

CHAPTER 4

STATION PLATFORMS



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I. DESIGN INTENT

Large numbers of people will utilize TRI-RAIL stations as part of their daily routine. The majority of this experience will result from the time passengers spend waiting for trains at the platform.

Platforms at TRI-RAIL stations shall be designed to achieve the objectives outlined below.

I.A ALLOW CUSTOMERS TO WAIT IN SAFETY AND COMFORT

- a. Platforms should be clearly visible from all parts of the Station; no portion of any platform should seem isolated or remote from the rest of the Station, or from the surrounding community.
- b. Platform lighting shall be in accordance with the guidelines promulgated in Chapter 6 of these Guidelines.
- c. Platforms shall be provided with full-length canopies and adequate windscreens to ensure reasonable passenger comfort under severe weather conditions.
- d. Passenger information systems and public address systems shall be in accordance with the guidelines promulgated in Chapter 5 of these Guidelines.
- e. Ancillary facilities such as Station Buildings (where provided), TVM enclosures, and overpass structures shall be clearly visible from the platform, and convenient to use.

I.B SHOW CUSTOMERS THE MOST CONVENIENT MEANS OF ENTRY AND EXIT

- a. Platform layouts and signage should be representative of circulation patterns within the Station.
- b. All points and means of access to platforms shall also permit egress from platforms.
- c. Stairways, ramps, elevators, and escalators, where used, shall be located to facilitate convenient access to, and swift egress from platforms.

I.C HAVE AN APPEARANCE WHICH CONVEYS A COHERENT SYSTEMWIDE IDENTITY

- a. Use of consistent design elements, colors and finishes to enhance systemwide identity is encouraged.
- b. Platforms and canopies that are to be added to existing Stations shall match the architectural image, color, finishes and construction components of the existing Station.

I.D PROVIDE FURNISHINGS AND ACCOUTERMENTS WHICH ENHANCE CUSTOMER SAFETY AND COMFORT

- a. Platform fixtures and furnishings shall be provided in sufficient quantity to provide for anticipated loading.
- b. Fixtures and furnishings such as seating, trash receptacles, windscreens, and the like shall be adequately distributed to prevent overcrowding, and facilitate even loading of incoming trains.

II. PLATFORMS

II.A PLANNING AND DESIGN

The location and configuration of platforms for TRI-RAIL stations will generally be determined by existing track alignments, and the right-of-way boundaries of the rail corridor. The guidelines delineated in this Chapter must be applied within those constraints.

Several TRI-RAIL stations are shared with other train providers, most notably Amtrak. At these stations, certain design criteria, such as platform length, may be modified to suit the service requirements of these other providers.

II.A.1 Platform Configurations

The following guidelines apply to side platforms, which are the preferred configuration. In the event an island platform is required, additional elements and clearances will be required. These additional elements and clearances will significantly affect platform widths, end layouts and drainage requirements. For island platform configuration requirements, please refer to Section II.A.3

- i. **Length:** Platforms shall be 400 ft. (nominal) in length. Tri-Rail/AMTRAK stations shall have a minimum platform length of 1,000 feet.
- ii. **Width:** 25'-0" minimum, with additional width as necessary to meet the "Platform Area" criteria under II.A.2.
- iii. **Alignment:** Platforms should be located along tangent track. Where this is not possible, the total track curvature along the entire length of the platform shall not exceed 1°40'.

iv. **Slope & Curvature:** Essentially level and flat, except as follows:

- a. **Drainage:** Maximum grade on the platform shall be 2%; minimum grade on the platform shall be 1%. Tolerances shall be maintained to eliminate "bird baths" on the finished platform surface. Platform grades shall correspond to the track grade and be sloped to drain away from tracks.
- b. **Longitudinal Slope:** Slope of platforms in the direction parallel to the tracks shall match slope of the adjacent track, except at those location that must be ADA compliant.
- c. **Vertical Curvature:** When tracks experience vertical curvature within the limits of the station platforms, the edge of each platform shall have vertical curvature applied to match the adjacent track.

v. **Horizontal Track Clearance:** The required distance from centerline of the near track to the platform edge shall be 5'-1 1/8". The minimum clearance from edge of platform to face of elevator/stair tower structure shall be 20'-0". The minimum clearance from centerline of nearest outside track to canopy column or post shall be 12'-0".

II.A.2 Platform Area

The minimum net area of each platform shall be no less than 83.3% of the total square footage of the platform, exclusive of platform edge "clear zones", structural elements, vertical circulation elements, queuing spaces for designated station elements, and any restricted or otherwise unusable areas.

- i. A 2'-0" wide platform edge clear zone shall extend the entire length of each platform.

- ii. The minimum platform width delineated herein shall be increased as necessary to meet this requirement.
- iii. Should property lines or other geometric restrictions limit the platform widths, platform lights may be extended as necessary to meet this requirement.

II.A.3 Island Platform Configurations

- i. **Length:** Platforms shall match the same length of the side platforms.
- ii. **Width:** 27'-0" minimum, with additional width as necessary to meet the "Platform Area" criteria under II.A.2.
- iii. **Alignment:** Platforms should be located along tangent track. Where this is not possible, the total track curvature along the entire length of the platform shall not exceed 1°40'.
- iv. **Slope & Curvature:** Essentially level and flat. (See II.A.IV. a-c)

II.A.4 Queuing Space

Platforms shall be designed with sufficient queuing space to allow for the orderly formation of lines at designated elements, without causing disruption of other passenger flow routes.

