

# CHAPTER 3

## STATION SITE



## TABLE OF CONTENTS

TABLE OF CONTENTS.....	1
I.A PURPOSE.....	1
I.B GOALS AND STRATEGIES .....	1
<i>I.B.1 Creation of a safe, secure, and comfortable environment .....</i>	<i>1</i>
<i>I.B.2 Expression of TRI-RAIL’s place in the community .....</i>	<i>1</i>
<b>I. DESIGN INTENT .....</b>	<b>1</b>
<i>I.B.3 Provision of a clear, readily identifiable internal circulation system .....</i>	<i>2</i>
<i>I.B.4 Establishment of a Civic Presence.....</i>	<i>2</i>
<i>I.B.5 Facilitation of Maintenance.....</i>	<i>2</i>
<i>I.B.6 Anticipation of Future Growth.....</i>	<i>2</i>
I.C INTEGRATION.....	2
I.C.1.....	2
I.C.2 Land Use .....	2
I.C.3 Relationship to Public and Private Spaces .....	2
I.C.4 Visual Connections.....	2
I.C.5 Property Development.....	3
I.C.6 Provisions for Infrastructure and Access.....	3
I.C.7 Site Selection.....	3
II.A STATION SITE ACCESS / IDENTIFICATION .....	4
II.A.1 Motor Vehicle Access.....	4
II.A.2 Bicycle Access .....	4
II.A.3 Pedestrian Access .....	4
<b>II. VEHICULAR AND PEDESTRIAN MODES .....</b>	<b>4</b>
II.B VEHICULAR CIRCULATION.....	5
II.B.1 Program and Design Guidelines .....	5
II.B.2 Design, Materials and Performance .....	6
II.C PEDESTRIAN CIRCULATION.....	7
II.C.1 Bus Shelter .....	7
II.C.2 Program and Design Guidelines.....	7
II.C.2 Design, Materials and Performance .....	8
II.D ENTRANCES .....	8
II.D.1 General Considerations .....	8
II.E STAIRS AND RAMPS.....	9
II.F INTERMODAL TRANSFER.....	9
II.G PARKING .....	9
II.G.1 Design Criteria.....	10
II.H BICYCLE ACCESS & STORAGE.....	10
FIGURE 3.2 TYPICAL BIKE LOCKERS .....	11
II.J MOTORCYCLE PARKING .....	11
II.L ALTERNATIVE / LOW FUEL CONSUMPTION PREFERRED PARKING.....	12
III.A MINIMUM REQUIREMENTS.....	13
III.B PLANTINGS .....	13
III.B.1 Material Selection Strategy .....	13
<b>III. LANDSCAPE .....</b>	<b>13</b>
III.B.2 General Design Strategies .....	14
III.B.3 Categories of Plant Materials.....	14
III.B.4 Existing Plantings.....	15
III.C IRRIGATION.....	16

III.C.1 General Criteria.....	16
IV.A GENERAL.....	18
IV.B DESIGN CRITERIA .....	18
IV.B.1 Materials and Performance.....	18
IV.B.2 Parking Areas .....	18
<b>IV. HARDSCAPE.....</b>	<b>18</b>
V.A RETAINING WALLS.....	20
V.A.1 Program and Design Guidelines .....	20
V.A.2 Appearance .....	20
V.B FENCING .....	20
V.B.1 Appearance .....	20
V.B.2 Materials and Performance.....	20
V.C BOLLARDS.....	20
<b>V. MISCELLANEOUS .....</b>	<b>20</b>
<b>SITE FEATURES.....</b>	<b>20</b>
V.D SCREENING .....	21
V.D.1 Appearance .....	21
V.D.2 Materials and Performance .....	21
V.E SITE LIGHTING .....	21
V.E.1 General .....	21
V.E.2 Station Site Lighting.....	21
V.E.3 Pedestrian Access Lighting .....	21
V.E.4 Landscaping.....	21
VI.A SUSTAINABLE SITES (SS) .....	22
VI.A.1 SS Credit 1: Site Selection .....	22
VI.A.2 SS Credit 2: Development Density and Community Connectivity .....	22
VI.A.3 SS Credit 4.1: Alternative Transportation – Public Transportation Access .....	22
VI.A.4 SS Credit 4.2: Alternative Transportation – Bicycle Storage and Changing Rooms.....	22
VI.A.5 SS Credit 4.3: Alternative Transportation – Low-Emitting and Fuel-Efficient Vehicles.....	22
VI.A.6 SS Credit 4.4: Alternative Transportation – Parking Capacity .....	22
VI.A.7 SS Credit 5.1: Site Development – Protect or Restore Habitat .....	22
VI.A.8 SS Credit 6.1: Stormwater Design – Quality Control.....	22
VI.A.9 SS Credit 6.2: Stormwater Design – Quality Control.....	22
VI.A.10 SS Credit 7.1: Heat Island Effect – Nonroof.....	22
VI.A.11 SS Credit 7.2: Heat Island Effect – Roof.....	22
<b>VI. GREEN DESIGN .....</b>	<b>22</b>
VI.A.12 SS Credit 8: Light Pollution Reduction .....	23
VI.B WATER EFFICIENCY (WE) .....	23
VI.B.1 WE Prerequisite 1: Water Use Reduction .....	23
VI.B.2 WE Credit 1: Water Efficient Landscaping.....	23
VI.B.3 WE Credit 3: Water Use Reduction.....	23
VI.C ENERGY & ATMOSPHERE (EA).....	23
VI.C.1 EA Credit 1: Optimize Energy Performance .....	23
The intent of this credit is to increase energy efficiency performance. ....	23
VI.C.2 EA Credit 2: On-site Renewable Energy.....	23
VI.C.3 EA Credit 6: Green Power .....	23
IV.D MATERIALS & RESOURCES (MR) .....	23
VI.D.1 MR Credit 4: Recycled Content.....	23
VI.D.2 MR Credit 5: Regional Materials .....	23

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*VI.D.3 MR Credit 6: Rapidly Renewable Materials*.....23  
*VI.D.4 MR Credit 7: Certified Wood* .....23

## I. DESIGN INTENT

### I.A PURPOSE

The expansion of TRI-RAIL in South Florida will inevitably have significant positive impacts on the communities it serves. In addition to enhancing mobility within the region, expansion of the transportation infrastructure presents additional opportunities for property development. The design of TRI-RAIL facilities, therefore, must facilitate the achievement of parallel goals – enrichment of the existing environment within each community, and improvement of the “travel experience” throughout the region.

The standing of transportation facilities and associated property developments within their respective communities, tend to evolve over time; railroad station often emerge as local landmarks, or in certain cases, community gateways. Therefore, appropriate design measures should be taken, to ensure that TRI-RAIL facilities are viewed as positive additions to their respective communities.

