.7 Fire Protection

Fire protection and fire safety equipment requirements for specific ancillary space room assignments shall be in conformance with Volume I - Systemwide Criteria, Chapter 9 Fire/Life Safety Criteria and the Florida Building Code.

1.07.3 SERVICE SPACES

1.07.3.1 General

- A. Ancillary service spaces shall include but not be limited to custodial rooms, trash rooms, toilet rooms and adjacent access corridors.
- B. The width of corridors accommodating service functions shall be 4 feet clear, minimum.

1.07.3.2 Custodial Rooms

- A. Purpose: Custodial rooms shall accommodate storage space and utilities necessary for daily, periodic and long term maintenance of stations.
- B. Number and Location: At least one custodial room shall be provided at each station located so as to provide convenient access to the station concourse, or to an elevator leading to the station concourse.
- C. Size: Where possible, custodial rooms shall have the following minimum dimensions.

- 1) Area: 48 square feet
 - 2) Width: 4 feet 8 inches
 - 3) Length: 10 feet 8 inches
 - 4) Height: 8 feet 8 inches
 - 5) Door Size: Single door 3 feet wide by 7 feet high
- D. Equipment: Each custodial room shall be designed to accommodate the following equipment.
- 1) Mop sink with cold water supply.
 - 2) Floor scrubbing machine
 - 3) Floor brooms (2) and floor mops (2)
 - 4) Double floor mop bucket with wringer
 - 5) Stepladder - 8 feet high (typical for relamping purposes)
 - 6) Shelving for storage of cleaning and toilet supplies
 - 7) Wall mounted tool holding clips, cam action, for storage of brooms, mops, shovels and miscellaneous repair tools.
 - 8) Automatic fire protection (as required). (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)
 - 9) A minimum of one weatherproof duplex electric convenience outlet.
 - 10) General illumination fixtures and controls
 - 11) Floor drain
 - 12) Ventilation (as required, refer to Volume I, Chapter 9 of the Fire/Life Safety criteria).
- E. Illumination: Surface mounted lighting fixtures will be installed, as necessary, to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.

1.07.3.3 Trash Rooms

- A. Purpose: Trash rooms shall house facilities for short term storage and servicing of refuse removed from the station by daily maintenance procedures.

- B. Number and Location: One trash room shall be provided in each station directly adjacent to an internal service corridor which exits to an outside area serviced by maintenance vehicles.

- C. Size: Where possible, trash rooms shall have the following minimum dimensions.
 - 1) Area: 100 square feet
 - 2) Width: 10 feet 2 inches
 - 3) Length: 10 feet 8 inches
 - 4) Height: 8 feet 8 inches
 - 5) Door Size: Single door 3 feet wide by 7 feet high

- D. Equipment: Trash rooms shall accommodate the following equipment.
 - 1) Automatic fire protection as required. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)
 - 2) Ventilation as required. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)
 - 3) Cold water hose bib, three feet above the floor located near the entry door
 - 4) Floor drain located in the center of the floor
 - 5) One weatherproof electric convenience outlet
 - 6) Trash compacting equipment.

- E. Illumination: Surface mounted lighting fixtures will be installed as necessary to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.

1.07.3.4 Toilet Room

- A. Purpose: At each station, provisions will be made for the use of toilet facilities by authorized transit personnel. Public use of toilet facilities shall be possible through the station attendant only upon request or in emergencies subject to the security level controls established in Section 8.01 of the Systemwide Criteria dealing with Systemwide Design.
- B. Number and Location: One toilet room shall be provided at each station with an access door which opens directly into the paid area of the concourse. For public access as described above. One toilet room shall be located with private access for MDT personnel only.
- C. Size: Toilet Rooms shall be designed in accordance with the latest edition of the Florida Building Code.
- D. Equipment: Toilet rooms shall accommodate the following equipment and fixtures.
 - 1) One water closet
 - 2) Coin operated tampon sanitary napkin dispenser and disposal unit
 - 3) One lavatory with cold water supply
 - 4) Soap dispenser and shelf
 - 5) Paper towel dispenser
 - 6) Mirror
 - 7) Waste receptacle

- 8) Coat and purse hooks, as necessary
 - 9) Floor drain
 - 10) Lighting fixtures and controls
 - 11) Ventilation as required
 - 12) One duplex electric convenience outlet
 - 13) Wall mounted assist supports Per Florida Building Code.
 - 14) Toilet tissue dispenser
 - 15) Automatic fire protection (Refer to Vol. I Chapter 9 of the Fire/Life Safety criteria)
- E. Illumination: Toilet rooms shall have ceiling recessed lighting fixtures installed, as necessary, to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.
- F. Access Control: Toilet room doors shall be provided with an electronic lock system and intrusion detectors controlled by the station attendant from the station attendant's booth. An indicator light shall be used to signal room occupancy. Station personnel shall have access to toilet rooms by key operation.

1.07.4 EQUIPMENT SPACES

1.07.4.1 General

- A. Ancillary equipment spaces include mechanical and electrical equipment rooms, emergency equipment cabinets and areas for electrical and telephone panels.

- B. The location, configuration, and layout for all equipment spaces shall be in conformance with the Standard and Directive Drawings and related criteria sections.
- C. The width of corridors accommodating equipment spaces shall be 4 feet clear minimum.

1.07.4.2 Mechanical Equipment Rooms

- A. Purpose: Mechanical equipment rooms shall accommodate equipment and controls associated with the mechanical service functions of transit stations.
- B. Number and Location: One mechanical equipment room shall be provided at each station located to provide direct access to an outside unpaid area of the station which may be serviced by maintenance vehicles.
- C. Size: Where possible, mechanical equipment rooms shall have the following minimum dimensions:
 - 1) Area: 510 square feet
 - 2) Width: 26 feet 8 inches
 - 3) Length: 19 feet
 - 4) Height: 10 feet 8 inches
 - 5) Door Size: Single door 4 feet wide by 7 feet high with a fixed panel 4 feet wide by 2 feet 8 inches high
- D. Equipment: Mechanical equipment rooms shall be in conformance with the equipment layout indicated in applicable Mechanical Standard

Drawings and Mechanical Design Criteria contained in Volume II, Chapter 5 of the Station Design Criteria. Mechanical equipment shall include the following:

- 1) Supply fan for the electrical equipment room
- 2) Sewage ejector and compressor
- 3) Automatic fire protection as required. (Refer to Vol. I, Chapter 9 of the Fire/Life Safety criteria.)
- 4) Compressor and air handling unit for the train control and communications room
- 5) Motor control center
- 6) Ladder to roof access hatch
- 7) Ventilation as required. (Refer to Vol. I, Chapter 9 of the Fire/Life Safety criteria.)

E. Illumination: Lighting fixtures will be installed as necessary to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria

F. Associated Secondary Spaces: Each station shall be provided with a separate elevator machine room containing mechanical pump units and controllers necessary for the operation of oil hydraulic elevators, and shall comply with the provisions of the Florida Building Code.

1.07.4.3 Electrical Equipment Room

A. Purpose: Electrical equipment rooms shall house electrical power equipment and controls required for the mechanical and electrical service functions at each station.

- B. Number and Location: One electrical equipment room shall be provided at each station located to provide direct access to an outside area of the station which may be serviced by maintenance vehicles.
- C. Size: Where possible, electrical equipment rooms shall have the following minimum dimensions:
- 1) Area: 780 square feet
 - 2) Width: 26 feet 8 inches
 - 3) Length: 29 feet
 - 4) Height: 10 feet 8 inches
 - 5) Door Size: Two sets of double doors
 - a) 9 feet 4 inches wide by 7 feet high
 - b) 8 feet wide by 7 feet high. Both doors have fixed panels 2 feet 8 inches high
- D. Electrical equipment rooms shall be in conformance with the equipment layout indicated in applicable Electrical Standard Drawings and Electrical Design Criteria contained in Volume II, Chapter 4 of the Station Design Criteria. Electrical equipment shall include the following:
- 1) Unit substations (2)
 - 2) Automatic transfer switches (3)
 - 3) Individually mounted circuit breakers (2)
 - 4) Panel boards as required
 - 5) SCITC cabinets
 - 6) Dry type transformers (2)
 - 7) Ventilation as required. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)
 - 8) Automatic fire protection as required. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)

- E. Illumination: Lighting fixtures will be installed as necessary to provide general illumination levels as specified in Section 4.07. of the Electrical Design Criteria dealing with Lighting Design Criteria.