Queuing areas shall be dedicated for only that purpose; no station fixtures or furnishings, structural elements, or other obstructions shall intrude such areas.

Queuing areas for designated elements shall have the following minimum clearances:

Element	Min. Clearance
Elevators (from threshold)	10'-0"
Stairs (from working points)	12'-0"
TVM's & Validators	8'-0"

II.A.5 Support Areas

Equipment rooms and support areas shall not be located within platform areas, nor should access to such areas directly from platform areas.

Equipment rooms shall include mechanical, electrical, and storage areas.

II.A.6 Platform Water Supply

Water supply connection points shall be provided for platform cleaning purposes. A minimum of 2 connections per platform shall be located in a place which facilitates their use for cleaning, and shall be wall mounted located in recessed lockable boxes.

All water supplies to fixtures in public areas shall have key-operated service valves. Each connection shall be designed for the pressure as recommended by the fixture manufacturer but not less than 15 psi for flush valves and not less than 8 psi for other fixtures. Water supply to lavatories and flush-valve fixtures shall have water shock absorbing provisions. Vacuum breakers shall be provided on all outlets with hose bib connections and submerged inlets.

- i. Design shall be in accordance to local and state requirements, including material, depth cover, fittings, and applicable permit conditions.
- ii. Connections shall be loose key-operated, wall or deck hydrants, with lockable covers.
- iii. Water supply piping shall be run in a concealed manner.
- iv. Suitable drainage provisions shall be included at each connection point.
- v. One chilled drinking water fountain per station shall be provided at a minimum.
- vi. One employee bathroom per station shall be provided at a minimum.
- vii. Low pressure water valves shall be used to the extent possible.

Whenever feasible, employee bathroom shall also provide a shower.

II.B TICKET VENDING MACHINES (TVM'S)

II.B.1 TVM Enclosure

The TVM enclosure shall be a lockable enclosure where money and fares can be withdrawn from the equipment in a secured space. The TVM enclosure shall be three-wall masonry and roofed. The open side shall be secured with a lockable, solid panel coiling door. The lock shall use TRI-RAIL's standard key for TVM enclosures.

Dimensions: The TVM enclosure shall accommodate five (5) TVMs and two Stand-Alone Validators (SAV). TVM size may vary by manufacturer. The footprint required for each TVM shall be approximately 3'-6" x 2'-6".

- i. **Floor:** Pavement under the TVM shall be designed for the weight of the TVM, approximately 1200 pounds.



Figure 4.1 - TVM and Vending Machine Enclosure

- ii. **Clearances:** A clearance of 6 inches to the rear and 24 inches lateral of each machine shall be provided

- iii. **Power:** Separate power and communication conduit and cabling shall be provided to each TVM. SAVs shall be located on top of a pedestal or steel pole provided by the SAV supplier. Separate power cabling shall be provided to each SAV. SAVs can share conduits with TVMs. A minimum of 6 feet of slack in the power line shall be provided. Individual circuit breakers for each TVM and the SAVs shall be provided.

II.B.2 Vending Machine Area

Vending machine space (to accommodate two vending machines) and electrical power receptacles shall be provided to authorized vendors for their equipment. The vending machine space shall have three perimeter sides with walls or screens and a roof covering to protect passengers from inclement weather. Vending machine space shall be wide enough to accommodate security cages.

II.C CONSTRUCTION

II.C.1 Platform Edges

- i. **Offset:** 5'-1¹/₈" from centerline of adjacent track.

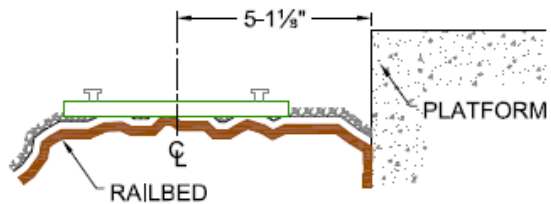


Figure 4.2 - Platform Edge Offset from Track Centerline

- ii. **Elevation:** 8" above top near rail.

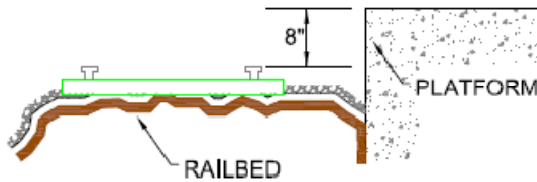


Figure 4.3 - Platform Edge Height Above Top of Rail

For other clearance dimensions, refer to the CSXT Clearance Diagram in the Appendix G.

II.C.2 Tactile Warning Surfaces

ADA compliant tactile warning surfaces shall be provided along platform edges.

Tactile warning surfaces shall be continuous, running the full length of trackside platform edges, then returning 90° at platform ends, and continue for a distance of 5'-0", or the entire length of such platform ends that are not protected by railing, whichever is greater. Please refer to **Figures 4.4 and 4.5**.