While regional passengers may assume that everything associated with riding the train is related to TRI-RAIL, this is often not the case. For example, parking areas and access roadways are often under the control of municipalities or private entities. These situations, however, are opportunities for TRI-RAIL to work in concert with communities and appropriate private partners, to enhance the complete travel experience for commuters and occasional travelers alike.

This Chapter addresses issues of Planning and environmental quality for those

elements and areas which collectively make up station sites.

### I.B GOALS AND STRATEGIES

Site layouts and amenities for all TRI-RAIL facilities, whether entirely new construction or modifications to an existing facility, shall be designed to improve the perception of TRI-RAIL as a customer-oriented community asset, and shall facilitate achievement of the following goals:

#### I.B.1 Creation of a safe, secure, and comfortable environment

- i. All areas should be open and unobstructed to discourage theft, vandalism, etc.
- ii. Where feasible, plantings selected for scale, color, texture, form or fragrance should be included to enhance the overall station environment.

#### I.B.2 Expression of TRI-RAIL’s place in the community

- i. Site entrances and exits should be clearly identified through design, with the help of signage and decorative landscaping.
- ii. Local traditions shall be respected, as applicable. Historic relics, heritage trails, and existing landscape features should be preserved, and incorporated in the new development where possible.
- iii. Trailblazing signage shall be placed in the respective communities to direct passengers to stations.

### I.B.3 Provision of a clear, readily identifiable internal circulation system

- i. Customers should be able to quickly figure out where they need to go, and reach their destination easily.
- ii. Use of different materials, patterns, colors, or textures should be considered, to help distinguish between various circulation paths (i.e., pedestrian, bicycle, or vehicular).
- iii. Traffic within the station site should be organized by function, and assigned to clearly designated areas; such as waiting areas, passenger drop-off, kiss-and-ride areas, taxi stands or lanes, bus stops, and others.
- iv. Appropriate signage should be provided within the station site to direct passenger and vehicular movements.

### I.B.4 Establishment of a Civic Presence

- i. Station sites may be designed with special areas as planting beds, plazas, etc., that encourage community and civic groups to “adopt a station”.
- ii. The design of the site should relate to key characteristics of the surrounding community, such as historical, or other unique architectural features.

### I.B.5 Facilitation of Maintenance

- i. Site furnishings should be durable, standard manufactured items, with parts and replacement items readily obtainable, preferably from local sources.
- ii. Plantings should be native to South Florida, which require minimal maintenance, and survive with minimum irrigation.

### I.B.6 Anticipation of Future Growth

- i. Site planning should take into consideration the probable future

needs of TRI-RAIL, and the potential for development of adjacent properties. Where possible, station site designs should allow for future expansion with minimal disruption to existing facilities and services.

## I.C INTEGRATION

The relationship between TRI-RAIL facilities, adjacent developments, and the surrounding community will be articulated through the creation and maintenance of visual and functional connections, and consideration of the following:

### I.C.1 Local Planning Regulations

Conforming to the requirements of local planning regulations, even in instances where TRI-RAIL is exempt from such provisions, will ensure that development of TRI-RAIL facilities supports community desires for quality of life in the built environment.

### I.C.2 Land Use

Land use is determined, in large part, by economic considerations. Site planning for TRI-RAIL facilities should emphasize efficient use of this irreplaceable resource.

### I.C.3 Relationship to Public and Private Spaces

Relationships between TRI-RAIL facilities, other public spaces, and private spaces should be expressed through the use of transition spaces such as entry courts.

### I.C.4 Visual Connections

Station facilities should be designed with some degree of transparency, to maintain visual access between the facilities and the public way, and to foster a sense of liveliness and security.

### I.C.5 Property Development

TRI-RAIL station facilities may be intended to accommodate property development adjacent to the facility, over the facility, or both. From a community standpoint, it may be desirable for areas close to stations (and over the stations, where applicable) to be developed to their optimum potential due to the high level of accessibility afforded by TRI-RAIL.

Hence, when planning TRI-RAIL facilities, an important consideration shall be to avoid “sterilization” of the land, which might render it unsuitable for further or adjacent development.

### I.C.6 Provisions for Infrastructure and Access

- i. Where directed, the design of TRI-RAIL stations may include provisions to ensure that other suitable property development is facilitated, through inclusion of the following:
  - Columns and foundation structures
  - Utilities, services, and drainage
  - Park-and-ride facilities
  - Roadways and other access
- ii. In some cases, provisions for future development through enabling works may need to be carried out while the station is under construction.
- iii. In other cases, a third party property developer may be involved at an early stage. In such cases, construction of foundations, podiums, roadways, and other features may proceed concurrently with construction of the station and railway.

### I.C.7 Site Selection

Shall be done following Green Design guidelines in Section VI of this Chapter.

## II. VEHICULAR AND PEDESTRIAN MODES

### II.A STATION SITE ACCESS / IDENTIFICATION

Train stations occur in several different contexts, ranging from the inner city to small town residential neighborhoods. Consequently, the way passengers arrive at a particular station may vary considerably.

Many customers drive to the station, park their cars, and walk to the station platform, while others arrive by taxi, bus, or foot. When planning individual station sites, proper consideration of how customers will get to the station should be given.

#### II.A.1 Motor Vehicle Access

- i. **Location:** The primary vehicular access shall be located in a manner which is clearly identifiable, and in a logical relationship with the local roadways.

Entrances shall be located as far as practical from conditions which might impact traffic safety.

In certain cases, local conditions and/or anticipated traffic generated by a station, may warrant the need of a traffic signal or special signage to control traffic at the main entrance. Traffic control requirements shall be reviewed with the appropriate municipal authority.

- ii. **Configuration:** The size and location of a station entrance shall be based on anticipated peak-hour traffic volumes, for access and egress, as well as the alignment and configuration of adjacent public roadways.

Where feasible, the alignment of a station entrance and exit should intersect at a 90° angle with the alignment of the connecting road.

Ingress and egress driveways shall have a minimum inside turning radius of 35 feet, to allow large emergency and/or service vehicles (such as fire trucks or trash haulers) to enter and exit the site easily. This minimum turning radius may vary per the local municipality's land development code.

In some instances, municipal buses may also enter the site. If the size of the station site can accommodate bus service, and there is frequent bus circulation to the station site, then dedicated bus access shall be considered.

In cases where peak-hour demand, and local traffic conditions warrant, multiple dedicated separate entrances for buses may be considered if site dimensions and conditions allow it.

#### II.A.2 Bicycle Access

Stations should be designed to encourage the use of bicycles as an alternative to motor vehicles to access the station site.

- i. **Configuration:** If significant bicycle traffic is expected, dedicated circulation paths for bicycles should be considered.