- F. Associated Secondary Spaces: Each station shall be provided with a secondary ancillary space electrical room and a separate electrical closet to house electrical and telephone distribution panels and emergency battery packs. All secondary electrical spaces shall be two hour fire rated in conformance with the requirements of the Florida Building Code, Type I Fire Resistive Construction. These rooms shall be designed according to the dimensional layouts indicated in the Directive and Standard Drawings and shall comply with applicable Electrical Design Criteria contained in Volume II, Chapter 4 of the Station Design Criteria.

1.07.4.4 Emergency Equipment Cabinet

- A. Purpose: Emergency equipment cabinets shall contain all necessary emergency equipment.

- B. Number and Location: One emergency equipment cabinet shall be provided at each station ancillary facility located adjacent to the main ancillary service entry door and directly accessible from the paid area of the station concourse.

- C. Size: Where possible, emergency equipment cabinets shall have the following minimum dimensions:
 - 1) Area: 15 square feet
 - 2) Width: 3 feet 4 inches

- 3) Length: 4 feet 8 inches
- 4) Height: 8 feet 8 inches clear
- 5) Door Size: Single door 3 feet wide by 7 feet high

D. Equipment: Each emergency equipment cabinet shall accommodate the following equipment:

- 1) Wall mounted stretchers (2)
- 2) First aid kit
- 3) Wall mounted axe
- 4) Portable battery hand lamps (2)

E. Illumination: Lighting fixtures will be installed and interlocked with the door for automatic switch on to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria

1.07.5 TRANSIT OPERATION SPACES

- A. Transit operation spaces include train control and communication rooms, battery rooms, maintenance rooms, revenue rooms, and supplementary transit operation spaces which occur at terminal stations including train operators room.
- B. The location, configuration and layout for all transit operation spaces shall be in conformance with the Standard and Directive Drawings and related criteria sections.
- C. The width of corridors accommodating transit operation spaces shall be designed to provide a minimum clear dimension of 4 feet.

- D. Equipment: Train control and communications rooms shall be in conformance with the equipment layout indicated in applicable Electrical Directive and Standard Drawings and criteria.
- E. Illumination: Lighting fixtures will be installed as necessary to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.
- F. Ventilation: Train control and communications rooms shall be environmentally controlled for temperature and humidity and shall comply with the mechanical ventilation requirements contained in Volume II, Chapter 4 of the Station Design Criteria, and Volume I, Chapter 9 of the Systemwide Criteria.
- G. Access: No access to or through the train control communications room shall be permitted to service or transport any equipment not installed in the train control and communications room.
- H. Associated Secondary Spaces.
 - 1) A battery room shall be provided at each station to house emergency standby power for the train control and communications equipment. Battery rooms shall be enclosed in two hour fire rated construction in conformance with the requirements of the Florida Building Code Type I, Fire Resistive Construction. Access shall be provided from the train control and communications room only.
 - 2) Battery rooms shall be provided with an emergency eyewash station and floor drain and shall be mechanically ventilated to the

outside to preclude the accumulation of unsafe concentrations of hazardous gases.

- 3) Battery rooms shall be designed according to the dimensional layouts indicated in the Directive and Standard Drawings and shall comply with applicable Electrical Design Criteria contained in Volume II, Chapter 4 of the Station Design Criteria.

1.07.5.2 Maintenance Room

- A. Purpose: Maintenance rooms shall provide space for maintenance, testing and storage equipment related to the servicing and repair of station facilities.
- B. Number and Location: One maintenance room shall be provided at each station located adjacent to the central ancillary service corridor.
- C. Size: Where possible, maintenance rooms shall have the following minimum dimensions:
 - 1) Area: 100 square feet
 - 2) Width: 10 feet 8 inches
 - 3) Length: 11 feet 4 inches
 - 4) Height: 10 feet 8 inches
 - 5) Door Size: Single door 3 feet wide by 7 feet high
- D. Equipment: Each maintenance room shall be designed to accommodate the following equipment:
 - 1) Work bench
 - 2) Test bench with shelf storage
 - 3) Storage cabinets for large tools

- 4) Storage bins for miscellaneous parts and equipment
- 5) Lockable equipment lockers for storage of testing equipment
- 6) Personnel clothes lockers
- 7) Lighting fixtures and controls
- 8) Ventilation as required. (Refer to Volume I, Chapter 9 of the Fire and Life Safety Criteria.)
- 9) Electrical convenience outlets as required
- 10) Telephone
- 11) Floor drain
- 12) Automatic fire protection as required. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)

E. Illumination: Lighting fixtures will be installed as necessary to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.

1.07.5.3 Revenue Room

- A. Purpose: Revenue room shall provide space for the storage and collection of transit revenue and fare media related to the fare collection operation at each station.
- B. Number and Location: One revenue room shall be provided at each station located adjacent to the central service corridor with convenient access to outside service areas of the station.
- C. Size: Where possible, the revenue room shall have the following minimum dimensions:
 - 1) Area: 100 square feet
 - 2) Width: 10 feet 4 inches

- 3) Length: 10 feet 8 inches
- 4) Height: 8 feet 8 inches
- 5) Door Size: Single door 3 feet wide by 7 feet high

D. Equipment: Revenue rooms shall be designed to accommodate the following equipment:

- 1) Vault
- 2) Fare collection carts
- 3) Money sorters
- 4) Lockable storage cabinets
- 5) Ventilation as required

E. Illumination: Lighting fixtures will be installed as necessary to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.

1.07.5.4 Train Operators Room

- A. Purpose: Train operators rooms shall provide space for transit operations personnel during train layovers and lunch periods.
- B. Number and Location: One train operator's room shall be provided at terminal stations only, and shall be located to provide direct access to outside service areas of the station.
- C. Size: Where possible, the train operator's room shall have the following minimum dimensions:
 - 1) Area: 310 square feet
 - 2) Width: 12 feet
 - 3) Length: 26 feet 8 inches

- 4) Height: 8 feet 8 inches
- 5) Door Size: Single door 4 feet wide by 7 feet high with a fixed panel 4 feet wide by 2 feet 8 inches high

D. Equipment: The trainmen's room shall be designed to accommodate the following equipment:

- 1) Vending machines
- 2) Tables and chairs
- 3) Drinking fountain
- 4) Utility Sink
- 5) Personnel lockers
- 6) Ventilation and air conditioning. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)
- 7) Portable fire extinguisher. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)
- 8) Automatic fire protection as required. (Refer to Volume I, Chapter 9 of the Fire/Life Safety criteria.)

E. Illumination: Trainmen's rooms shall have ceiling recessed lighting fixtures installed, as necessary, to provide general illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.

1.07.5.5 Operations Supervisor's Booth

- A. Purpose: Operation supervisors' booths shall be designed to accommodate equipment and controls necessary for the coordination and movement of trains and personnel to ensure smooth terminal operations.

- B. Number and Location: One operation supervisor's booth shall be provided at each terminal station and shall be located at the end of the train boarding platform to afford a complete view of the arrival and departure of trains.
- C. Size: Operations supervisors' booths shall have the following minimum dimensions:
- 1) Area: 40 square feet
 - 2) Width: 5 feet
 - 3) Length: 8 feet
 - 4) Height: 7 feet clear (interior dimension)
 - 5) Door Size: Single door 2 feet 4 inches wide by 6 feet 8 inches high.
- D. Equipment: Operations supervisors' booths shall be designed to accommodate the following equipment:
- 1) Countertop and shelves
 - 2) PABX telephone
 - 3) Public address controls and equipment
 - 4) Electric clock
 - 5) Lighting fixtures and controls
 - 6) HVAC equipment as required
 - 7) One duplex electric convenience outlet (120 volts)
 - 8) Storage unit
 - 9) Portable fire extinguisher
- E. Illumination: Recessed lighting fixtures will be installed and integrated with the general design of the booth to provide general

illumination levels as specified in Section 4.07 of the Electrical Design Criteria dealing with Lighting Design Criteria.

- F. Construction: The booth shall be designed to allow for booth relocation in the event of future line extensions. See related Standard Drawings for booth design and configuration.

