



Enhancements Manual

Miami-Dade County • Florida



Miami-Dade Expressway Authority

An Agency of the State of Florida

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Introduction

The Board of the Miami-Dade Expressway Authority (MDX), an agency of the State of Florida, adopted a policy that focuses on developing roadway enhancements as an integral part of all infrastructure projects undertaken by MDX. Enhancements were defined in this policy as right-of-way beautification, noise mitigation, landscape improvements, large scale sculptural works, novel architectural approaches, greenways, bike paths, and roadside parks. The first phase of the implementation of this policy included the development of the first Enhancements Manual in 2003, to provide guidelines for the design of landscape improvements and hardscape elements of new infrastructure projects since the creation of MDX.

The intent of this manual is to provide guidance to the designer by referencing enhancements to the primary design. The manual is not intended to be a detailed design manual that could supersede the need for the application of sound principles by knowledgeable design professionals. All final designs based on the guidance contained in this manual shall meet all applicable state and federal regulations and provisions for work contained in the solicitation documents. It shall be the designers responsibility to acquire and utilize the necessary manuals that apply to the work required to complete the project. The goal is to create a unified image for the roadways of the Miami-Dade Expressway Authority, while adhering to established Florida Department of Transportation roadway standards. In the case of a discrepancy, the applicable state and federal regulations shall supersede the Enhancement Manual. The second phase of the implementation of this policy includes the development of Landscape-Hardscape Schematic Designs by a team of landscape architects, planners, architects, and engineers during the conceptual or preliminary design phase of all new infrastructure projects. During this phase, all elements of the Miami-Dade Expressway Authority enhancements policy are inventoried and analyzed resulting in the final Landscape-Hardscape Schematics, Concept Report and Aesthetic Design Criteria for each infrastructure project. These three documents reference the specific hardscape and landscape guidelines that are part of this Enhancements Manual. The intent is that the manual continue to evolve and respond to the needs of each new infrastructure project of the Miami-Dade Expressway Authority.

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Retaining Walls

Mechanically stabilized earth walls (MSE) shall be per the latest Florida Department of Transportation Design Standards .

The corners, end points, and tops of all MSE walls shall include the installation of corner panels, end point panels, and top coping panels respectively to provide a smooth finished edge condition or frame as indicated in the diagram on this page. The Standard Finish for MSE walls, corner panels, endpoint panels, and top coping panels shall be smooth finish concrete unless the MSE wall is specified to receive an Accent Finish. The Accent Finish shall be applied to the vertical surface of the MSE wall designated to receive an accent finish excluding the corner panels, endpoint panels, top coping panels, and other MSE walls designated for a standard finish. The color selection for the Class 5 or mineral paint finish that shall be applied to all MSE walls shall be selected from the Color Palette included in this Manual.

The MSE Wall accent finish layout shall have Accent Finish MSE Wall panels under all bridges and be as shown in the elevation below from the starting point next to the smooth finish corner panel 125' of the Standard Finish MSE Wall shall be followed by 75' of Accent Finish MSE Wall. The 125' of Standard Finish MSE Wall and 75' of Accent Finish MSE Wall shall continue for the entire length of the MSE Wall and end at the smooth finish endpoint panel.

Reinforced concrete wall shall have a smooth finish with colors/finish to match corridor color/finish. MSE wall panel textures and colors shall match those selected for noise walls

Note: In some cases, a retaining wall may be used along the entire accent wall.