Bicycle pathways should be delineated with appropriate signage and pavement markings, and should terminate at, or near provided bicycle parking/storage areas.

#### II.A.3 Pedestrian Access

Pedestrian and vehicular traffic patterns are not necessarily the same. Foot traffic in the areas surrounding the station should be analyzed to identify established paths and/or destinations, and determine whether and opportunity exists for the station to incorporate the established patterns.

- i. **Configuration:** In some cases, the primary pedestrian path will consist of

a sidewalk, adjacent and parallel to the vehicular main entrance. Separation between the sidewalk and the access road may be by a curb, or a paved/landscaped buffer zone.

Where local site conditions permit, the pedestrian access route should be protected from the vehicular access route. This may be achieved through the use of non-parallel barriers, buffers, fences, walls or any combination thereof.

Certain sites may accommodate the provision of pedestrian access from multiple directions. Often true for stations located in central business districts, this may also apply to sites which border residential neighborhoods. Opportunities to provide secondary access, frequently less formal than the primary pedestrian access point, should be considered on a case by case basis.

Regardless of configuration, pedestrian access routes shall be well lit, and clearly visible from station platforms and the public right-of-way.

## II.B VEHICULAR CIRCULATION

Vehicular traffic can get fairly complicated at train stations, as various types and sizes of vehicles enter the station site for different purposes. Private cars, buses, taxis, and vans arrive to pick-up or drop-off passengers, while motorists and cyclists arrive at the station to use the parking facilities. Furthermore, and occasional emergency or service vehicle must be able to pass to respond to a crisis, make deliverables, or collect refuse.

### II.B.1 Program and Design Guidelines

- i. Pedestrian movement at the Stations shall be standardized in order for the pedestrians to have a familiar route to

follow. The relationships between approach walk, entry, Ticket Vending Machines (TVMs) and directional signage, vertical circulation and crossover pedestrian bridge shall establish a direct and convenient route, similar at each Station. Three distinct groups shall be considered in the design of pedestrian movement:

- a. Regular commuters;
- b. Infrequent users; and
- c. Individuals with disabilities.

The three groups move through the system in varying ways. Regular commuters move quickly with a minimum of guidance; infrequent users move easily with great reliance on signs for guidance; and individuals with disabilities move slowly with the guidance required depending on the frequency of use and the degree of the disability. The following general principles shall be employed to accommodate these varying demands:

- a. Location of signage shall be consistent at all Stations.
- b. Right-hand flows are the norm, and therefore desirable.
- c. Stations shall be designed to promote direct and safe pedestrian movement.
- d. Grade changes shall be avoided, and where they are necessary, they shall comply with ADA, TRI-RAIL, Amtrak, CSXT and FDOT requirements.
- e. Surge and queuing spaces shall be provided ahead of every change in circulation, direction, or mode, and in front of TVM installations.
- d. No obstructions shall be within the main pedestrian flow, which is

defined as a five-foot clear strip along the track side of the platform.

- e. Circulation elements shall use color, lighting, texture and sight distances to best advantage to increase visual clarity, guidance, passenger safety, and security.
  - f. Ramps shall be used as access for individuals with a disability to accommodate minor changes in grade.
- ii. Traffic patterns for new stations should be organized in accordance to a clear hierarchy, which minimizes conflict between users. While pedestrians should receive the highest priority, passenger pick-up/drop-off areas, park-n-ride, and bicycle traffic must all be accommodated. Depending on the size and location of the station, the priority assigned to each of these modes may vary.
  - iii. For reconfiguration of existing stations, opportunities to minimize conflicts may be limited, although access modes and priorities may actually be better defined, through existing activities and prior experience. In such cases, the design focus should be on the refinement of existing access patterns.

#### II.B.2 Design, Materials and Performance

Design and materials selection for vehicular circulation facilities shall be in accordance with appropriate FDOT, ITE, and AASHTO design standards.

- i. **Paved Surfaces:** Roadway and parking area surfaces should be non-reflective in wet weather.

Unless specific conditions dictate otherwise, paving shall be bituminous asphalt (blacktop) on appropriate base and subgrade courses. More durable surface may be considered where

heavier loads are anticipated, such as bus routes.

Edges of paved areas shall be neatly finished, preferably through the use of curbs. Where curbing is not used, paved surfaces shall meet adjacent grades smoothly, ensuring that no tripping hazard is created.

Lane dividers and other markings shall be of reflective, ITE-compliant materials, which have suitable slip resistance when wet.

- ii. **Curbing:** Curbing should be provided to maintain a vertical edge between the tops of paved areas and adjacent surfaces. Use of curbing is also desirable to separate paved surfaces from adjacent landscaped areas.

Curbing shall be of cast-in-place concrete, except in limited instances, where precast curbing of granite or manufactured cast stone may be used. Curbing should present a neat edge to paved areas, with the vertical exposure of the curb varying by no more than 1" over any continuous length of curb.

- iii. **Crosswalks:** Crosswalks should be provided where designated pedestrian routes must cross a vehicular path.

Crosswalks should be clearly visible to both pedestrian and motorists, and shall be delineated by signage and striping (90° or 45° 12" wide with 24" clearance) on the paved surface, a change in paving material, or both.

Pedestrian crosswalks shall be 8 feet wide, 5 feet minimum. In locations where bus or shuttles stop to pick-up/drop-off passengers, the minimum clearance for the sidewalk shall be 8 feet.

- iv. **Fire Lanes:** Roadways and parking areas shall be configured with adequate clearances to allow access by

emergency vehicles to station buildings, where used, and to pedestrian overpasses.

- v. **Bus / Shuttle Bus Lanes:** In locations where separate circulation is available for buses and shuttle buses, a minimum bus bay lane of 12 feet shall be provided, with an adjacent bus thru lane of 15 feet minimum width.

Where the configuration of the site allows, bus bays shall have a “saw-tooth” configuration; otherwise, a continuous linear bus and shuttle bus bay area shall be provided adjacent to a raised sidewalk.

Bus and shuttle bus bays shall have a minimum length of 400 feet, or accommodate a minimum of four (4) buses. These minimum requirements may change if a station is considered a main transfer station, or if it is part of a TOD or an intermodal center.

- vi. **Kiss-n-Ride and Taxis:** In locations where separate circulation is available for Kiss-n-Ride and taxis, a minimum drop-off / pick-up lane of 12 feet shall be provided, with an adjacent vehicle thru lane of 15 feet minimum width.

When Kiss-n-Ride and taxi lanes are adjacent to bus and shuttle bus lanes, there shall be a raised sidewalk to separate the flow of traffic. Raised sidewalk shall have a width of 8 feet with traffic protection (such as a jersey wall) along the entire length of the sidewalk, except where there is a crosswalk. At no time shall the sidewalk width be less than 5 feet.