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1.09 MATERIALS AND FINISHES

1.09.1 INTRODUCTION

- A. One of the main contributing factors to the public's perception of the rapid transit system is the appropriate use of materials and finishes. It will be the materials and finishes that clarify and enhance the architectural expression of the structure, spatial features, circulation elements and station equipment. At the same time, it is important that the materials and finishes have an intrinsic visual richness of their own that instills in the viewer a sense of pride in the public use facility. It is equally important that they maintain their good appearance for their expected lifetime, given a reasonable amount of maintenance. The materials and finishes must be able to accept the type of continuous and excessive heavy use that a public facility must endure while maintaining its original intent.
- B. The stations will be in the public eye most frequently. They will be seen close up and their surfaces will be both touchable and walk able. The line sections also have massive visual impact. Though the line sections need not be finely detailed or finished, great care must be taken to assure that highway drivers, street pedestrians, and nearby home-dwellers see a unified, attractive transportation structure.

To this end, materials and finishes in the line sections must harmonize with those at stations, with minimum expenditure of money. Portions of guideways within the stations and in visually critical areas must be especially finished such as sandblasting guideway piers which are in the station areas. For this reason, Volume II, Station Design Criteria, takes note of line section design and coordination in station areas.

- C. The selection of construction materials will reflect the functioning of transit stations as spaces which are subject to heavy pedestrian traffic. Material characteristics will serve to enhance the transition from one area of the station to another and will provide surfaces that minimize confusion and the possibility of accidents.

- D. Given the likelihood that some abuse will occur, that there may be lapses in maintenance, and that appurtenances of this type are generally not marketed to last 50 years, several other criteria are desirable:
 - 1. Materials should age gracefully (as some masonry materials do) rather than become shabby (as some plastics and metal finishes do).
 - 2. Random joints shall be minimized.
 - 3. Field applied finishes and finishes which require reapplication shall be avoided.

- E. Safety, durability, maintainability, ease of replacement, appearance and compatibility with the outdoor character of the system are among the basic concepts that will govern the selection of construction materials.

- F. Concrete will be the most widely used construction material and, therefore, will be the most important construction product. Both cast-in-place and factory precast concrete will be utilized in the work, with special preference given to the use of factory precast concrete construction as required to assure best quality control and cost savings.

- G. Visible architectural surface finishes may generally be considered those involved in the floors, walls and ceilings of the various station designs. In addition, those surfaces of ancillary facilities and guideway structures

which are visible to public view are also to be considered as architectural surface finishes.

- H. The architectural material installations will reflect the desired design function, to be expressed either as a systemwide element or as an element of variable design. Those material installations which contribute to transit system recognition and unity are defined as systemwide elements. Material installations which primarily address themselves to the unique character of the individual station sites are defined as elements of variable design.

1.09.2 MATERIAL AND FINISH SELECTION POLICY

- A. This section establishes the criteria for the selection of materials and finishes. Given the nature of a public transit system, it is important to realize that each criterion must be met to the greatest degree possible. Criteria for the materials and finishes are the result of a number of objectives and goals that must be met in relation to each other. No one criterion can be singled out at the expense of all others and still achieve a suitable result. As with all aspects of the system, the materials and finishes are to be optimized conclusions consistent with systemwide objectives and goals.
- B. The listing of various acceptable materials and finishes in this section is not intended to limit the creativity of the Final Designer. However, prudent evaluation and judgment must be exercised in considering materials and finishes other than those listed if a systematic totality is to be achieved. The Final Designer is charged with the responsibility of selecting materials and finishes in accordance with the criteria established in this section.

1.09.3 GENERAL REQUIREMENTS

A. Appearance

- 1) The materials and finishes must have qualities which create feelings of warmth, attractiveness and quality which will instill civic pride in the transit facility.
- 2) The selected color range should favor materials which are predominantly medium to light in tone to aid in attaining desired illumination levels, but with sufficient contrast and accents to provide visual interest and to conceal minor soiling.
- 3) Glare shall be considered in selecting all materials.
- 4) Materials and details that will not collect dirt or wash down dirt or dissolved salts upon other materials are desirable.

B. Safety

- 1) The structural envelope of all public station areas must be constructed of noncombustible materials.
- 2) The structural envelope of all ancillary spaces, equipment and station appurtenances must be constructed of fire resistant materials.
- 3) Materials that emit dense smoke or toxic fumes while smoldering or burning, such that the health and safety of station occupants may be endangered, are prohibited from use within the transit station. Generally, use materials with a flame spread of less than 25 (ASTM E84), except that in open, nonpublic and non-critical areas a flame spread of 25-75 is permissible.
- 4) Hazards from dislodgement due to temperature change, vibration, wind, aging or other causes must be eliminated by using proper attachments and adequate bond strengths.

- 5) Floor materials with a minimum 0.6 coefficient of friction will be used throughout the transit facility to increase patron safety with special consideration given to such locations as entrances, stairways, platform edge strips and areas around equipment.
- 6) Materials that have, or can develop, sharp edges, splinters, burrs, or other dangerous surfaces shall be avoided.

C. Weatherability

- 1) The public areas in the transit system will, for all practical purposes, be considered outdoor space and as such must be constructed of materials and finishes which are normally deemed suitable for exterior use.
- 2) All materials and finishes shall have a high degree of weatherability and resistance to moisture, corrosion, deterioration and fading.

D. Durability

- 1) Only those materials and finishes which maintain their appearance throughout their lifespan under conditions of constant public use will be selected.
- 2) Surfaces must be resistant to accidental abuse, including severe abrasion, marring, impact and indentation. Surfaces within the reach of the public (up to eight feet above the floor) must be more resistant to damage than is necessary for those above that point.
- 3) Materials and finishes must be acid and alkali resistant, hard, dense and nonporous to resist staining, soiling, marking, spray painting and chemical defacement or deterioration caused by vomit, urine, greasy foods, and cleaning agents.

- 4) Vandalism must be discouraged by selecting and detailing the materials and finishes so that they are difficult to deface, damage or remove, and so that they do not invite such abuse.
- 5) Joints should be small, flush, and limited in number and composed of highly durable materials.
- 6) Materials that require trim shall be avoided.
- 7) Monolithic materials may be used if they have inherent soil hiding characteristics. Monolithic materials need adequate control and expansion joints at the proper spacing to prevent surface cracking.
- 8) Edges shall be of profiles that do not easily dent or chip, and which do not invite denting or chipping.

E. Maintainability

- 1) The basic inherent quality of all materials and finishes selected must be such that minor soiling is not apparent.
- 2) Smooth or lightly textured surfaces are preferred over rough or deeply textured ones because they are less prone to catch dust, collect mold/mildew, and are easily cleaned.
- 3) Dust catching ledges shall be avoided. Drain dust-catching pockets and surfaces in such a way that rain streaking will not occur.
- 4) The materials and finishes must be easily cleanable in a single operation with standard equipment and standard cleaning agents.
- 5) Where absorptive materials are used, the application of inconspicuous sealers that will hold out stains is encouraged.

F. Heat Control

- 1) Use insulating materials that do not degrade or lose their insulating value with moisture absorption (e.g. foamed glass).

- 2) Do not expose insulation where items may be fastened to it, where traffic damage can occur, or where the public will see it.
- 3) Insulation shall be non-flammable and nonsmoking.
- 4) White surfaces are appropriate for roofs. Roofs which are exposed to close public view shall be colored and given texture to reduce glare.

G. Repair and Replacement Ease

- 1) It will be necessary to select materials and finishes which, if damaged, can be repaired or replaced without undue interference with the operation of the system.
- 2) Monolithic materials must have the ability to accept repair without the repair being noticeable.
- 3) In general, the optimum unit size of the materials and finishes must be small enough to facilitate replacement if severely damaged.
- 4) For replacement purposes, materials with a factory finish are preferred to materials requiring field finishing maintaining maximum continuity in material finish.
- 5) Consideration must be given to the continued availability of the materials and finishes both during and after construction of one or more stations. Avoid materials in which patching will not blend inconspicuously with the base material.

H. Design Modules

- 1) The primary modules by which the system has been conceived are as follows:
 - Large module: 8 feet, expressed sometimes, where necessary, as a 4 foot fractional module, or as a 16 foot multiple.

- Small module: 8 inches, expressed sometimes, where necessary, as a 4 inch fractional module, or as a 16 or 24 inch multiple.