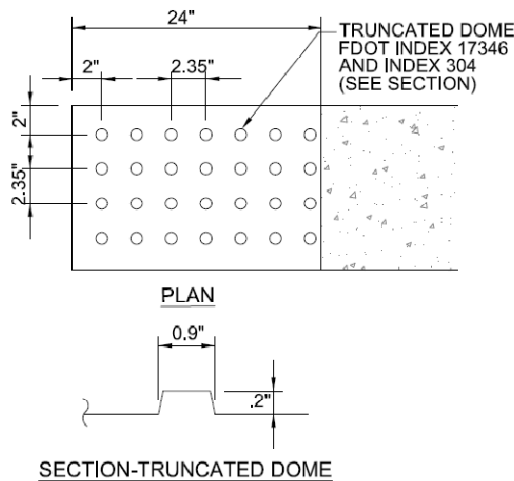


Figure 4.4 - Tactile Warning Surface at Platform Edge

- i. **Design:** Truncated domes aligned in a square grid pattern, in accordance

- with Section 1108 of the ADA Accessibility Guidelines (ADAAG).
- ii. **Length:** Full length of platform, continuous.
- iii. **Width:** 24" minimum.
- iv. **Color:** Safety Yellow, except along open edges of "mini-high" wheelchair loading ramps. Tactile warning surfaces along edges of "mini-high" shall be International Blue.
- v. **Fiberglass Panel Installation:** Where used, fiberglass panels shall be installed using a full bed of contact adhesive supplemented by mechanical manufacturer's instructions.

Panels shall be installed with their base surface level with, or slightly higher than, the platform surface. Maximum surface level variation shall not exceed 1/4" across the width of the panel.

II.C.3 Materials

- i. Platforms shall provide a durable pavement of size and grade elevation for passengers to safely board and exit the train.
- ii. Platform shall be of concrete pavement with perimeter concrete foundations.
- iii. Platform top surface shall be finished with a non-slip finish, scored and jointed to minimize the effects of cracking.
- iv. At existing Stations that do not require reconstruction, new platforms shall match existing platforms with regard to floor finishes, railing and guardrail details and other visual elements.



Figure 4.5 - Tactile Warning Surface
at Platform End

- v. Platforms shall not have a cantilever slab detail and grinding or cutting the edge of platform to conform to track clearance is not permitted.

III. PLATFORM ACCESS

Access to platforms should be clear and direct. Where possible, access points should be placed in a manner which prevents overcrowding and encourages even dispersal of passengers along platforms, thus facilitating access and egress.

III.A STAIRS

Access to each level of the station shall be provided by at least one stair, open to public areas, and designed to carry two-way pedestrian traffic.

III.A.1 General Considerations

- i. **Location:** Stairs should be conveniently located, and easily seen from all areas of platforms. Maximum travel distance from any point on a platform to a stair should not exceed 250 feet.
 - ii. **Materials:** Stairs shall be constructed of robust, non-combustible materials suitable for use in high pedestrian traffic areas. Stair treads and nosings shall have slip-resistant surfaces.
 - iii. **Configuration:** The maximum nominal slope of stairways shall be less than 35.54° from horizontal. Winding, curved, and spiral stairways shall not be permitted. No horizontal turns greater than 45° shall be allowed.
 - iv. **Covering:** Stairs between platforms and overpasses shall be covered with canopies to match platform and/or overpass canopies. Stairs at platform entrances, or other station areas, may be covered with suitable canopies, determined on a case-by-case basis.
- v. **Windscreens:** Windscreens should be provided at overpass stairs, overpasses, and wherever wind conditions may warrant their use. Windscreens shall be sufficiently transparent to ensure customer security.

III.A.2 Materials and Performance

- i. **Nosings:** Leading edges of stair treads shall be provided with round nosings having a radius of between $\frac{1}{4}$ " to $\frac{3}{8}$ ". Tread nosings shall be visually distinct from treads and risers. Protruding or overhanging nosings shall not be allowed.
- ii. **Risers:** Each riser shall rake back at an angle from the nosing edge to the intersection with the tread below. Total rake, measured from nosing edge to intersection of tread and riser, shall not be less than $1\frac{1}{4}$ " and not more than $1\frac{1}{2}$ ".
- iii. **Railings and Handrails:** Must be ADA compliant, have no sharp edges or exposed ends. Railings shall return to a supporting wall or post. Railings shall have predominately vertical intermediate elements, rather than horizontal, to discourage climbing.

For Critical Stair Dimensions, please refer to Table III.A.

III.B LOCKDOWN CONTROLS

III.B.1 Lockdown Controls

- i. Each Station, including both platforms, shall be equipped with lock-down controls to lock-out persons from entering the elevator/stair towers from the platform and having access to the crossover pedestrian bridge at each Station. These provisions shall include motorized coiling doors (swing gates or swing doors are not permitted) to block access routes that can be activated on

site, both manually and by time clock, and from a remote location.

A hatch access to manually open or close any a mechanical lock down

TABLE III.A CRITICAL STAIR DIMENSIONS				
STAIR ELEMENTS	MIN.	MAX.	FIXED	OTHER
Stair Width	8'-0"	-	-	
Stair Landing Length	7'-0"	-	-	
Vertical Distance Between Landings	9'-4"	12'-0"	-	
Stair Slope (nominal, from horizontal)	30.57°	32.47°		
Stair Riser Height	6½"	7"	-	
Stair Tread Length	11"	12"	-	
Tread/Riser Ratio: T+2R=	n/a	26"	-	
Risers per Flight	3	18	-	16 preferred
Handrail Height from nosing line	-	-	34"	
Handrail Diameter	-	-	1½"	
Handrail Clearance from wall or balustrade	2¼"	-	-	
Balustrade Height	46"	-	-	
Center Handrail (stair ≥ 12'-0" wide)	-	-	-	Required
Tread Working Line to obstructions above	8'-0"	-	-	
Tread Working Line to ceiling soffits	9'-0"	-	-	

- ii. Other provisions shall include: vandal-proof barriers, if required by the Station design; lock down devices for elevators; conduit and electrical cable to a central control panel for a remote operation connection; key activated controls; master key system for all Stations in this Contract; and visible and audible pre-activation dynamic warning signage and alarms. Both audible and visual alarms are required during door operation.

device is required in case of mechanical failure.