Kiss-n-Ride and taxi lanes shall have a minimum length of 150 feet each, or a total available length of 300 feet. These minimum requirements may change if a station is considered a main transfer station, or if it is part of a TOD or an intermodal center.

## II.C PEDESTRIAN CIRCULATION

Pedestrian movements within station sites should be clear, direct, and segregated from vehicular traffic to the extent practicable.

### II.C.1 Bus Shelter

Bus shelters shall provide protection from rain and sun for waiting passengers. Bus shelters shall be located within close proximity of the Station covered entrance or covered platform access area, and within the bus drop-off lane.

### II.C.2 Program and Design Guidelines

Pedestrian circulation within a station site is classified as having primary and secondary pathways.

- i. **Primary Pathways:** Fully accessible routes which will be used by a majority of customers to access the station site and circulate among its constituent elements.
- ii. **Secondary Pathways:** Alternate routes that link minor access points with platforms, or with primary pathways.  
  
By definition, each station will have at least one primary pathway, although the exact number and location of pedestrian routes must be determined on a case by case basis. Pathways will also be impacted by station utilization and site conditions.
- iii. **Critical Design Criteria:** The width, slope, and grade of all primary pathways shall be in accordance with current ADA Accessibility Guidelines and other applicable standards.

Secondary pathways in new construction, and where conditions permit in renovation and reconstruction, should also be ADA compliant. However, should site constraints so dictate, minor deviation from standards may be considered.

### II.C.2 Design, Materials and Performance

Pedestrian pathways shall be constructed of durable, slip-resistant materials which are easy to maintain.

- i. **Pathway Surfaces:** Continuous, nominally level, and uninterrupted by abrupt changes in grade or pitch.

Use of differing paving patterns and textures to delineate routes is encouraged, and may be achieved through variations in scoring and finishing of concrete, or by selective use of materials having differing color or texture.

Patterns and textures used shall not impede wheelchair use, or present an uncomfortable walking surface.

- ii. **Materials:** Cast-in-place concrete shall be the predominant material used for pedestrian pathways.

Accessory materials, such as brick pavers, precast concrete, natural stone, or cast stone elements may be used to provide desired variations in color and texture, subject to the following:

- a. Materials shall conform to stated criteria for durability, slip-resistance, and ease of maintenance.
- b. Materials used for color variation shall be integrally colored throughout, so that no “color scar” will be visible, should the material become chipped, cracked, or damaged otherwise.
- c. Color variation in concrete surfaces shall be achieved exclusively through the use of inlaid materials of contrasting color.

**Under no circumstances shall coloring or tinting of cast-in-place concrete, whether through the use of integral**

**pigmentation or applied coatings, be permitted.**

### II.D ENTRANCES

Entrances are transitional areas which provide links between platforms, parking areas, and other station elements, as well as between the station site and the public right-of-way. Their design shall be spacious and inviting, in harmony with their surroundings, and shall take advantage of available views and sight lines to surrounding neighborhoods.

#### II.D.1 General Considerations

- i. **Location:** Entrance locations will generally be governed by the availability of land and by functional considerations. Where practical, entrance locations should serve as extensions of established pedestrian circulation patterns within the neighborhood.
- ii. **Capacities:** Entrance capacities shall be sufficient to support both normal peak-hour circulation and emergency evacuation volumes. In some cases, dedicated emergency egress, which is not part of the normal circulation system for passengers, may be necessary.
 

Shared or other entrances which lead to areas under the control of entities other than TRI-RAIL shall not be counted when calculating required emergency evacuation capacity.
- iii. **Configuration:** Entrance designs shall be free of impediments to pedestrian circulation which reduce the effective capacity of the entrances.

Once inside an entrance, the use of steps shall be avoided to facilitate passenger flow, particularly for the elderly and those with heavy luggage or bulky packages.

iii. **Weather Protection:** Entrances shall offer some measure of protection from weather. Where entrances are free-standing, they shall have a canopy that completely covers the entrance. Free-standing entrance canopies shall be compatible in design with their surroundings.

iv. **Entrances Connected to Other Structures:** Entrances which pass through, connect or attach to other structures shall include 4-hour, fire-rated separation from such occupancies.

The line of demarcation between TRI-RAIL property and other properties shall be clearly delineated in the design.

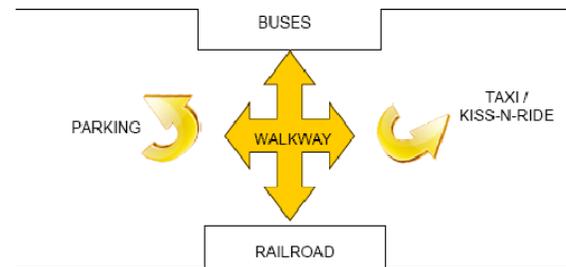
## II.E STAIRS AND RAMPS

Stairs and ramps shall be designed in accordance with the guidelines delineated in Chapter 4.

## II.F INTERMODAL TRANSFER

Several TRI-RAIL stations feature connections with other types of public transportation, such as buses, taxis, rapid transit, and airport shuttles. Station site designs should accommodate and encourage use of these connections.

- a. Intermodal transfer points must be clearly delineated. Pedestrian access routes to buses, taxis, and rapid transit connections should be as clear and direct as possible.
- b. Signage on platforms and other parts of the station should direct customers to their desired connections; where appropriate, visual symbols and/or logos of the agencies providing connecting services should be used.



**Figure 3.1 Typical Intermodal Circulation Schematic**

- c. Transfer points should include facilities for disseminating information regarding other agencies' services, including schedules, maps, route indicators, and the like.
- d. Where local bus service is provided, the access path from the bus stop to platforms shall be accessible, in accordance with ADAAG and Florida Building Code. If the bus stop is not located within the station site, cooperation with the appropriate municipal authorities may be necessary to establish an accessible route.
- e. Intermodal pick-up/drop-off areas should be located as near as practicable to station buildings, and principal platform access, and should be underneath, or immediately adjacent to, a protective canopy. Please refer to **Figure 3.1** for a Typical Intermodal Circulation Schematic.

## II.G PARKING

Parking will be provided at most stations, generally at street level. Only where there is high demand for parking or, available space is severely limited, may construction of a parking structure be considered. For design guidelines of parking structures, please refer to Chapter 9.

Parking areas should be safe, attractive and convenient, taking full advantage of the

site's potential. Parking layouts should maximize capacity, efficiency, and access.