Exception: Joints in exterior paving will be kept at the 4 or 8 foot spacing customary with the industry. Line up joints with structural features where possible, to maintain an orderly pattern.

I. Material Continuity

In the choice of basic materials and in selecting variations in materials for specific locations, materials of continuity will be:

- 1) Cost, availability and suitability to local climate and building tradition make concrete the basic material for the visible system.
- 2) Unpainted concrete is suitable systemwide because the locally provided concrete is typically whiter and more uniform in color than concrete in most areas of the U.S. The highly articulated character of the system design is one that is appropriately executed in unadorned concrete. If details are worked out to minimize water staining, unpainted surfaces will prove cheaper to maintain, even if the initial cost of good concrete work is slightly higher than poor, but painted concrete.
- 3) Natural earth-born materials such as concrete, stone, gravel, and plants will be used for major elements of the system in preference to metal, glass, plastics and coatings which may be used selectively. Clay, concrete, and asphalt are desirable in horizontal applications.
- 4) Wood, though desirable as an inexpensive, natural material, is generally unsuitable to low maintenance, low replacement, cost constraints of this system. Wood will be used in limited quantities

only where its qualities of lightness, fabricability, warmth, comfort and pleasing appearance outweigh its natural limitations. In such cases, proper steps shall be taken to make the wood long lasting and maintainable.

- 5) Where transparency is desirable for safety, security and selective day lighting, clear materials will be used.
- 6) In selecting metals, stainless steel with its light gray, smooth, mild luster shall be the favored material. It shall be provided in a corrosion-resistant alloy such as AISI Type 316 or 444.
- 7) Where use of a dark metal finish of moderate corrosion-resistance is justified, integral color anodized aluminum or fluoropolymer-coated aluminum in dark bronze or black could be considered.
- 8) Where the use of carbon steel cannot be avoided, it shall be heavily zinc coated and painted to simulate the color of stainless steel or other appropriate finish.
- 9) Troublesome materials such as painted carbon steel, wood exposed to weather, flammable materials, moisture-degradable materials, slippery floor materials, high maintenance materials, ultraviolet degradable materials, and materials which do not age well, shall be avoided. The use of wood (as in benches) and plastic resins (as in sealants and roofing) is not prohibited, but the use of materials with major natural limitations shall be justified according to trade-off of favorable and unfavorable qualities, including alternatives, cost and maintainability.

J. Longevity

- 1) A 50 year life, with minimal maintenance, has been established as a basic requirement of materials and finishes for the system.

- 2) Some materials, such as paint and filters are commonly expected to be replaced periodically. Some materials, such as the flashing on floor tile or the gloss on plastics, are expected to wear off with use for periods of over 10 years or less. In these cases, initial cost, maintenance, mode of failure and replacement will be weighed over 50 years to determine suitability.
- 3) Ideally, the system, after 50 years, will have incorporated original materials which have survived intact and usable, with ordinary wear and signs of age. Replaced and maintained materials will ideally have been replaced or maintained a minimal number of times within the 50 year period. Replacement and maintenance, where necessary, shall be of minimal cost and disruption to the system.

K. Cost

The cost of any of the materials or finishes must be consistent with its proposed location, overall aesthetics, functional qualities, type of maintenance required and ease of repair or replacement.

1.09.4 REQUIREMENTS FOR FLOORS

A. Public Areas

- 1) Floor surfaces in public areas receive continuous and heavy wear, and are extremely difficult to replace without impairing operations. The wearing properties of the floor materials are of special importance, particularly in areas of concentrated traffic where wear can produce cupped and dished surfaces which collect water and dirt and which can become hazardous and unattractive.
- 2) Slip-resistance is an important characteristic of materials used for floors. Homogeneous materials with a textured surface finish are preferred for obtaining slip-resistant characteristics. Surface

treatments wear away over time, therefore, any material which relies on surface treatments (such as surface-applied carborundum granules) to meet slip-resistance requirements will not be permitted. The minimum coefficient of friction shall be 0.6.

- 3) Maintenance considerations affect the selection of materials for floors. Certain materials, because of their texture, size, color variations or associations with outside environment, appear quite natural and maintain their attractiveness with a natural accumulation of dust or dirt or soiling from traffic. The use of these kinds of materials is encouraged to reduce the need for maintenance.
- 4) Access panels and manholes in floors and walks should be carefully located to avoid critical and public areas whenever possible. Refer to Architectural Directive Drawings.
- 5) Since the location of small items such as drains and cleanouts are difficult to control, it is not practical to integrate these items with floor unit patterns with great precision. Define their location as precisely as is practicable, but regard them as randomly located in the finished work. For this reason unobtrusive shapes and finishes should be selected.
- 6) Minimum compressive strength and maximum percentage of moisture absorption for various floor finish materials are specified in the technical sections of the specifications. Optional materials considered for use should have 8,000 psi, minimum compressive strength and 3.5 percent maximum moisture absorption (use ASTM C67 test).
- 7) Size of pavers shall be based on a nominal module of 8 inches by 8 inches.

- 8) Also refer to Section 1.09.8 B for electrical isolation requirements.

B. Nonpublic Ancillary Areas

- 1) Hardened concrete is an acceptable floor material except in certain special areas such as Battery Rooms, which require an acid and alkali resistant surface, and Train Control and Communication Rooms where special cleanliness requirements dictate a finish floor material such as resilient flooring. Concrete should have a finish which maintains a slip resistant surface when mopped.
- 2) Ceramic tile, quarry tile or polished concrete shall be used in Toilet Room and Custodial Service Rooms. Floor tile shall be unglazed and naturally slip-resistant without addition of abrasive. Do not use raised metal or marble thresholds. Terminate floor tile flush with other finishes, or provide edge of firmly set surface bull nose units.
- 3) Provide 5 inch high ceramic tile or quarry tile sanitary base in employee and public toilet rooms.

1.09.5 REQUIREMENTS FOR WALLS

A. Public Areas

- 1) Walls accessible to the public must be durable and require little maintenance.
- 2) Non-cementations surfaces must show no permanent discoloration when tested with methylene blue, lipstick, mercurochrome, or felt tipped markers, and must be sufficiently dent and blow resistant to resist disfigurement. The removal of spray paint by scraping, brushing or solvents and removers must not permanently disfigure these walls.

- 3) Walls not accessible to the public may be less resistant to defacement by vandals but shall be sufficiently durable and hard to withstand periodic cleaning.

B. Nonpublic Ancillary Areas

- 1) Walls must be durable and require a minimum of maintenance. Generally, cast-in-place concrete or concrete masonry units are acceptable. Certain areas such as the Train Control and Communications and Revenue Rooms should be painted to provide a dust free surface. Battery Rooms require an acid and alkali resistant surface.
- 2) Walls in Toilet Rooms and Custodial Service Rooms shall be finished with ceramic tile or an impervious, glossy coating.

1.09.6 REQUIREMENTS FOR CEILINGS

A. General Definition

The term "ceiling" as used in this section refers to three kinds of surfaces:

- 1) The exposed under portion of the entire structure where it consists of a framing system with a skin.
- 2) The exposed under portion or soffit of a floor or roof structure.
- 3) A complete, separate surface underlying a floor or roof.

B. Public Areas

- 1) Generally, the exposed under portion of the structure is an acceptable finish; however, in some areas it may be desirable to use either a stainless steel panel system or a Portland cement plaster ceiling.

- 2) In every case, there must be a complete integration of the ceiling with mechanical, electrical, lighting, signing, communication, and other systems which are contained within or which relate to the ceiling.
- 3) Due to the cast-in-place and the precast concrete items within a typical station coming from as many as four sources, a sandblast finish has been planned as a systemwide method of reducing non-uniformity in concrete finishes. This sandblast finish, together with a colorless, no-build sealer, shall be utilized to unify the natural variations in concrete.

C. Nonpublic Ancillary Areas

- 1) Generally, the exposed underportion of a floor or roof structure is an acceptable finish. Where rigid insulation of a durable nature is used, it may be left exposed. A spray coat of white paint is desirable to improve room lighting and orderliness.
- 2) Toilet Rooms should have a separate suspended Portland cement plaster ceiling or depending on the roof system, may be exposed structure.
- 3) Paint exposed piping and conduit within spaces, and paint unpainted equipment. Paint to match room color except where pipe or safety coding is required.