III.C. RAMPS

Ramps should be provided as necessary to make platforms and other station facilities accessible to those passengers with special needs.

III.C.1 Program and Design Guidelines

Ramp locations should be coordinated with locations of platforms, accessible parking

spaces, bus and passenger drop-off areas, overpasses, ticketing facilities, and station buildings, where included. Curb ramps, or other appropriate surface transitions, shall be provided where grade changes exceed $\frac{1}{2}$ ".

- i. **Dimensions:** Ramps shall be a minimum of 48" wide (60" wide preferred). The maximum gradient (rise:run) of any ramp shall be 1:12.

The maximum continuous horizontal run of a ramp shall not exceed 30 feet. If a greater horizontal run is required, landings and/or switchbacks shall be provided.

Landings, where used, shall be at least 60" deep, and of the same width as the ramp. Where a ramp is part of the ADA accessible route, it shall meet all requirements as set by ADAAG and the Florida Accessibility Code.

- ii. **Appearance Standards:** Ramp construction shall match that of adjacent platforms and/or walkways.

Ramps should be constructed on compact fill wherever possible. Where unavoidable, open spaces beneath ramps shall be cleared, graded, and screened to prevent the accumulation of litter and debris.

Railings and handrails, conforming to the requirements of this Chapter, shall be provided at all ramps and landings. Railings and handrails shall meet platform railings and handrails smoothly, and shall be of the same overall design.

III.C.2 Materials and Performance

Ramps shall be constructed of cast-in-place or pre-cast concrete, finished to match platforms and other walkways.

- i. **Surfaces:** Walking surfaces shall have a slip-resistant tooled finish.

- ii. **Railings and Handrails:** Mounted to outer edges of ramp slabs, with post plates and ADA-compliant kickplates.
- iii. **Stainless steel is preferred over aluminum.**

III.C.3 Handicapped Ramp (Mini-High Platform)

Platforms shall have a handicap ramp, level, and raised 13 inches above the platform (21 inches above the top of rail) for the physically challenged passenger to access and exit the train. The handicapped ramp shall be of concrete, finished with a non-slip finish, with guardrails and handrails. A two inch high concrete curb shall be furnished at perimeters having guardrails or handrails. All handicapped ramps shall be on the north end of the platforms. Ramp slope shall not exceed 1:16.

III.D OVERPASSES

At least one overpass shall be provided at each station to ensure that all platforms can be accessed from either side of the tracks.

III.D.1 Program Design Guidelines

Overpasses should be located to optimize pedestrian flow, taking into consideration platform lengths and access points, and the location of ticketing and other station facilities.

- i. **Dimensions:** Minimum width of overpass shall be 12'-0"; minimum height shall be 8'-0" at the sides, and 9'-0" at the centerline.
- ii. **Clearances:** Undersides of overpass structures shall have a minimum vertical clearance of 24'-3" above top of rail.

Overpass interiors shall have a minimum clear height of 11'-0", and 8'-0" at centerline, inclusive of lighting fixtures, speakers and other overhead obstructions.

- iii. **Access:** Overpasses shall be accessible by both stairs and elevators, conforming to the requirements of this Chapter and Chapter 7, respectively.
- iv. **Appearance Standards:** Overpasses shall be compatible in design with the architecture of the station and shall maximize openness while providing a reasonable measure of weather protection for occupants.

Overpasses shall be sufficiently enclosed to prevent throwing of objects from the overpass to the platform and tracks below. Fenestration may consist of glazing, screening, or a combination of both. Transparency should be maximized to enhance customer security. Architectural design shall include provisions to discourage bird nesting.

III.D.2 Materials and Performance

Overpasses shall be of concrete, masonry and/or structural steel construction. For efficiency of erection, overpass spans should be designed for off-site fabrication, to be lifted into place on field-built support towers, which would include necessary elevator shafts and stair mounting provisions.

- i. **Design Loads:** The following structural loads should be accommodated:
 - a. Live load of 100 psf
 - b. Roof load of 30 psf
 - c. Wind load of 30 psf
- ii. **Finishes:** Finishes shall be vandal-resistant and easy to maintain.
 - a. Metal surfaces: Stainless Steel Aluminum or Powder coated
 - b. Glazing: Laminated safety glass
 - c. Flooring: Slip-resistant concrete, tile or fiberglass. Floor drains shall be provided.

- iii. **Lighting:** In accordance with the requirements of Chapter 6 of these Guidelines.

- iv. **Ventilation:** Natural, mechanical, or both, as necessary to prevent build-up of heat and odors.

- v. **Roof:** The crossover pedestrian bridge shall be fully roofed, with a positive stormwater drainage system to divert stormwater away from passengers and the track rail bed.

- vi. **Envelope Enclosure:** The envelope enclosures to the crossover pedestrian bridge and the elevator/stair towers shall:
 - a. provide passengers protection from wind-blown rain (assume rain is falling at a 30 degree angle from the vertical)
 - b. permit visibility of passengers within the enclosure from the outside
 - c. prevent objects larger than 1 ½ inches in diameter or cross sectional dimension to pass through

- a. provide passengers protection from wind-blown rain (assume rain is falling at a 30 degree angle from the vertical)
- b. permit visibility of passengers within the enclosure from the outside
- c. prevent objects larger than 1 ½ inches in diameter or cross sectional dimension to pass through
- vii. **Maintenance:** Provide for manual access and fall protection to maintain roof of stair towers and bridge, as well as all facades of the pedestrian overpass. Manual access to roofs shall not include the need of a crane, truck and other mechanical devices. Fall protection shall be provided to allow maintenance personnel to attach harness and be able to move around.