### II.G.1 Design Criteria

- i. **Aisle Direction:** Layout of aisles should minimize the need for pedestrians to cross parking rows to reach platforms and other station facilities.
- ii. **Angle of Parking:** Standard 90° parking is preferred.
- iii. **Stall Dimensions:** 9'-0" wide by 18'-6" long preferred; 8'-6" wide by 18'- 0" long minimum. Other sizes may have to be accommodated per the local municipality land development code.
- iv. **Wheelstops:** Wheelstops present obstacles to parking area cleaning and maintenance. Consequently, wheelstops should be used only where vehicle overhang must be controlled to prevent obstruction of an accessible path, or damage to a structure. Wheelstop locations must be in accordance to the local municipality land development code.
- v. **Accessible Parking:** Parking designated for persons with disabilities shall be designed in accordance with ADAAG, Florida Building Code and located as close to station buildings and platform entrances as possible.

An accessible path to station buildings and platform entrances, walking or wheeling behind parked vehicles, which does not require crossing roadways, shall be provided for each accessible parking space.

Ramps for vertical transition to accessible paths, if required, shall be located within the delineating curb line.

- vi. **Landscaping:** Landscaping installed in parking lot medians shall be in accordance with the guidelines of this Chapter, as well as the local municipality land development code.

- vii. **Dedicated Parking:** There shall be a minimum of 3 parking spaces dedicated to Tri-Rail staff, with signage indicating SFRTA security, station agent, and maintenance.

Please refer to **Figure 3.3** for a Typical Parking Space Detail.

## II.H BICYCLE ACCESS & STORAGE

Bicycle access and storage facilities shall be provided at each station.

Bicycle parking may be provided by the installation of inverted "U" racks, or bicycle lockers

### II.H.1 Program and Design Guidelines

- i. **Vehicle/Cycle Interface:** Design of bicycle access routes shall minimize the potential for conflicts between bicycles and motor vehicles.
- ii. **Safety:** Bicycle access routes shall be designed to promote public safety; routes that are near steps or curbs, or are hidden from public view, shall be avoided.
- iii. **Configuration:** Access routes should pass through uninterrupted corridors to access station bicycle parking and/or storage facilities.
- iv. **Parking:** Bicycle parking shall be provided for a minimum of 40 bicycles, and shall be located on a concrete pad near each sidewalk approach, which does not interfere with the pedestrian flow, and is protected for vehicular traffic.



**FIGURE 3.2 TYPICAL BIKE LOCKERS**

**v. Pedestrian/Cycle Interface:** Bicycle paths and storage facilities shall be located within view of station entrances. Facilities shall not obstruct pedestrian walkways, and should be detectable to the visually impaired by means of paving, curbs, or railings.

bicycle lockers should be provided. Lockers shall be of sturdy construction, weatherproof and UV-resistant finish, mounted on level concrete pads.

Where practical, some form of weather protection should be provided for bike racks and/or storage lockers.

An average of 40 bicycle lockers shall be provided at each station.

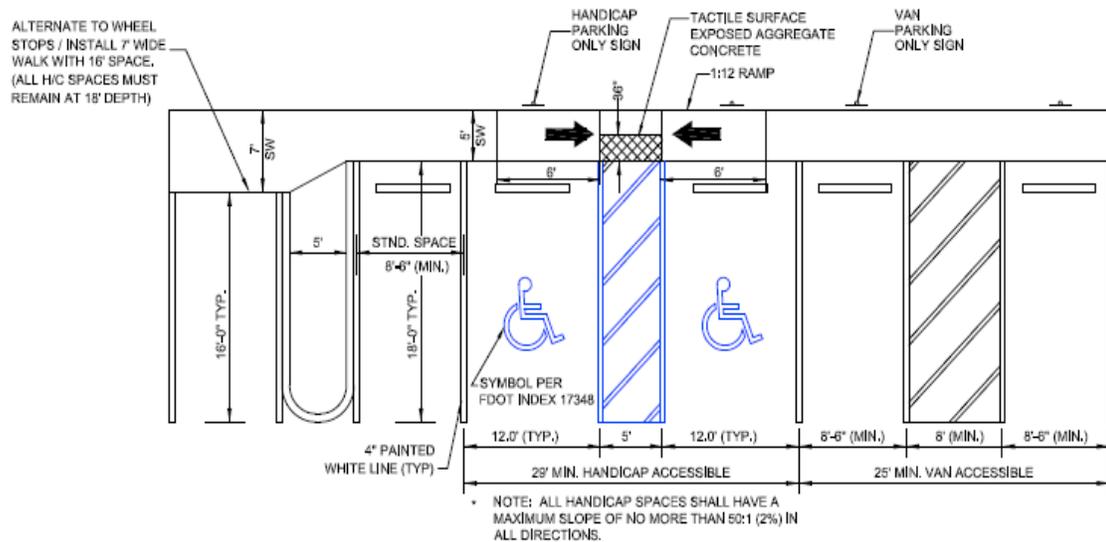
Bike lockers shall be installed on a 4-inch, reinforced concrete pad.

Bicycle Lockers are to be perforated so that the inside is visible.

Padlocks are to be used instead of an integrated lock system.

Lockers are to be placed within the corridor and not in the parking area.

**Figure 3.3 Typical Parking Space Detail**



**vi. Storage Equipment:** Minimum bicycle storage accommodations shall consist of standard bicycle racks, which allow the two wheels and the frame to be secured to the rack.

In station sites where sufficient demand exists, or may exist in the future,

**II.J MOTORCYCLE PARKING**

Motorcycle parking shall be provided at each station. For every 75 regular vehicle parking spaces, 5 motorcycle parking spots shall be provided.

Motorcycle parking spaces shall be 4'-8" wide by 12' deep, and shall have posts embedded in the ground or adjacent wall to secure motorcycles in place.

Motorcycle parking shall be indicated by signage and pavement striping.

#### **II.L ALTERNATIVE / LOW FUEL CONSUMPTION PREFERRED PARKING**

Preferred parking may be provided for alternative fuel vehicles, vehicles that consume low fuel, and low emitting vehicles. To determine the proper number of parking spaces to be provided, please refer to **Section VI Green Design** of this chapter.

### III. LANDSCAPE

The primary goals of landscaping TRI-RAIL sites are as follows:

- a. Minimize the visual impact of the railway
- b. Unify and establish a positive image for the system; and
- c. Help integrate TRI-RAIL facilities with those of the surrounding community.

Secondary goals include the following:

- a. **Site Organization:** To reinforce the site organization inherent in the design of each facility.
- b. **Environmental Benefits:** With emphasis on provision of shade and relief from the sun.
- c. **Visibility:** To maintain visibility throughout the station site, enhancing security and pedestrian/vehicular circulation.
- d. **Ease of Maintenance:** To provide landscape that is sustainable, and that requires minimum maintenance and irrigation.

#### III.A MINIMUM REQUIREMENTS

Landscape and irrigation design shall comply with local code. In addition, the following referenced standards and guidelines apply:

- Grades and Standards for Nursery Plants by the Florida Department of Agriculture and Consumer Services
- Bailey's Standard Encyclopedia of Horticulture.