1.09.7 REQUIREMENTS FOR DOORS AND HARDWARE

- A. Doors, Frames, Doorway Panel and Exterior Louvers. All doors and frames shall be of the type and quality best suited for the function of the opening, shall be standardized systemwide and shall meet the requirements of the System Security Criteria, Volume I, Chapter 8. Acceptable doors shall be as follows:

- 1) Flush hollow metal swing doors & frames (typical systemwide) zinc bondevized.
- 2) Stainless steel coiling grilles (at station entrances)
- 3) Stainless steel doors and frames (at elevator cab and hoist way)
- 4) Hollow metal doors, flush transom panels, transom louvers, and wall louvers at the exterior of buildings shall all be of this same material and shall have the same finish. In no case shall a louver frame be set within a hollow metal frame. All frames shall appear at one uniform width.

B. Hardware

Builders hardware shall be standardized and great-grand-master keyed systemwide. Standard hardware finish shall be US32D - satin stainless steel.

- 1) Locksets shall be heavy duty mortise type (non-ferrous) with stainless steel trim and knobs. Electric latching and alarms shall be provided as required for safety and security.
- 2) Hinges in public areas shall be three-knuckle fixed pin stainless steel type.
- 3) Closers shall be heavy-duty surface-mounted type in simple rectangular cases finished to approximate lockset finish.
- 4) Stops, not overhead hold-opens, shall be provided for all doors. Locate floor stops out of traffic. Provide wall stops rather than floor stops where possible. Some doors will require hold-open hooks on the stops. In no case shall a door which swings 180 degrees have its swing interrupted by the projecting masonry at the door opening. In such a case, either move the door frame out to the face of the wall, or provide free standing bollards on which to mount the stops at the 110 degree swing position.

1.09.8 MATERIALS AND FINISHES FOR PUBLIC AREAS

A. Floors: Floors at platform level shall be materials having less than 3.5 percent water absorption, preferably less than 1.0 percent. Low absorption paving materials in conjunction with bond coat and grout materials having resinous admixes shall be used to minimize the passage of electric current. Concrete or mortar fill beneath thin-set material shall be a thickness to cover conduit and raceways by a minimum of two inches. Control joints in fill shall be spaced not more than 20 feet apart.

- 1) Platform and elevated concourse
 - a) Clay pavers*
 - b) Quarry tile
 - c) Brick pavers
 - d) Thermal finish granite
- 2) Concourse at grade
 - a) Stone (granite**, marble)
 - b) Clay pavers*
 - c) Quarry tile
 - d) Brick pavers
 - e) Polished concrete.

* = available with absorption rate of less than 3.5 percent

** = available with absorption rate of less than 1.0 percent.

B. Platform Edge Strip: To be determined.

- C. The platform paving material shall be isolated from the structure by use of high resistance epoxy material or similar electrically isolating material for a distance of at least 5' from the platform edge.

- D. Wall
 - 1) Stone, natural oolitic limestone (coral rock)
 - 2) Stone (granite, marble)
 - 3) Concrete unit masonry (architectural quality with integral finish, such as split-fluted face CMU).
 - 4) Solid glass brick masonry.
 - 5) Precast concrete with architectural finish.
 - 6) Brick masonry
 - 7) Stainless steel (type 316 alloy), for fascias and elevator/escalator cladding.

- E. Ceilings
 - 1) Exposed construction (precast concrete, cast-in-place concrete).
 - 2) Cement plaster
 - 3) Stainless steel panel ceiling systems (type 316 alloy)

- F. Parapet Walls and Railings
 - 1) Parapet Walls
 - a) Solid glass brick masonry
 - b) Stone masonry
 - c) Precast concrete with architectural finish

 - 2) Tubular Railings: Stainless steel (type 316 alloy). Indicate actual OD dimensions, i.e., 1.600 inch for 1-1/4 inch pipe, 1.900 inch for 1-1/2 inch pipe, etc.

- 3) Handrails: Stainless steel (type 316 alloy)

G. Skylights

- 1) Frames: Stainless steel (type 316 alloy) or hard coat aluminum with structural neoprene gaskets and permanently resilient sealants.
- 2) Glazing: Glass that cannot easily be vandalized or injure patrons below, glare reducing. Do not use screens or grilles. All assemblies must comply with prevailing Florida Building Code.

1.09.9 MATERIALS AND FINISHES FOR NONPUBLIC AREAS

A. Floors

- 1) Train Control and Communication Rooms: Troweled electrometric flooring.
- 2) Toilet Rooms and Custodial Service Rooms: Ceramic tile or polished concrete.
- 3) Battery Rooms: Acid and alkali resistant surface.
- 4) Mechanical, Electrical and Other Rooms: Exposed concrete with dense troweled finish.

B. Walls

- 1) Train Control and Communication Rooms:
 - a) Cast-in-place or precast concrete (painted)
 - b) Concrete unit masonry (painted)
 - c) Cement plaster (painted)
- 2) Toilet Rooms and Custodial Service Rooms:
 - a) Ceramic tile or quarry tile.
 - b) Impervious, glossy coating

- 3) Battery Rooms: Acid and alkali resistant surface
- 4) Mechanical, Electrical and Other Rooms:
 - a) Cast-in-place or precast concrete
 - b) Concrete unit masonry

1.09.10 MATERIALS AND FINISHES FOR PARKING GARAGES

A. Floors

- 1) Vehicular Areas:
 - a) Portland cement concrete paving
 - b) Asphalt concrete paving
- 2) Pedestrian Areas: Materials listed for floors in Public Areas

B. Walls

- 1) Precast concrete, architectural quality, at exterior.
- 2) Concrete unit masonry (architectural quality with integral pattern or finish).
- 3) Solid glass brick masonry.
- 4) Brick masonry.
- 5) Stone (natural oolitic limestone "coral rock").
- 6) Stone (granite, marble)
- 7) Cast-in-place concrete, architectural quality, at exterior.
- 8) Stainless steel (type 316 alloy) for fascias and elevator cladding.

C. Ceilings

- 1) Exposed construction (precast or cast-in-place concrete).
- 2) Portland cement plaster.

- D. Parapet Walls and Railings: Materials listed for parapet walls and railings in Public Areas.

1.09.11 MATERIALS AND FINISHES FOR STATION SITE WORK

A. Pavements for Vehicular Areas:

- 1) Asphalt concrete paving (except where buses and other heavy vehicles stand).
- 2) Portland cement concrete paving. Provide in gray color to reduce glare and visibility of dropped gum.
- 3) Concrete waffle pavers filled with crushed rock or grass.
- 4) Porous Portland cement concrete or asphalt concrete paving: In areas where percolation of surface water is desirable.
- 5) Pedestrian crossings in vehicular areas should be paved with materials listed for paving for pedestrian areas which are designed for vehicular traffic.

B. Sidewalks for Pedestrian Areas:

- 1) Cast-in-place concrete. Provide in dark gray color to reduce glare and visibility of dropped gum.
- 2) Concrete masonry pavers (interlocking type).
- 3) Cast stone (simulated oolitic limestone "coral rock").
- 4) Stone (natural oolitic limestone "coral rock").
- 5) Granite pavers
 - a) Belgian block, nominal 8 inches by 4 inches by 2 inches thick, thermal top and split sides.
 - b) Durax blocks, nominal 4 inches by 4 inches by 2 inches thick, thermal top and split sides.

- c) Belgian Blocks No. 1, all sides split, nominal size, 10 inches by 4 inches by 4 inches.
 - d) Durax Block No. 1, all sides split, nominal size 4 inches by 4 inches by 4 inches.
-
- 6) Brick paving.
 - 7) Exposed aggregate precast concrete pavers (London walk pavers) with sandblasted finish.
 - 8) Clay pavers.
 - 9) Quarry tile.
-
- C. Barrier and Retaining Walls:
- 1) Stone, natural oolitic limestone (coral rock).
 - 2) Stone, (granite, marble).
 - 3) Concrete unit masonry (architectural quality with integral finish).
 - 4) Cast-in-place concrete, architectural quality.
 - 5) Precast concrete, architectural quality.
 - 6) Brick masonry.

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1.10 FARE COLLECTION AREA

1.10.1 INTRODUCTION

1.10.1.1 The fare collection area shall provide the patron and the fare collection equipment with a space protected from the elements in which fares can be paid. It is the circulation control point at which the Station Attendant's booth and the fare collection array separate the free and paid areas of the station. Normally, anyone entering or leaving the paid area of the station must pass through the fare collection array.