EXAMPLE OF CORNER PANEL & TOP COPING



EXAMPLE OF CONCRETE ACCENT DETAIL

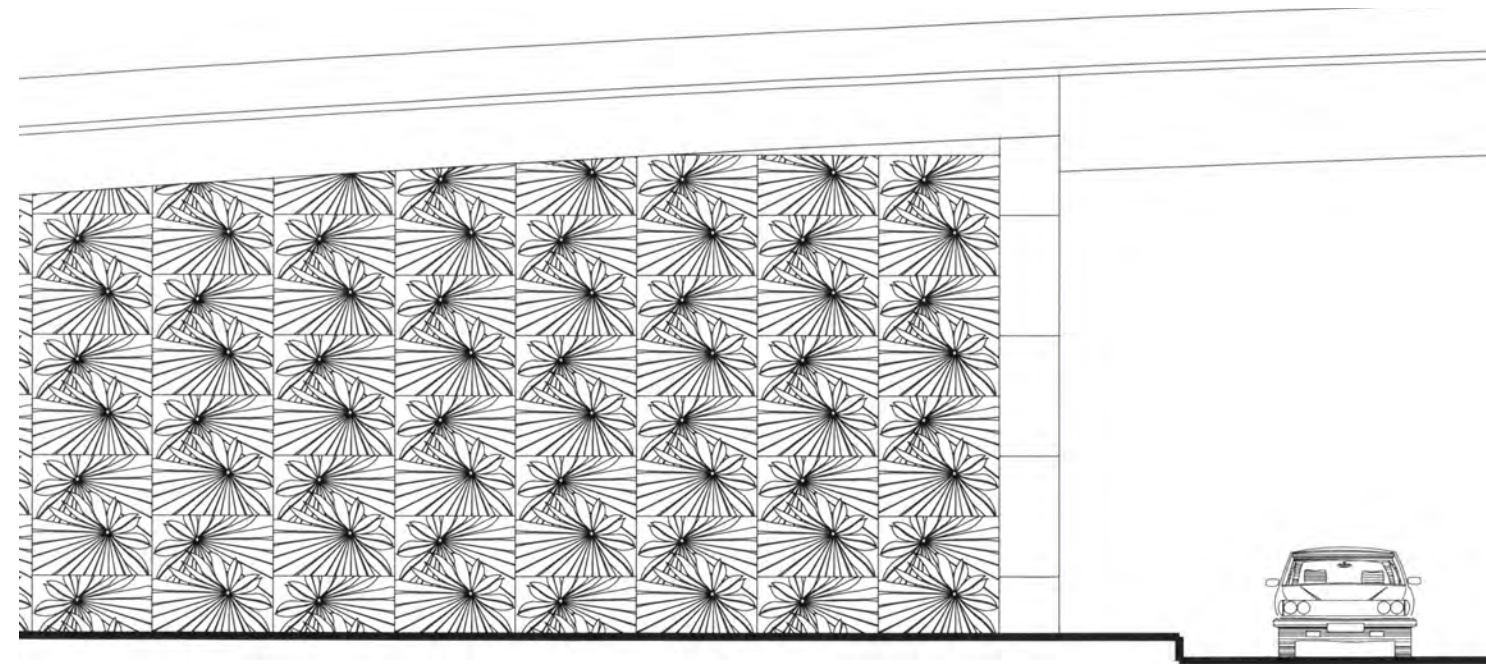
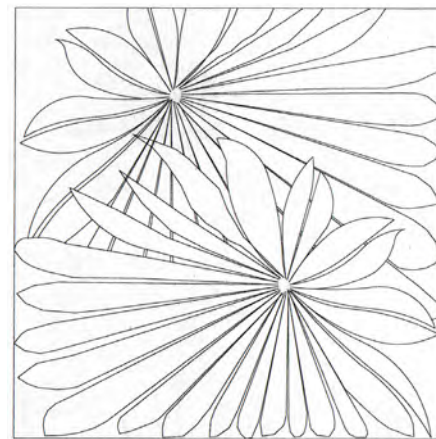
NOTE:
-IMAGES FOR DESIGN INTENT ONLY.