- Standard Plant Names, American Joint Committee on Horticulture Nomenclature (AJCHN).
- Xeriscape Plant Guide II by the South Florida Water Management District
- Plant the Right Tree in the Right Place, South Florida as published by Florida Power and Light.

#### III.B PLANTINGS

Landscape plantings shall be in accordance with the local municipality's land development code.

Landscaping at the stations shall encompass and contain:

- Embankments and earthworks for the purpose of shape and drainage;
- View corridor and site line preservation;
- Planting for boundary treatment;
- Planting for parking lots;
- Defining the pedestrian and vehicular entrances by use of plant material;
- The enhancement or screening of Stations and ROW alignment;
- Conservation of the indigenous flora and fauna and wetlands;

##### III.B.1 Material Selection Strategy

Moderate to fast-growth plants, rather than very-fast-growth, shall be used since these produce a sturdier branching structure and better resist wind damage.

- i. Plantings shall be used to strengthen the visual quality of the Station areas and to integrate them with their surrounding environment.

- ii. The use of plant materials shall enhance historic buildings. They shall also be used to reinforce the setting of the Stations in the urban space, softening the transition from building to site where desirable.
- iii. Planting within the areas encompassed by the Project shall include only materials that are suitable for planting zone 10.
- iv. The selection and placement of the plant material shall conform to the Xeriscape principles as stated in the SFWMD Xeriscape Guide II.
- v. Local municipal codes (City and County) must be consulted prior to developing the plant palette for a Station.
- vi. All plantings must be specified as Florida Number 1 or Florida Fancy.
- vii. Plant species shall be chosen to require minimal maintenance. Plant materials with excessive fruit or leaf drops shall not be used adjacent to pedestrian areas.
- viii. At least 60% of the plant material shall be of a species native to South Florida

### III.B.2 General Design Strategies

- i. **Entrances:** Distinctive planting materials shall be used around the various entrances and transition areas in a station. These materials articulate those areas within the context of their surroundings, thus supporting convenient transfer of passengers between other modes of transportation.
- ii. **Pedestrian Paths:** Landscape shall also be used as a barrier to guide passengers to the designated crossings, ramps, sidewalks, and shall be designed to prevent creating pedestrian paths through the landscape areas.

- iii. **Planters:** Where space allows, raised planters, trees, and other design features may be integrated with seating areas, and coordinated with various elements of hardscape.
- iv. **Right-of-Way Sections:** Intrusion of landscaping on the right-of-way shall be kept to a minimum by earth shaping and planting. Attention shall be given to location and future height of trees, so that uprooting or damage will not affect the safe operation of the railway.
- v. Borders of ground cover and shrubs that require significant maintenance are to be kept to a minimum, and expansive lawn areas are to be avoided.

### III.B.3 Categories of Plant Materials

- i. **Pedestrian Areas:** Refined trees suitable for pedestrian spaces, including:
  - a. Flowering
  - b. Deciduous, and
  - c. Specially shaped specimens
- ii. **Circulation Areas:** Trees in circulation areas should be consistent with those found on existing streets within the community.
- iii. **Parking Areas:** Shade trees, which:
  - a. Help reduce the harshness of asphalt paving, and
  - b. Reduce Heat Island Effect
  - c. Contrast with circulation trees
- iv. **Columnar Plantings:** Where planting strips are too narrow, or where broad-headed trees would interfere with visibility and/or traffic, a columnar plant may be used.
- v. **Shrubs and Ground Cover:** Shrubs and ground cover shall be planted where necessary for erosion control, and for

articulating and screening activity areas.

Where shrubs are used, they shall be selected and grouped in a manner to minimize maintenance. Visibility throughout Stations shall not be compromised by the use of shrub material.

Ground cover shall be used in landscaped areas and slopes where pedestrian activity is to be discouraged.

- vi. Minimum caliper of shade trees located in paved pedestrian areas shall be four inches. Minimum caliper of shade trees in unpaved areas shall be three inches. Minimum height of shade trees shall be a minimum of twelve (12) feet by six (6) feet of spread. Small trees shall be a minimum of eight (8) feet in height by four (4) feet of spread. All palms groupings shall be staggered heights with a minimum overall height of sixteen (16) feet. Trees and palms shall be spaced an appropriate distance apart depending on the species and design intent.

#### III.B.4 Existing Plantings

- i. **Retained Plantings:** Existing plantings to be retained shall be surveyed and indicated on the Contract Drawings.
- ii. Proposed grades and slopes shall be adjusted to maximize preservation of existing trees which do not constitute a right-of-way hazard.

Where grading adjustments are not feasible, existing trees shall be preserved by use of tree wells or retaining walls, to avoid smothering the roots in fill areas, or by removal of the roots in cut areas.

All trees to be preserved shall be indicated on the Contract Drawings. Grading plans shall be reviewed to

ensure compatibility with landscape plans.

#### iii. **Removal of Existing Landscaping:**

Where it is necessary to disturb or remove existing vegetation, whether on SFRTA/FDOT property or on privately owned property, particular care shall be exercised in the preparation of grading plans to ensure retention of as many worthy existing trees as possible.

Grading plans shall be reviewed in the field. Each circumstance shall be investigated, and an appropriate solution recommended, as follows:

- a. *Removal with Compensation:* Trees to be removed from property not owned by SFRTA or FDOT, but which interfere with the construction or operation of the railway, shall be assessed by a qualified arborist and an equitable dollar value paid to the owner.
- b. *Protection of Plant Material in Place:* Plant material identified as being of value to the design shall be preserved on site, and shall have proper protection during the entire construction period. Protective barriers shall be provided at the drip line of trees where necessary to protect trees from damage by heavy equipment during construction. Care of existing trees and groupings shall be included.
- c. *Relocation of Plant Material:* No tree over 12" caliper shall be removed and relocated, except in cases of historic significance, rarity of type, excellence of form, or other special consideration.
- d. *Removal of Plant Material to Stockpile Area:* Plant materials which cannot be retained in their existing location, but have value in

another location, may be designated as stockpile material. This material shall be removed at the direction of a landscape architect, and stored in approved holding areas. Types of material suitable for such treatment include medium and small trees, shrub masses or hedges, and ground covers. Procedures for relocation and stock piling shall be clearly defined in the Contract Documents.