1.10.1.2 All equipment located within the fare collection area, as defined in Section 1.10.5 of this Chapter, will be procured on a systemwide basis.

1.10.1.3 Quantities and placement of equipment to be located in each station shall be as shown on the Preliminary Engineering documents. Space shall be provided to allow for up to 50% expansion.

1.10.2 METHOD OF FARE COLLECTION

1.10.2.1 To be determined.

1.10.3 GOALS

1.10.3.1 The basic goals to be achieved in the fare collection area are:

- A. To facilitate passenger movement such that the fare collection process operates smoothly and with the greatest passenger convenience and safety.
- B. To provide adequate space for passengers queuing during peak periods.
- C. To allow as much flexibility and space in the fare collection area as practical to provide for growth in patronage.

- D. To locate and arrange the Station Attendant's booth so that adequate surveillance and order can be maintained in the fare collection process. The Station Attendant shall have unimpaired visibility of the fare entry turnstile and handicapped gate from within the normal working area of the booth. Other fare control areas shall be similarly visible from the booth or, alternatively, CCTV coverage with monitors in the booth shall be provided.
- E. To provide signing and layout of equipment to facilitate easy passenger understanding and use of the fare collection system.
- F. To provide a secure room in each station in which money collected from the turnstiles, or change destined for the change machines, may be safely stored and protected from robbery or unauthorized tampering.
- G. To provide barriers and fare equipment that is resistant to vandalism and cheating, but without an exaggerated visual emphasis on security or an evident distrust of the patrons.

1.10.3.2 In order to achieve the above goals:

- A. Station design shall be clearly structured and orderly producing a strong, simple and continuous visual image.
- B. Patrons should be able to locate and enter the pedestrian circulation system easily upon entering the paid area.
- C. Pedestrian routes should be as direct as possible, avoiding unnecessary turns, reverse turns and other circulation constrictions.

1.10.4 LOCATION

- 1.10.4.1 In order to obtain optimum distribution from the station entrance to the platform, the fare collection array shall be as close to the longitudinal center of the station as possible.
- 1.10.4.2 In the majority of center platform stations, patrons will enter the concourse directly through the fare collection area at grade.
- A. Paving outside the fare collection area shall slope away from the fare collection array at 1 percent to provide positive drainage.
 - B. A canopy shall protect the critical moving parts, coin slots, etc., of the fare collection array from direct sun and rain at an angle of 50 degrees to the vertical.
 - C. The area shall remain as open as possible and the only environmental controls provided shall be for the Station Attendant's booth.
- 1.10.4.3 Side platform stations and center platform stations with elevated mezzanines shall have the fare collection area located on an elevated mezzanine that spans a thoroughfare. Environmental controls and weather protection requirements shall be the same as in Section 1.10.4.1. For specific location, see Architectural General Plans.

1.10.5 EQUIPMENT

- 1.10.5.1 All equipment in the fare collection area shall be stainless steel to match the architectural finish metal of the station.

1.10.5.2 A Station Attendant's booth shall be located at the center of the fare collection array or such that all fare gates are easily visible from and accessible to the attendant's booth.

- A. A console will be provided in each Station Attendant's booth on which are mounted controls and indicators for each turnstile, handicapped gate, change machine and transfer machine. Controls will permit activating and shutting down each item of equipment, while indicators will be used to alert the station attendant when an equipment problem occurs, such as shortage of change, handicapped gate unlocked, insufficient transfer media or an equipment malfunction. The control/indication panel will be 24 inches long by 20 inches high by 12 inches deep for up to 3 full fare entry, one exit, and one reduced fare entry turnstile, one handicapped gate, three change machines and two transfer dispensers, as well as the control and status indication of the revenue room door.
- B. For more detailed information on Station Attendant's booth, see Section 1.06 of these criteria.

1.10.5.3 Fare gates shall be floor mounted with the type as specified for System wide procurement.

- A. Entry will be controlled by turnstiles whose barriers release on the recognition of valid fare media.
- B. To be determined
- C. All entry turnstiles will require insertion of the fare into the turnstile console to the right of the passageway.

- D. There will be at least one full fare entry turnstile, one reduced fare entry turnstile and one exit turnstile, at each fare control area.
- E. The maximum dimensions of the turnstile console will be one foot wide by six feet long and by three feet three inches high, with console spaces approximately 32 inches on centers. If the end console of the array abuts a wall, change machine, etc, a nominal space of 20 inches shall be provided between the console and obstruction. When the console abuts the two feet diameter column supporting the canopy above, the clear space shall be 10 inches minimum. Mounting arrangements will permit addition and removal of consoles to accommodate local patronage trends.
- F. Space will be provided at each station entrance to accommodate the number of turnstiles needed to handle the passenger loads expected at that station entrance in the design year determined by MDT. At least fifty percent more space will be provided than calculations indicate, to allow for changing patronage.
- G. Each full fare turnstile will have the capability of being switched to a reduced fare turnstile when the demand arises.
- H. At least one gate for those needing assistance will be located at each fare control area which can be released in either direction by the station attendant. It will also be equipped for panic operation for use in the exit direction. The door will open to a clearance width of 44 inches. This gate will also be used by the maintenance and service staff and emergency personnel.

- I. In the event of an emergency, passengers will be able to exit through free wheeling or open turnstiles at the rate of at least 25 persons per minute per gate and through the open handicapped gate at the rate of 100 persons per minute.

1.10.5.4 Change machines will be located in the unpaid area to serve incoming passengers who do not have a pass or bus to rail transfer and require change for operation of the turnstile.

- A. Change machines will be placed so they do not impede the direct flow between the station entrances and the turnstiles, yet will be clearly noticeable by passengers not familiar with the rapid transit fare collection operation.
- B. There will be at least two change machines at each fare control area.
- C. The maximum dimensions of the change machine will be four feet wide by three feet deep by seven feet high with spacing on four feet centers. Since the change machines supplied may be smaller than these dimensions, spacing of vendors must be kept at four feet to permit parallel use.
- D. Space will be provided at each station entrance to accommodate the number of change machines needed to handle the passenger loads expected at the entrance. At least fifty percent additional space will be provided to allow for changing patronage.

1.10.5.5 Transfer dispensers shall be provided in the paid area of each station.

- A. They will be placed so that they do not impede entering and exiting traffic flow, yet permit convenient issue of a transfer to a passenger.

- B. There will be at least two transfer dispensers at each station. Fare control areas that face each other and are separated by a common paid area will utilize the same transfer dispenser.
- C. The maximum dimensions of the transfer dispenser will be two feet wide by three feet deep by 42 inches high spaced approximately on three feet centers.

1.10.5.6 Removable barriers shall be provided between the initially installed fare gates, change machines and the permanent structure to provide expansion space for the equipment array.

These barriers shall be modular sections so that one piece of equipment or ore may be added without requiring alteration of the total barrier. For details, see Architectural Directive Drawings.

1.10.6 QUEUING AREAS

1.10.6.1 Adequate queuing space shall be provided in front of each item of equipment so that lines of patrons using the equipment do not extend into circulation spaces during normal peak conditions. The unimpeded queuing areas defined herein are measured from the face of the equipment to other queues, major circulation flows, such as those for escalators and stairs, or major physical obstructions. The minimum width shall be that of the equipment or of the passage width in the case of the turnstiles.

1.10.6.2 Turnstiles shall have a minimum queuing length of 20 feet on both the free and paid sides.

1.10.6.3 Change machines shall have a minimum queuing length of eight feet.

1.10.6.4 Transfer dispensers shall have a minimum queuing length of six feet.

1.10.7 DOORS AND CLOSURES

1.10.7.1 Doors for emergency egress shall be located at each end of the fare collection array to supplement the egress capacity provided by the fare gates. For details refer to Section 1.04, Station Configuration of this criteria and Architectural Directive Drawings.

1.10.7.2 A metal closure screen shall be provided to secure the open fare collection area during non-operating hours. For details refer to Section 1.04, Station Configuration of this Criteria and Architectural Directive and Standard Drawings.

1.10.8 GRAPHICS/LIGHTING

1.10.8.1 Graphics and lighting must be an integral part of the design process to insure that the patrons will be able to understand and use the system effectively.