Each pedestrian overpass shall have a hose bib at the top of the stair tower, and shall be wall mounted, located in a recessed lockable box.

III.E. AT-GRADE CROSSINGS

III.E.1 General

- i. This Section specifies Requirements for at-grade railroad-highway crossings. Specifically, this Section discusses the general arrangement, civil engineering and track-specific issues.
- ii. It is the intent of TRI-RAIL to make the SFRC a “full closure” corridor. Where permanent or temporary closing of grade crossings is not possible, “full closure” shall be accomplished by the following methods:
 - a. Four-quadrant gates.
 - b. Three-quadrant gates, with 9-inch non-mountable curb.
 - c. Two-quadrant gates, with 9-inch non-mountable curb.
- iii. Full closure crossing design and construction shall be in accordance with FDOT’s Signal Safety Program & Guidelines, Florida Green Book, the AASHTO Policy on Geometric Design Criteria, the Manual of Uniformed Traffic Control Devices (MUTCD), and Chapter 5 of the AREMA Manual of Railway Engineering. Grade crossing design at all SFRC grade crossings shall also follow the proposed rule changes in USDOT’s 49 Code of Federal Regulations Parts 222 and 229, Use of Locomotive Horns at Highway-Rail Grade Crossings, Proposed Rule, January 2000, or latest version.

III.E.2 Warning Devices

At a minimum, warning devices used on the SFRC shall consist of the following:

- i. Flashing lights shall be located for each lane of traffic. Where required, cantilever or bridge structures shall be used to ensure proper placement of flashing lights.
- ii. Crossbucks indicating the number of tracks at each crossing shall be employed with flashing lights.

- iii. Gates shall be employed at each crossing. All crossings shall have approach gates that span across the entire approach roadway. Four-quadrant and three-quadrant systems shall have exiting gates that shall also span across the entire roadway.
- iv. Median Barriers: Lanes that do not have exiting gates shall be protected by median barriers on the adjacent approach lanes.

Pavement markings and signage including advanced warning signs shall be in accordance with FDOT standards.

III.E.3 Crossing Gates

Traffic control systems for grade crossings shall include all gates, bells, flashers, signs, signals, support structures, markings, and illumination devices required to facilitate safe and efficient operation of both rail and roadway traffic. These devices and associated systems and practices shall employ the basic considerations of design, placement, operation, maintenance, and uniformity generally used for traffic control devices as described in the MUTCD and the CSXT Signal Standards. They shall regulate, warn, and guide trains, roadway vehicles, and pedestrians at each grade crossing safely and efficiently.

The crossing gates shall be provided in lengths and of materials in conformance with CSXT standards.

- i. **Gate Mechanisms:** The gate mechanisms for the new equipment shall be interchangeable with the gate mechanisms currently in place at the crossing and shall be compatible with the existing crossing control equipment.

- ii. **Warning Lights:** Warning lights shall be provided in accordance with the guidelines set forth in the following reference documents, as appropriate:
 - a. A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO);
 - b. Manual on Uniform Traffic Control Devices (MUTCD), published by U.S. Department of Transportation;
 - c. FDOT Minimum Specifications for Traffic Control Devices;
 - d. FDOT Roadway and Traffic Design Standards;
 - e. FDOT Standard Specifications for road and bridge construction;
 - f. Preemption of Traffic Signals at or near Railroad Grade Crossings with Active Warning Devices, Institute of Transportation Engineers Recommended Practice;
 - g. Standard Highway Signs, Federal Highway Administration;
 - h. American Railway Engineering and Maintenance-of-Way Association, Manual of Recommended Practices – Signals;
 - i. Manual of Traffic Signal Design, Institute of Transportation Engineers;
 - j. Highway Capacity Manual, Transportation Research Board (TRB);
 - k. Manual of Transportation Engineering Studies, Institute of Transportation Engineers;
 - l. Traffic Signal Installation and Maintenance Manual, Institute of Transportation Engineers;
 - m. CSXT Signal Standards.

- iii. **Pedestrian Protection:** Pedestrian gates utilizing the same type of gate mechanisms as the crossing gates (or scissor-type mechanisms combining vehicular and pedestrian gates) shall be provided.
- iv. **Warning Device Location Requirements:** Warning devices shall be located to comply with MUTCD, FDOT, and other applicable Governmental Rules and standards.

III.E.4 Median Barriers

It is desirable that grade crossings on the SFRC use a physical, rather than mechanical, system in lieu of four-quadrant gate or three-quadrant gate systems to provide "full closure". However, many conditions on the SFRC preclude the use of an effective median barrier system that meets the criteria for "full closure".

Median barriers, in the form of 9" non-mountable curbs with 18" gutters, shall be employed at locations where physical characteristics permit. Classification of a crossing as "full closure" shall dictate the requirements for the median barriers.

Provide crossing protection, 9" non-mountable curbs, median barriers, etc. with "full closure" requirements.

- i. **Non-mountable Curb:** Nine inch non-mountable curb shall be used as a median barrier.
- i. **Double Faced Guardrail:** Where existing crossings use double faced guardrail as a median barrier, double faced guard rail may remain in use as a median barrier.