- e. *Removal without Compensation:* Trees on SFRTA or FDOT property which interfere with construction or railway operations, and are identified as having no value to the design, shall be removed and relocated (if possible) in an approved manner.
- iv. **Planting Areas:**
- a. *Paved Pedestrian Areas:* Tree grates allowing for root aeration and watering shall be provided where trees are located in high-use plaza areas. Grates shall be a minimum of four (4) feet square or five (5) feet diameter.
  - b. Provisions for root aeration and watering shall be made for all existing trees to be retained in paved areas. Trees shall have root barriers/deflectors installed at the time of planting.
  - c. Where site conditions do not permit trees to be placed level with adjacent paving, they may be located in raised planters of sufficient size and depth to accommodate the anticipated mature root ball size.
  - d. *Sloped Areas:* Maximum slopes for planting shall be 3:1, with a four (4) feet minimum flat bank area at the

top and bottom of the slope. Water run-off from banks shall be coordinated with the site drainage system.

- e. *Vehicular Areas:* Local community standards may influence the ratio of trees to paved area. Trees in parking areas shall be located in densities in the parking stall landscape islands and medians. Landscape islands and medians that have plantings shall be curbed, or have tree grates.

### III.C IRRIGATION

Efficient water use shall be promulgated through proper design and management of landscape irrigation. Landscape irrigation systems shall conform to municipal land development codes in which TRI-RAIL facilities are located.

#### III.C.1 General Criteria

- i. **Coordination with Plant Material:** Irrigation systems shall be organized so that non-drought tolerant plantings shall be watered separately from the rest of the landscaping.
- ii. **Location:** Sprinklers and sprays shall not be used in areas less than 8'- 0" wide. Drip and bubbler devices having the minimum flow-rate necessary to water plant materials shall be used.
- iii. **Slope Conditions:** Sprinkler heads on slopes exceeding 15%, or on slopes exceeding 10% within 10'- 0" of hardscape areas, shall be calibrated to minimize runoff.
- iv. **Valves and Circuits:** Valves and circuits shall be designated based on anticipated water demand for each respective zone.
- v. **Trees:** Drip or bubbler irrigation systems shall be required for trees.

- vi. **Sprinkler Heads:** Sprinkler heads within respective control valve circuits shall have matched precipitation rates. Sprinkler heads shall be spaced for head-to-head coverage.
- vii. **Check Values:** Serviceable check valves shall be provided where elevation differential may cause low head drainage.
- viii. **Runoff:** Irrigation systems shall be designed for minimum runoff and overspray to non-irrigated areas.
- ix. **Control:** Irrigation systems shall be controlled by a central controller.
- x. **Programming:** Irrigation system controllers shall be capable of dual or multiple zone programming. Controllers shall have multiple cycle start capacity and a flexible calendar program.
- xi. **Irrigation Schedule:** Each irrigation system shall have an irrigation schedule prepared for maintenance personnel to follow. Irrigation schedules shall reflect time of year and plant maturity.
- xii. **Water Budget:** Irrigation schedules shall include a water budget, that includes the following:
  - a. Estimated annual water use in cubic feet, and the total area irrigated in square feet
  - b. Precipitation rates for each zone valve circuit
  - c. Monthly irrigation schedule for plant establishment period, and the first year thereafter.
- xiii. **Vacuum Breakers:** All vacuum breakers and controllers shall be located to eliminate the need for corrective screening.
- xiv. **Quick-Disconnect Valves:** In parking and plaza areas, quick-disconnect valves shall be provided for washing pavement and watering trees in pockets.
- xv. **Rain Detection:** Shutoff devices having automatic moisture sensors and controllers shall be provided. Precipitation rates for a given circuit shall not exceed soil absorption rates.

## IV. HARDSCAPE

### IV.A GENERAL

The criteria and primary goals for hardscape elements at TRI-RAIL sites are similar to those for landscape elements, and are as follows:

- a. Minimize visual impacts
- b. Establish a positive image for the system; and
- c. Help integrate station facilities within the surrounding community.

Other secondary goals include:

- a. **Site Organization:** To reinforce the site organization inherent in the design of each facility.
- b. **Ease of Maintenance:** Hardscape materials must be strong and durable, and should be as maintenance-free as practicable.

### IV.B DESIGN CRITERIA

Layout and sizing of hardscape elements shall be commensurate with anticipated levels of use. Major collector paths leading to platforms and station entranceways shall be designed and constructed to accommodate projected ridership growth, and shall include allowances for integrating site furnishings and landscape elements.

#### IV.B.1 Materials and Performance

- i. **Standard Paving:** Normal pedestrian paths such as sidewalks shall be a standard paving material such as concrete or asphalt.
- ii. **Special Paving:** Major pedestrian paths and special focus areas, such as

platform and station entrances, may receive special paving treatments to signify the importance of these areas.

- iii. **Roadway Crossings:** Major pedestrian crossings of vehicular roadways shall be of the same material as the pedestrian path, and may be further delineated by pavement markings, and border treatments such as brick and stone pavers.

Minor pedestrian walkway crossings of roadways may be delineated by standard markings, ADA-compliant where applicable.

- iv. **Slip Resistance:** Finishes on all paving and steps shall be slip resistant (minimum coefficient of friction of 0.5) and shall have a textured finish.

- v. **Slopes:** Slopes of walkways and plaza areas shall be 0.5 % minimum to 3.0% maximum, except at landings before and after a ramp, where the slope shall not exceed 2%.

Minimum grades for drainage of various paving materials shall be as follows:

Trowel finish concrete	1.5%
Broom finish concrete	1.5%
Exposed fine aggregate concrete	1.5%
Exposed coarse aggregate cone	2.0%
Asphalt	1.5%
Brick or stone set in sand	2.0%
Brick or stone set in mortar	1.5%
Crushed stone	1.0%

Slopes along ADA accessibility routes and parking spaces shall follow the ADAAD and Florida Accessibility Code guidelines.

#### IV.B.2 Parking Areas

The following shall be considered when designing hardscape element abutting or within parking areas:

- i. **Tree pocket curbs:** minimum 12" high
- ii. Drainage shall be directed away from areas where pedestrians walk or gather
- iii. Drainage at vehicle drop-off and pick-up areas shall be controlled to prevent splashing
- iv. Detailing of walkways and planting areas along parking stalls shall include a 12" minimum overhang for vehicles parked along curbs.

## V. MISCELLANEOUS SITE FEATURES

### V.A RETAINING WALLS

The use of retaining walls at TRI-RAIL station sites should be limited to those instances where the use of embankments is not practicable.

#### V.A.1 Program and Design Guidelines

Retaining walls, where used, shall be designed for stability against overturning and sliding, as well as overall structural integrity.

Retaining walls shall be of reinforced concrete, with either a rough-textured finish or an applied veneer, such as brick or stone. The use of timber cribbing, or loose-laid "gravity" wall retaining systems will not be allowed, except for protection of landscape elements.

Drainage, in the form of gravel fields, weepholes, or foundation drain piping, sufficient to prevent build-up of hydraulic pressure, shall be provided behind exposed faces of retaining walls.