1.10.8.2 Graphic panels shall be integrated with the canopy over the fare collection array and coordinated with the graphics on the equipment for ease of identification and orientation. For specific information refer to Volume VI, Manual of Graphic Standards and the Architectural Standard Drawings.

1.10.8.3 Proper lighting will insure that the fare collection area is easily recognized and used and that the area will be safe for patrons. The back lighted graphics; ambient station and site lighting are all integral to the lighting design of the fare collection area. For specific information refer to Section 4.07 of these criteria.

1.10.9 ELECTRICAL POWER/COMMUNICATIONS

- 1.10.9.1 Each item of equipment shall be supplied by a 120-volt 60 Hertz power source capable of delivering 15 amps with an individual circuit breaker for each equipment located within the Station Attendant's booth. The power shall be furnished within plus or minus one percent of nominal frequency and within plus or minus 10 percent of nominal voltage.
- 1.10.9.2 A raceway shall be provided between the Station Attendant's booth and all fare gates, as shown on the Architectural and Electrical Standard Drawings. The required dimensions of these raceways will be established at a future date. Dimensions will vary depending upon the number of gates served.

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1.11 STATION APPURTENANCES

1.11.1 INTRODUCTION

- A. Within each of the stations and station sites of various patron oriented appurtenances will be provided. Essentially, these items can be considered to be the "furniture" of the System, the provision of which completes the total service to the patron.

The convenience and comfort of patrons within the System is very important, and the inclusion of these significant but all too often neglected items is necessary to provide a fully functional transit system. This section of the criteria describes these items, their design, location, and importance. It is limited to a description of only those appurtenances contained within the stations proper. Site appurtenances are described within the Manual of Landscape Standards, Volume V of these criteria.

- B. All of the station appurtenances described herein, with the exception of the seating units and windscreens, shall be systemwide items. They shall be identical in design and configuration and shall be purchased and installed as part of separate systemwide procurement contracts. These procurements will ensure reduced costs per unit, timely replacement due to the ability to warehouse identical items, and cost effective maintenance. In addition, the inclusion of identical station appurtenances throughout the Stage I System further strengthens the patron's familiarity with the total System and how to operate within it making the System that much more convenient.

- C. The Station Designer shall be responsible for the preparation of those contract documents which are needed to define, describe and properly interface with these items.

- D. There are a number of general criteria which have been utilized in the station Basis for Design work and which should be kept in mind during the station's Final Design effort.
 - 1) In order to reduce the visual clutter and present a dignified and appealing station environment, station appurtenances shall be collected into coordinated assemblies to the greatest extent possible.
 - 2) Station appurtenances shall be sized and located in harmony with the station planning module of four feet.
 - 3) Station appurtenances shall be designed and located to permit the future addition of appurtenances.
 - 4) Station appurtenances shall be accessible and comply with the Florida Building Code.
 - 5) Station appurtenances shall be permanently mounted with vandal-proof attachments.
 - 6) Station appurtenances shall be of heavy duty, durable construction and shall be easily maintained.

1.11.2 STATION SEATING UNITS AND WINDSCREENS

- A. The only seating that will be provided within the station itself will be that which is located at the platform level. This is the area within the station where waiting is anticipated. These seating units shall be designed in combination with weather protective windscreens which shall protect both seated and standing patrons from sustained winds and gusts. The provision of this combination unit will play an important part in the

comfort of patrons and can add to the feeling of security as the patron awaits the arrival of the train.

- B. As indicated on the Architectural Directive Drawings, these units shall be placed near the center of the platform, within the four car length berthing area. Providing seating units for those patrons utilizing the System during the peak hours of operation, is not as important as providing for patrons riding during the off-peak hours when train headways are lengthened and trains are shortened to four and two car lengths. Thus, the units are provided in that portion of the platform only. In addition, the seating units will be utilized most often by those patrons using the elevators. Therefore, their provision near the center of the platform near the elevator ensures a short travel distance from the elevator to the seating unit.

The seating units at center platform stations shall be placed in a back-to-back arrangement with a longitudinal centerline matching with the station platform centerline. This will allow patrons to face the platform edge and the arriving train. The seating units at the side platform station shall be single sided units also facing the platform edge.

The seating units shall be placed such that they do not interfere with patron circulation and emergency exiting. Refer to section 1.05, Vertical Circulation, of this Volume of Criteria, for the required queuing zones at the escalators, elevators, and stairs.

- 1) Units shall be comfortable, heavy duty, durable, and vandal resistant.
- 2) Units shall be designed to prevent the concealment of persons.

- 3) All exposed metal surfaces shall be stainless steel without hazardous joints or edges.
- 4) All fastenings shall be concealed or tamperproof.
- 5) Units shall be permanently mounted to the platform floor and to each other with vandal-proof attachments.
- 6) Units shall support the user's back.
- 7) If wood benches are utilized, the wood shall be African Purple Heart or an equally hard vandal and weather resistant variety.

1.11.3 PUBLIC TELEPHONES

- A. Public telephones shall be purchased and installed as systemwide procurement items. Their number and location shall be as indicated on the Preliminary Engineering Documents. The station Designer shall be responsible for detailing and specifying the space and service requirements and coordination with Southern Bell which shall provide and install the telephone panel itself.
- B. Typically, each Station will have two public telephones within the station's "unpaid area" and two within the station's "paid area". One of each of these public telephones shall be accessible as prescribed by Code. They shall be located close to the Station Attendant's booth, preferably in his/her direct line of sight (though CCTV surveillance is acceptable) in such a way that the telephones and patrons utilizing them will not interfere with patron circulation and emergency exiting.
- C. A telephone equipment area shall be provided as part of the electrical equipment room as described in section 1.07, Ancillary Spaces, of this Volume of Criteria and as described on the Architectural and Electrical Directive Drawings.

- D. The public telephones shall be of the wall panel type, recess mounted, without enclosure, doors or seating. A shelf shall be provided within the recess. Telephone directories shall be placed under the shelf. Directories shall have hard cover with large typeface identification and shall be tethered or shall swing into viewing position.

All exposed metals shall be stainless steel with concealed or tamperproof fasteners. The recess shall be acoustically designed to minimize sound reverberation and to provide privacy. The installation shall be as durable as is possible and shall be easily cleaned. Surfaces shall be selected to discourage graffiti and to permit easy cleanup of jotted numbers. Units should offer a person the security of being able to rest purse or parcel safely while phoning.

1.11.4 DRINKING FOUNTAINS

- A. The number and location of drinking fountains shall be as indicated on the Preliminary Engineering documents. The station Designer shall be responsible for detailing and specifying the space and service requirements as indicated on the Architectural Standard Drawings.
- 1) Typically, one wall mounted drinking fountain shall be provided in the station concourse area. It shall be located such that it, and patrons utilizing it, do not interfere with patron circulation and emergency exiting.
 - 2) It shall be wall mounted as prescribed by the Florida Building Code.
 - 3) It shall dispense chilled water, the chiller being an easily replaced, integral part of the unit.

- 4) The drinking fountain's exposed surfaces shall be stainless steel with concealed or tamperproof fasteners.
- 5) The spout and hand control shall be mounted on the front of the unit. Foot controls shall not be used.

1.11.5 CLOCKS

- A. Station clocks shall be purchased and installed as part of the systemwide communications procurement contract. The clocks shall be incorporated in the longitudinal graphic signage elements placed above the fare collection area and as such shall be installed in concert with the systemwide graphics procurement contract.
 - 1) The clocks shall be round, of the semaphore type, and fully synchronized through a systemwide master/slave clock system. Sweep second hand is not required.
 - 2) The clocks shall have lighted faces with clear, shatterproof lenses.
 - 3) They shall be designed to resist damage by vandalism and to withstand long term transit use.
 - 4) The clock case shall be fabricated of stainless steel.
 - 5) Numerals shall conform to the Manual of Graphic Standards (Volume VI).

1.11.6 WASTE RECEPTACLES

- A. Waste receptacles shall be purchased and installed as systemwide procurement items. Their number and location shall be as indicated on the Preliminary Engineering documents. The station Designer shall be provided with an Architectural Standard Drawing which shall indicate the nature of the mounting attachment condition.