III.E.5 Crossing Surfaces

The highway at-grade railroad crossing shall be constructed for a suitable length with all-weather surfacing. A roadway section equal to the current or proposed cross section of the approach roadway shall be carried across the crossing. The crossing surface

itself shall have a riding quality equivalent to that of the approach roadway. FDOT's Highway-Railroad Grade Crossing Material Selection Handbook shall be consulted in selecting the material.

Panel-type crossing systems shall be full-depth in all cases. For new mainline track construction, grade crossings shall be full-depth, precast concrete system, including rubber flangeway boots or inserts. Other systems, including full-depth rubber systems may be used on existing mainline and secondary tracks with approval from TRI-RAIL.

Refer to FDOT Roadway and Traffic Design Standards, Index 560 for standard details for construction of crossings.

- i. **Crossing Width:** The length of the crossing surface shall be a minimum of 2 feet wider than the adjacent travel way of the roadway and, (if present) sidewalks or shoulders on both sides of the roadway. Roadway widths across the railroad crossing area should correspond to that of the adjoining roadway with the same number and width of traffic lanes.
- ii. **Profile and Alignment:** In multiple-track crossings, the top of rails for all main tracks shall be brought to the same plane where feasible. Track and roadway super elevation and curvature shall be minimized if possible. The highway surface shall also be in the same horizontal plane as the top of rails for a distance 2 feet outside of rails for either single or multiple-track crossing.

The surface of the roadway shall not be more than 3 inches higher, or more than 6 inches lower than the top of the nearest rail at a point 30 feet from the rail, measured at right angles, unless track super elevation dictates otherwise. Railroad-highway at-grade crossing angles shall be as near 90 degrees as practicable.

The Contractor shall examine each crossing and determine the final scope and limits of Work necessary to ensure that the roadway is modified as necessary to comply with all pertinent FDOT and other highway design criteria.

III.E.6 Drainage

In all cases, sufficient evaluation and consideration shall be given to provide a crossing design that effectively removes stormwater run-off away from the crossing area. It is essential that the design results in drainage patterns that eliminate water pockets, outlets the run-off to suitable areas (storm sewers, if available, french drains, underdrains, etc.). This shall come in the form of surface ditches and/or an engineered drainage system, including track underdrains and effective outlet devices. In the design of underdrain systems, longitudinal pipes shall be considered on both sides of each track, whether in single-track, or multiple-track situations.

- i. **Spare Conduit:** Two 4 inch schedule 40 PVC conduits shall be provided at all grade crossings, with pull strings and end caps parallel with the tracks along and ten feet beyond the extreme ends of the field side of one track at a depth of 36" to 42" below bottom of tie.

III.E.7 Emergency Grade Crossings with Gates

Emergency grade crossings with an access walkway shall be provided as a means for the physically challenged to cross the track, escorted, when the elevators are not working. One emergency grade crossing with a lockable gate and an access walkway shall be provided on the North end of the platform at every non-Amtrak Station. Two emergency grade crossings with lockable gates and access walkways shall be provided at Amtrak Stations; one at each

end of the one-thousand foot long extended platform.

Crossings shall comply with the requirements of ADA, CSXT and FDOT and be a minimum width of 8'-0".

Access walkway to the Emergency Grade Crossing shall be by a concrete pavement walkway, and shall not exceed a 1:20 slope.

IV. PLATFORM ELEMENTS

Stations should provide passengers with feelings of safety and security, and reasonable measures of protection from weather. Platforms shall therefore, be provided with canopies, windscreens, and railings in accordance with the requirements of this Chapter.

IV.A. CANOPIES

Canopies shall be provided over the entire length of each platform (400'-0" minimum). In addition, canopies shall be provided at platform entrances, any platform shelter, not having its own covering, and the transition areas between platforms and stairways, elevator alcoves, overpasses, and ADA accessible ramps.

Canopies shall be configured in a manner which provides maximum protection to waiting passengers from sun, wind and rain.

Canopy structures may be single- to dual-column supported, depending on platform width and placement of certain platform elements. If a dual-column support system is utilized, columns shall be set back a minimum of 10'-0" from the platform edge.

Canopy structure (not including brackets and decoration) shall be located a minimum of 10'-4" above platform. Canopy eave height can extend below the 10'-4" height to maximize protection of passengers from wind driven rain.

Edge of canopy including gutter shall be set back 5'-0" from edge of trackside platform. Canopy width shall be 20'-0" wide for the entire length of the platform, or as feasible.

Canopy design shall assume that the rain is falling at a 30-degree angle from the vertical. Drip lines shall not be over travel pathways. Gutters and downspouts shall be designed to be vandal resistant, using steel piping and welded supports, to provide cleanouts in downspouts and to convey rainwater away from track structure.

Underside of canopy roofs shall have soffits to conceal deck fasteners, horizontal or raked per design intent.

Since the leading edge of each canopy is limited to the minimum height and horizontal offset from the platform edge delineated in the CSXT Clearance Diagram in Appendix G (both of which act to limit the canopy's sheltering effects), consideration may be given to the use of an asymmetrical design, or a symmetrical design offset from the centerline of the platform, to achieve the desired degree of weather protection.

IV.A.1 Appearance

Canopies should be architecturally harmonious with the rest of the station, and the architectural character of the surrounding community. In many cases platform canopies will be the visually dominant architectural feature of the station.

Exposed steel members of canopy structures shall, at a minimum, receive a premium paint coat. The use of applied decorative veneers, fascias, soffits, and column covers may be considered on a case-by-case basis.

Canopy roofs shall be sheathed with a material which requires minimal maintenance, such as standing seam metal. Sheathing materials shall have a premium, UV-resistant finish, factory applied.