#### V.A.2 Appearance

Appearance of retaining walls should relate to the natural features and topography of the station site, or to the architectural materials used in the station. At sites of historic or other distinction, material finishes and veneers shall be characteristic of the site.

### V.B FENCING

Fencing shall be provided as necessary to ensure station security, passenger safety, and compliance with accessibility

requirements. Fencing should be placed along station property lines to ensure the privacy of neighboring properties; fencing should also be installed along right-of-way lines, and between tracks at multiple-tracked stations, to discourage trespassers and passengers from entering the track area.

#### V.B.1 Appearance

Fencing shall be of uniform design and height throughout. Fence gates shall be of matching design and appearance as adjacent fencing.

#### V.B.2 Materials and Performance

Boundary and intertrack fencing shall be nominal 6'- 0" high chain link, vinyl coated, with top and bottom rails.

Fence fabric shall be 4'-0", 9-gage, galvanized steel wire.

Top rails, bottom rails, and line posts shall be 2" diameter; end posts shall be 4" diameter.

Fence posts, except where used for inter-track fencing, shall be set in concrete collars or curbing.

### V.C BOLLARDS

Bollards may be used to control vehicular access, or to act as a deterrent to unsafe pedestrian movements.

Bollards may be architectural elements of precast concrete or cast stone, or may simply be concrete-filled, steel pipes set in the ground or pavement.

Bollards shall be a minimum 6" in diameter, a minimum height of 48", or of height to suit their intended function.

Bollards shall be placed nominally 5'- 0" o.c., 2'- 0" from adjoining and parallel curb faces, and located with respect to the concrete scoring or paving pattern.

## V.D SCREENING

Most properties adjacent to TRI-RAIL stations deserve to have their privacy, while others create unsightly views from the station. Screening, either natural or constructed, may be used to mitigate these issues, provided such screening does not compromise customer safety.

Screening creates a buffer zone between the station site and adjacent properties. Depending on the available width of this buffer, screening may be created with landscape materials or constructed as a fence or wall.

Where the buffer is more than 5 ft. wide, a natural screen of hedgerows or tress is generally preferred over fencing. Where a minimum 5-foot buffer cannot be provided, or where particularly unpleasant conditions exist, a decorative fence or wall should be constructed.

### V.D.1 Appearance

Walls and fences constructed for screening purposes should be compatible with the architecture of the station and the surrounding community.

Planted screens should be sufficiently dense to achieve their intended purpose; they should be of a species which retain density and capacity throughout the year; and should otherwise conform to the requirements of Section IV of this Chapter for plantings.

### V.D.2 Materials and Performance

Materials used to construct screen walls and fences shall be selected for durability, ease of maintenance, and architectural compatibility.

## V.E SITE LIGHTING

The illumination of station site areas may vary depending on the type of property

development around the station. Specific site lighting guidelines for TRI-RAIL stations are found in Chapter 6 of these guidelines. The criteria listed below apply to those parts of the station site used to transfer passengers from busses, cars, or other means of transport into the station.

### V.E.1 General

Site lighting shall reinforce the site organization through the use of varying illumination levels, patterns, and colors.

Major elements, such as entrances, shall be articulated by higher levels of illumination. Secondary elements, such as pedestrian walkways, shall be emphasized by subdued patterns of lighting, to guide pedestrians along the path to the station.

### V.E.2 Station Site Lighting

Placement of lighting fixtures shall be coordinated with adjacent property development, support structures, and landscaping to ensure that these elements do not obstruct the light distribution pattern. Care shall be taken to minimize spill-over to adjacent properties.

Light levels on access roads shall be coordinated with light levels on surrounding public roads.

### V.E.3 Pedestrian Access Lighting

Pedestrian access lighting shall be adequate to safely define pedestrian footpaths, crosswalks, and vertical circulation elements.

### V.E.4 Landscaping

Special lighting of landscaping may be included in the lighting design, where appropriate. The design intent of lighting the landscape shall be site specific.

## VI. 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.

### VI.A SUSTAINABLE SITES (SS)

#### VI.A.1 SS Credit 1: Site Selection

The intent of this credit is to encourage development in areas that are urban or that have been previously developed, and discourage development in land that is adjacent to water bodies.

#### VI.A.2 SS Credit 2: Development Density and Community Connectivity

The intent of this credit is to preserve greenfields, habitats, and natural resources.

#### VI.A.3 SS Credit 4.1: Alternative Transportation – Public Transportation Access

The intent of this credit is to reduce pollution by automobiles, by providing a station with proximity to a bus station of within ½ mile.

#### VI.A.4 SS Credit 4.2: Alternative Transportation – Bicycle Storage and Changing Rooms

The intent of this credit is to reduce pollution by automobiles, by promoting the use of bicycles.

#### VI.A.5 SS Credit 4.3: Alternative Transportation – Low-Emitting and Fuel-Efficient Vehicles

The intent of this credit is to reduce pollution by automobiles, by providing preferred parking to low-emitting and fuel-efficient automobiles.

#### VI.A.6 SS Credit 4.4: Alternative Transportation – Parking Capacity

The intent of this credit is to provide preferred parking for vanpools and carpools for 5% of the total parking capacity.

#### VI.A.7 SS Credit 5.1: Site Development – Protect or Restore Habitat

The intent of this credit is to conserve and / or restore damaged areas to provide habitat.

#### VI.A.8 SS Credit 6.1: Stormwater Design – Quality Control

The intent of this credit is to reduce impervious cover, and increase infiltration.

#### VI.A.9 SS Credit 6.2: Stormwater Design – Quality Control

The intent of this credit is to reduce pollution of stormwater runoff by implementing best management practices (BMPs).

#### VI.A.10 SS Credit 7.1: Heat Island Effect – Nonroof

The intent of this credit is to reduce the heat island effect by using larger shade trees and hardscape materials that have low reflectivity index.

#### VI.A.11 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 low reflectivity index.

### VI.A.12 SS Credit 8: Light Pollution Reduction

The intent of this credit is to minimize light trespass from the building and site.

## VI.B WATER EFFICIENCY (WE)

### VI.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.

### VI.B.2 WE Credit 1: Water Efficient Landscaping

The intent of this credit is to limit or eliminate the use of potable water for irrigation of landscape.

### VI.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.

## VI.C ENERGY & ATMOSPHERE (EA)

### VI.C.1 EA Credit 1: Optimize Energy Performance

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

### VI.C.2 EA Credit 2: On-site Renewable Energy

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

### VI.C.3 EA Credit 6: Green Power

The intent if 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.

## IV.D MATERIALS & RESOURCES (MR)

### VI.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.

### VI.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.

### VI.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.

### VI.D.4 MR Credit 7: Certified Wood

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

## END OF CHAPTER