Concrete Accent Finishes

Accent Finish A

This palm frond silhouette pattern shall fill the entire face of each MSE, Noise Wall, Column, or Signage Structure designated to receive an Accent Finish. The same pattern shall be repeated on all precast panels for MSE, Noise Walls, Columns, and Signage Structures that are designated to receive an Accent Finish. The corner panels and top coping panels shall have a smooth finish or the concrete Accent Finish. The pattern shall fill the entire face of each reveal on the Signage Structures. This form liner shall be designed and manufactured by the Design-Build team and shall be solely the property of MDX.

Accent Finish A
Not to scale



MSE WALL ACCENT FINISH APPLICATION
(Refer to MSE Wall Finish Layout in Retaining Walls Section of this Manual)



EXAMPLE OF 874/878 ACCENT FINISH

NOTE:
-IMAGES FOR DESIGN INTENT ONLY

Noise Walls

All noise walls and their alternates shall comply with the aesthetic design intent of noise walls shown in this manual. The lengths of the accent noise walls (ANW) and the standard noise walls (SNW) shall comply with the minimums and maximums shown in the composites in this manual.

All standard noise wall segments shall have smooth finish concrete. All accent noise wall segments shall have colors and patterns as shown in the composites in this manual. The design and application of concrete accent colors shall comply with the proportions of the accent noise wall panel selection criteria shown in this manual. Provide a 2" reveal between the accent areas and the field (lighter) color.

All standard and accent noise walls shall receive a Class 5 paint finish. The color selection for the Class 5 paint finish to be applied to the noise walls shall be selected from the Color Palette included in this manual.

Maintenance vehicle and personnel access shall be provided as required by MDX.



EXAMPLES OF SR 836 CORRIDOR

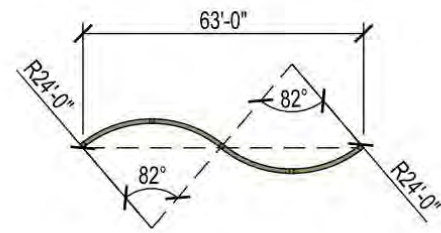


EXAMPLE OF NOISE WALL "C" SR 874 CORRIDOR

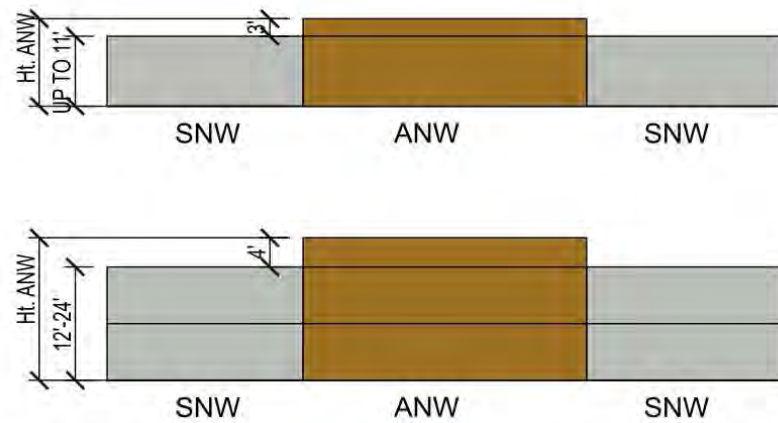
NOTE:

-IMAGES FOR DESIGN INTENT ONLY.