IV.A.2 Materials and Performance

- i. Canopy structures shall conform to the design load requirements delineated in Section III.D.2.i. Structural load calculations shall additionally take into

- Standard weight welded steel pipe downspouts with high performance field applied coating



FIGURE 4.5 TYPICAL PLATFORM CANOPIES

account such items as railings, windscreens, signage, advertising panels, lighting, and PA components which may be attached to the canopy structure.

ii. Canopy Roofing/Canopy Soffit:

- Standing seam metal roofing/steel deck, galvanized; no exposed fasteners
- Cement or clay roofing tile/fire retardant treated lumber
- Factory finished extruded aluminum gutters

IV.B. WINDSCREENS

All platforms shall be provided with protection from wind-driven rain. Under severe weather conditions, platform canopies may not provide sufficient protection; the use of supplement windscreens should be considered.

When used, multiple windscreens should be provided, dispersed along the length of each platform in a manner which avoids overcrowding and facilitates evenly balanced boarding of trains. Windscreens shall not, however, be located where they might impede passenger circulation.

IV.B.1 Appearance

Windscreens shall be glazed, 3-sided structures, nominally 8'-0" in height, with a continuous 4"-high opening at the base. Glazing should not extend more than 7'-0" above the platform.

IV.B.2 Materials and Performance

Glazing shall be premium, mar-resistant polycarbonate, specially treated for UV resistance, dry-set in removable stainless steel frames.

IV.C TICKET AGENT OFFICE

IV.C.1 Program and Design Guidelines

A ticket agent office shall be provided including the following features:

- i. Room dimension 12 feet x 12 feet.
- ii. Provide increased lighting in areas outside near the ticket agent's window, and the ticket machines.
- iii. Provide a counter for passengers outside of the ticket agent's window, which meets ADA requirements.
- iv. Provide an employee bathroom accessible from the ticket agent office, and from outside for maintenance. All fixtures shall be stainless steel.
- v. Ticket selling windows to include dip tray and sliding glass opening to pass through objects.
- vi. All windows in office must have roll up doors with up/down switch inside the office, and must be bullet proof.
- vii. Ticket Agent Office entrance door must have an automatic door opener.
- viii. The office space shall have HV/AC, lighting, acoustical tile ceiling, vinyl tile floor, and painted gypsum board walls.

- ix. Ticket Agent Office must have a minimum of ten (10) electrical outlets plus data and phone outlets.

IV.C.2 Materials and Performance

- i. Materials and finishes used must be graffiti resistant.
- ii. Intercom
- iii. Ticket Agent must have the ability to make announcements through P.I.S system to passengers on platform.
- iv. Exterior door hardware lock integrated with existing ASSA key locks.

IV.D. RAILINGS

The use of railings affects several aspects of the station environment. Railings provide visual cues which help guide the passenger movement through the station, and are prominent visual elements in the overall aesthetic character of the station. In addition, they also help to ensure passenger safety and compliance with accessibility guidelines.

IV.D.1 Program and Design Guidelines

- i. **Design:** Railings and handrails shall be ADA-compliant, of uniform design throughout each station, and shall use standard manufactures components to the extent possible.
- ii. **Railings:** Railings should generally be provided in the following locations:
 - Both sides of all stairs and ramps
 - Both ends of each platform
 - Rear edges of platforms

Where practicable, parapet walls may be used in lieu of railings in limited locations.
- iii. **Handrails:** Handrails shall be provided in the following locations:
 - Both sides of all stairs and ramps

- Where overhead hazards exist, as under stairways and/or overpasses

Handrails may be provided as an integral part of the railing system, or may be separately installed, fastened to parapet walls, structures, and the like.

IV.D.2. Materials and Performance

Railings and handrails shall be of design and fabrication which conforms to referenced NFPA and ASTM Standards. Railing and handrail assemblies shall be of aluminum or stainless steel.

- Materials:** Railing assemblies shall be of welded steel, hot-dip galvanized after fabrication. Handrails shall be stainless steel, Type 304 or higher, or aluminum.
- Fabrications:** Elbows, end loops, base flanges, and similar components shall be part of a standard manufactured system.

Rigid connections shall be sleeveless, welded, and ground smooth. Connections between contiguous length of railing shall be sleeved, to permit expansion and contraction.

Railing assemblies shall be designed and fabricated to prevent passage of a 4" sphere.

Railing assemblies shall be fastened to substrates using concealed vandal-proof fasteners, or shall be cast into drilled cores in concrete slabs.

- Finish:** Railings shall receive a polyester powder coating, electro-deposited and baked to final finish.

VI.E SECURITY SYSTEM PROVISIONS

Provisions for future security systems shall be designed, furnished and installed in

order for TRI-RAIL to complete the installation of a complete operating security system at a later date for each Station.

VI.E.1 Program and Design Guidelines

Conduit, junction boxes and other built-in electrical devices and appliances required shall be provided for the future installation of the following security systems:

- Closed circuit monitoring of platforms, TVM and vending machine areas, stairs, elevators and the crossover pedestrian bridge
- Panic buttons and/or hotline telephones; remotely monitored and capable of activating on-site audible and visual alarms.
- Each Station shall be equipped with conduit and pull string, running to a telecommunications room at the Station, to accommodate future security systems.
- Locations of cameras shall be determined to maximize views within the elevators, stairs and pedestrian cross over bridge, and shall be ultimately approved by SFRTA's Safety and Security Administrator.
- Conduit and other concealed electrical devices shall be furnished and installed for the future installation of panic alarms; one in the pedestrian cross over bridge and one on each platform.