- 1) The mouth of the waste receptacle shall remain closed when not in use and shall be operable with a gentle push.
- 2) It shall be constructed of stainless steel and designed to be as easily cleaned and vandal-proof as possible. Unnecessary seams, joints, hard to clean corners, and horizontal dust collecting surfaces shall be avoided. All material fasteners shall be concealed or tamperproof. Provide for drainage.
- 3) It shall contain an inexpensive, removable, watertight, non-corroding, replaceable, receptacle module large enough to prevent frequent emptying.
- 4) The waste receptacle shall be constructed totally of noncombustible materials and incorporate a self-extinguishing lid design.
- 5) It shall be designed to minimize the effects of explosive materials by conforming to FTA requirements for bomb resistant receptacles.

1.11.7 ASH RECEPTACLES

- A. Ash receptacles shall be purchased and installed as systemwide procurement items. Their location shall be outside the paid area and the number shall be as directed by MDT.
 - 1) It shall be constructed of stainless steel and designed to be easily cleaned and as vandal-proof as possible. Unnecessary seams, joints, hard to clean corners, and horizontal dust collecting surfaces shall be avoided. All material fasteners shall be concealed or tamperproof.
 - 2) The ash receptacle shall have a removable, non-corroding, replaceable, sand extinguishing type receptacle module large enough to prevent frequent emptying.
 - 3) The ash receptacle shall conform to FTA requirements for bomb resistant receptacles.

1.11.8 NEWSPAPER VENDING MACHINES

Newspaper vending machines shall be purchased and installed as systemwide procurement items. Their number and location shall be as indicated on the Preliminary Engineering documents. The station Designer shall be provided with an Architectural Standard Drawing which shall indicate the nature of the mounting/attachment condition.

Provide a shatterproof plastic window in each door that will permit user recognition of each newspaper's front page heading or logo.

1.12 ADVERTISING AND ART

1.12.1 SCOPE

The following criteria define the architectural functional planning aspects of commercial advertising and art at transit station facilities as indicated in the Standard and Directive Drawings and Manual of Graphic Standards. Further details are provided in the following subsections to assure proper coordination of commercial advertising graphic elements and visual art at transit stations.

1.12.2 ADVERTISING

1.12.2.1 General

Design policy pertaining to commercial advertising within transit stations shall conform to the considerations and provisions of the criteria described herein to insure continuity of configuration, consistency of placement, compatibility with station design, station graphics and maintenance procedures on a Systemwide basis.

1.12.2.2 Policy

Current Miami-Dade County policy towards commercial advertising dictates that it be planned for through the formulation of specific design criteria.

1.12.2.3 Location

- A. Commercial advertising shall be allowed for and permitted only in selected and controlled areas of the station and the transit vehicle interior consistent with the recommendations defined in the Manual of Graphic Standards, and Standard and Directive Drawings.
- B. Commercial advertising shall be located in a manner which does not obstruct passenger flow, conflict with directional and/or informational signing, or create haphazard display effects.

- C. Commercial advertising elements shall be wall mounted and maintain a minimum horizontal clearance of 10 feet from all station entrances and exit points, vertical circulation elements, fare collection areas and Station Attendants' booths.
- D. Commercial advertising elements shall be located so as not to obscure the view of the station concourse from the Station Attendant's booth.
- E. The placement and configuration of commercial advertising elements shall be coordinated with the 4 foot horizontal planning module of the station.

1.12.2.4 Configuration

- A. For station facilities, the commercial advertising element, configuration, general material types and finishes, mounting methods and construction details will be similar to transit related graphic elements and will be uniform on a systemwide basis.
- B. For transit vehicles, the commercial advertising element, configuration, method of installation, construction details and location shall be uniform on a systemwide basis.
- C. Commercial advertising elements shall not duplicate in graphic style transit related directional and/or informational signage.
- D. The configuration of commercial advertising elements shall be of the panelized, rear lighted, transparency insert type as indicated in the Standard Drawings.

- E. Advertising elements shall not increase the fire hazard permitted for interior finishes as defined in Volume I, Chapter 9, of the Station Design Criteria dealing with Fire/Life Safety Criteria.

1.12.3 ART

1.12.3.1 General

Design policy pertaining to the incorporation of works of art with public transit facilities shall conform to the considerations and provisions of the criteria described herein to ensure the proper coordination and integration of works of art with the final design and construction phases of station development.

Art shall be incorporated in the System as prescribed by and as administered by the Miami-Dade County Art in Public Places Program.

1.12.3.2 Program Objectives

The broad objectives of this program shall be to assist MDT in the incorporation of works of art with public transit facilities; assist in the preservation of the artistic heritage of South Florida; assist in the enhancement of the professional community of artists; and promote a community environment which provides equal and abundant opportunities for exposure to the fine arts and all other cultural forms.

1.12.3.3 General Qualifications

- A. According to Miami-Dade County Ordinance No. 73-77, works of art shall include but not be limited to:
 - 1) Paintings
 - 2) Sculpture
 - 3) Engravings

- 4) Carvings
- 5) Frescos
- 6) Mobiles
- 7) Murals
- 8) Collages
- 9) Mosaics
- 10) Statues
- 11) Bas relief's
- 12) Tapestries
- 13) Photographs
- 14) Drawings

- B. Works of art shall also have the potential to complement overall transit facility design concepts, site development and station landscaping within the guidelines established in Section 1.12.3.5 of these criteria.
- C. Works of art to be integrated with building and site design shall be coordinated with the Designer so that provisions for electrical panels, buried structural members and connections in floors or walls and general incorporation into the architecture may be accommodated in preliminary design concepts to preclude design changes at a later date.
- D. Works of art must be of permanent, durable materials suitable for the transit environment, affording resistance to exposure, vandalism, relocation or theft and maintenance costs.

1.12.3.4 Project Coordination

- A. Full coordination and collaboration shall be achieved between the Designer and the artist(s) to insure that the final design of both the

transit facility and the work of art are compatible and can proceed together.

- B. The Designer shall be responsible for clearly and thoroughly establishing the interface between the work of art and other station final design work in the Contract Documents.
- C. All of the selected artist's design work for the project shall be subject to the review and approval of MDT to insure compliance with Station Design Criteria contained in this volume.
- D. Section Designers shall have a working knowledge of Miami-Dade County Ordinance No. 73-77 setting forth the responsibility of the Designer regarding the selection of artists and the commissioning and acceptance of works of art.
- E. In some cases it may be appropriate to purchase or receive by donation existing works of art. In such instances, concurrence of the Designer and MDT will be required.

1.12.3.5 Location

Recommended areas within the station and station site which may be used to locate works of art include the following:

- A. Station/Facility Site
 - 1) Intrasite pedestrian walkways
 - 2) Pedestrian site plazas
 - 3) Landscaped areas
 - 4) Bicycle paths and parking areas

- 5) Perimeters around parking lots, parking structures and kiss and ride areas

B. Station

- 1) Fare area security walls flanking the concourse entry
- 2) Perimeter areas surrounding and immediately adjacent to the station concourse.
- 3) Concourse enclosure walls, screens and barriers.
- 4) Areas complimenting the Station architecture such as flooring and glazing.

1.12.3.6 Materials

- A. A partial list of recommended materials which may be considered is as follows:

- 1) Precast concrete
- 2) Cast-in-place concrete
- 3) Terrazzo
- 4) Clay unit masonry products
- 5) Stone
- 6) Pre-finished metals such as stainless steel and bronze
- 7) Glass and glazing.

- B. If tile mosaics are considered, and are placed within reach of the public, the pieces shall be carefully abutted or recessed to avoid dislocation by either forced or natural means.

- C. Works of art shall be located and configured so as not to distract or conflict with informational or directional transit related signage.

- D. Works of art may also include landscaping, landscape lighting, paving, reflecting pools and fountains.

- E. Works of art shall comply with the fire hazard requirements defined in Volume I, Chapter 9, dealing with Fire/Life Safety.

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1.13 SIGNAGE

1.13.1 GENERAL

- A. System Signage shall conform to the latest edition of the MDT Manual of Graphics Standards.

- B. To make the transit experience as safe and easy as possible, signage will be provided to:
 - 1) Guide transit patrons to their destinations and the various modes of travel available to them.
 - 2) Inform transit patrons about use of the facilities.
 - 3) Promote safety and security through warning and directive messages.

- C. All signs shall meet the standards of the American's with Disabilities Act (ADA) prevailing at the time of fabrication / installation.

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