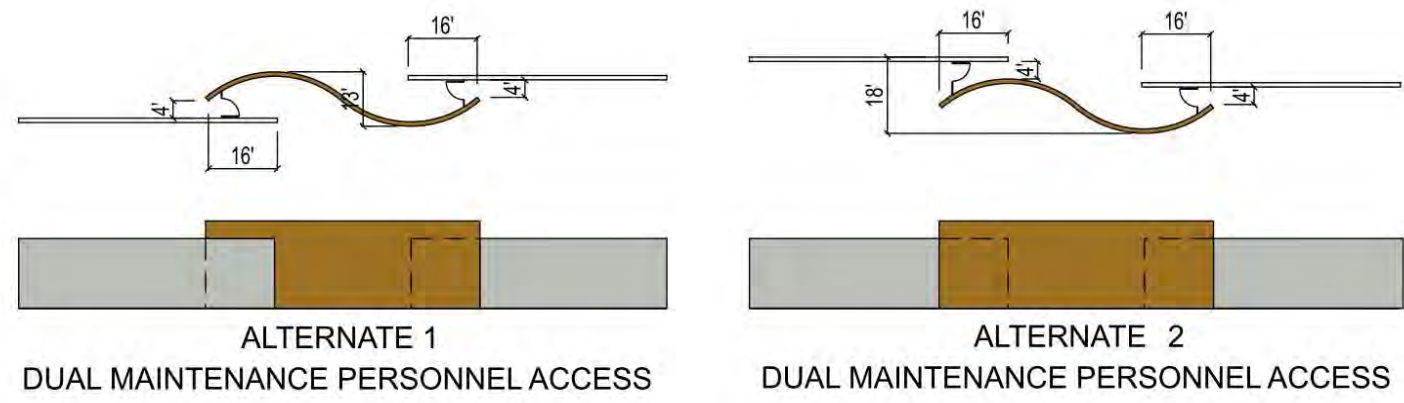
NOISE WALL A & B



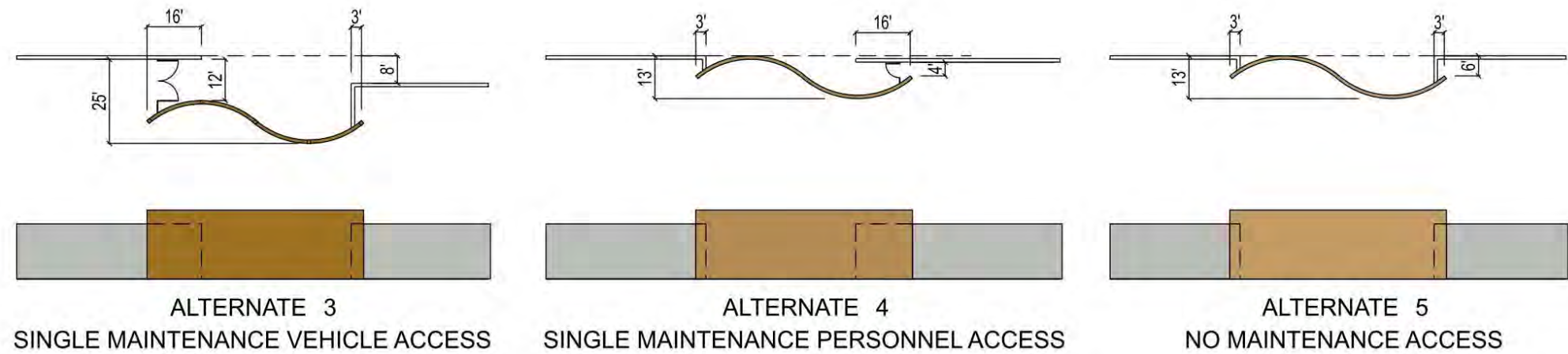
PANEL HEIGHTS FOR ALL NOISE WALL TYPES A-D		
NOISE WALL HEIGHT	NUMBER OF PANELS	ACCENT PANEL
UP TO 11'	1 PANEL	ADDITIONAL 3' OF ACCENT PANEL ABOVE STANDARD PANEL
FROM 12' TO 24'	2 PANELS	ADDITIONAL 4' OF ACCENT PANEL ABOVE STANDARD PANEL