FIGURE 4.6
TYPICAL PLATFORM FENCE

IV.F PLATFORM FENCE

Platforms shall have a platform fence at the three platform edges not adjacent to the track.

The platform fence shall be a 4 feet high, 6 gauge, green or black vinyl coated aluminum chain link and post with top and bottom rail fence at grade around the platform (including Amtrak platform extension) to mandate that passengers access the platform at the approach walk. Posts shall be spaced at 10'-0" on center and set in concrete. The platform fence shall have lockable four foot wide gates at the paved walkway leading to the emergency grade crossing.

Platform fences and gates shall be added at the ends of existing platforms to prevent unauthorized access to the paved walkway leading to the emergency grade crossing.

All locks on the platform fences will be provided by SFRTA.

V. GREEN DESIGN

The following LEED prerequisites and credits apply to this Chapter. These criteria shall be implemented on each project as applicable, and as far as the budget allows. Criteria to meet each prerequisite and credit shall be in accordance to the latest version of LEED New Construction and Major Renovations.

V.A SUSTAINABLE SITES (SS)

I.A.1 SS Credit 7.2: Heat Island Effect – Roof

The intent of this credit is to reduce the heat island effect by using roofing materials that have a low reflectivity index.

V.B WATER EFFICIENCY (WE)

V.B.1 WE Prerequisite 1: Water Use Reduction

The intent of this prerequisite is to reduce water demand of the facilities by 20% when compared to a baseline, not including irrigation.

V.B.2 WE Credit 2: Innovative Wastewater Technologies

The intent of this credit is to reduce wastewater generation by reducing potable water demand of the facilities 50%, or treat 50% of the wastewater on-site.

V.B.3 WE Credit 3: Water Use Reduction

The intent of this credit is to reduce water demand of the facilities beyond the 20% required in WE Prerequisite 1.

V.C ENERGY & ATMOSPHERE (EA)

V.C.1 EA Credit 1: Optimize Energy Performance

The intent of this credit is to increase energy efficiency performance.

V.C.2 EA Credit 2: On-site Renewable Energy

The intent of this credit is to encourage use of renewable sources of energy for consumption of the station and ancillary structures.

V.C.3 EZ Credit 4: Enhanced Refrigerant Management

The intent of this credit is to support early compliance of not using refrigerants.

V.C.4 EA Credit 5: Measurement and Verification

The intent of this credit is to encourage ongoing accountability of the structure's energy consumption.

V.C.5 EA Credit 6: Green Power

The intent of this credit is to encourage the development and use a grid-source, renewable energy technology to provide a minimum of 35% of the station and ancillary structures' energy demand for a minimum of 2 years.

V.D MATERIALS & RESOURCES (MR)

V.D.1 MR Credit 4: Recycled Content

The intent of this credit is to incorporate the requirement to use recycled materials, or the recycled material content in the design and specifications.

V.D.2 MR Credit 5: Regional Materials

The intent of this credit is to encourage and increase the use of local materials by reducing impacts due to transportation.

V.D.3 MR Credit 6: Rapidly Renewable Materials

The intent of this credit is to encourage the use of rapidly renewable materials, such as bamboo, cotton, linoleum, and cork.

V.E INDOOR ENVIRONMENTAL QUALITY (IEQ)

V.E.1 IEQ Credit 4.1: Low-Emitting Materials – Adhesives and Sealants

The intent of this credit is to reduce the use of adhesives and sealants that have contaminants that are odorous, irritating, or harmful to occupants.

V.E.2 IEQ Credit 4.2: Low-Emitting Materials – Paints and Coatings

The intent of this credit is to reduce the use of paints and coatings that have contaminants that are odorous, irritating, or harmful to occupants.

V.E.3 IEQ Credit 4.3: Low-Emitting Materials – Flooring Systems

The intent of this credit is to reduce the use of flooring systems that have contaminants that are odorous, irritating, or harmful to occupants.

V.E.4 IEQ Credit 4.4: Low-Emitting Materials – Composite Wood and Agrifiber Products

The intent of this credit is to reduce the use of composite wood and agrifiber products that have contaminants that are odorous, irritating, or harmful to occupants.

V.E.5 IEQ Credit 5: Indoor Chemical and Pollutant Source Control

The intent of this credit is to reduce exposure to potentially hazardous particulates by catching dirt, providing mechanical ventilation, and exhaust.

V.E.6 IEQ Credit 6.1: Controllability of Systems - Lighting

The intent of this credit is to provide a high level of lighting, which can be individually controlled to promote comfort and well being.

V.E.7 IEQ Credit 6.2: Controllability of Systems – Thermal Comfort

The intent of this credit is to provide a thermal comfort system, which can be individually controlled to promote comfort and well being.

V.E.8 IEQ Credit 7.1: Thermal Comfort - Design

The intent of this credit is to provide a thermal comfort system, which promotes comfort and well being.

V.E.9 IEQ Credit 7.2: Thermal Comfort - Verification

The intent of this credit is to assess the thermal comfort system of the building over time.

V.E.10 IEQ Credit 8.1: Daylight and Views - Daylight

The intent of this credit is to promote daylight by connecting indoor spaces to the outdoor light.

V.E.11 IEQ Credit 8.2: Daylight and Views - Views

The intent of this credit is to promote outdoor views by connecting indoor spaces to the outdoor.

V.E.12 MR Credit 7: Certified Wood

The intent of this credit is to encourage environmentally responsible forest management, by utilizing certified wood.



END OF CHAPTER