NOISE WALL A MAINTENANCE ACCESS

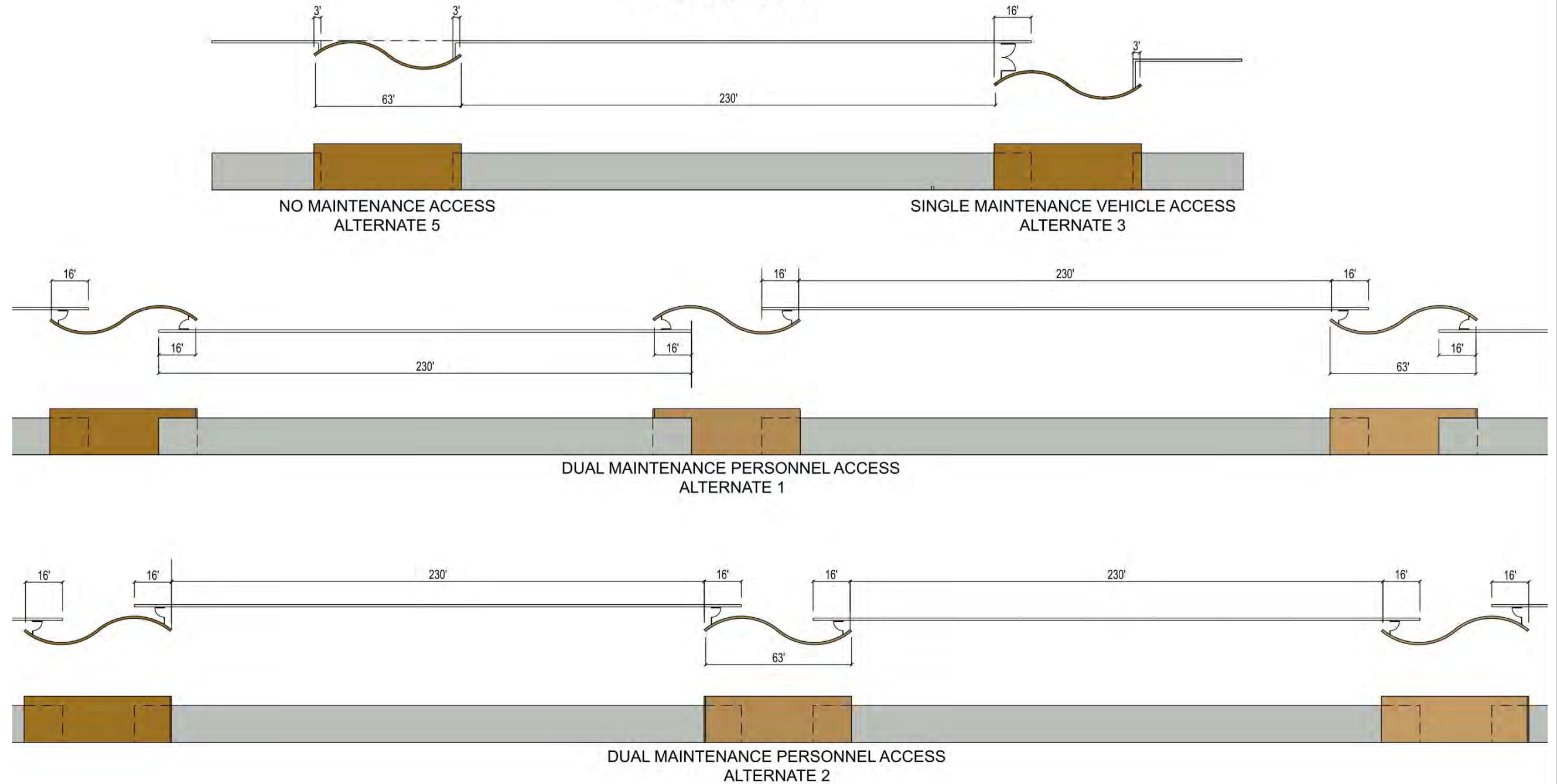


LEGEND:
 Ht. = Height
 ANW = Accent Noise Wall Segment
 SNW = Standard Noise Wall Segment



NOTE:
 -IMAGES FOR DESIGN INTENT ONLY.

NOISE WALL A COMPOSITES

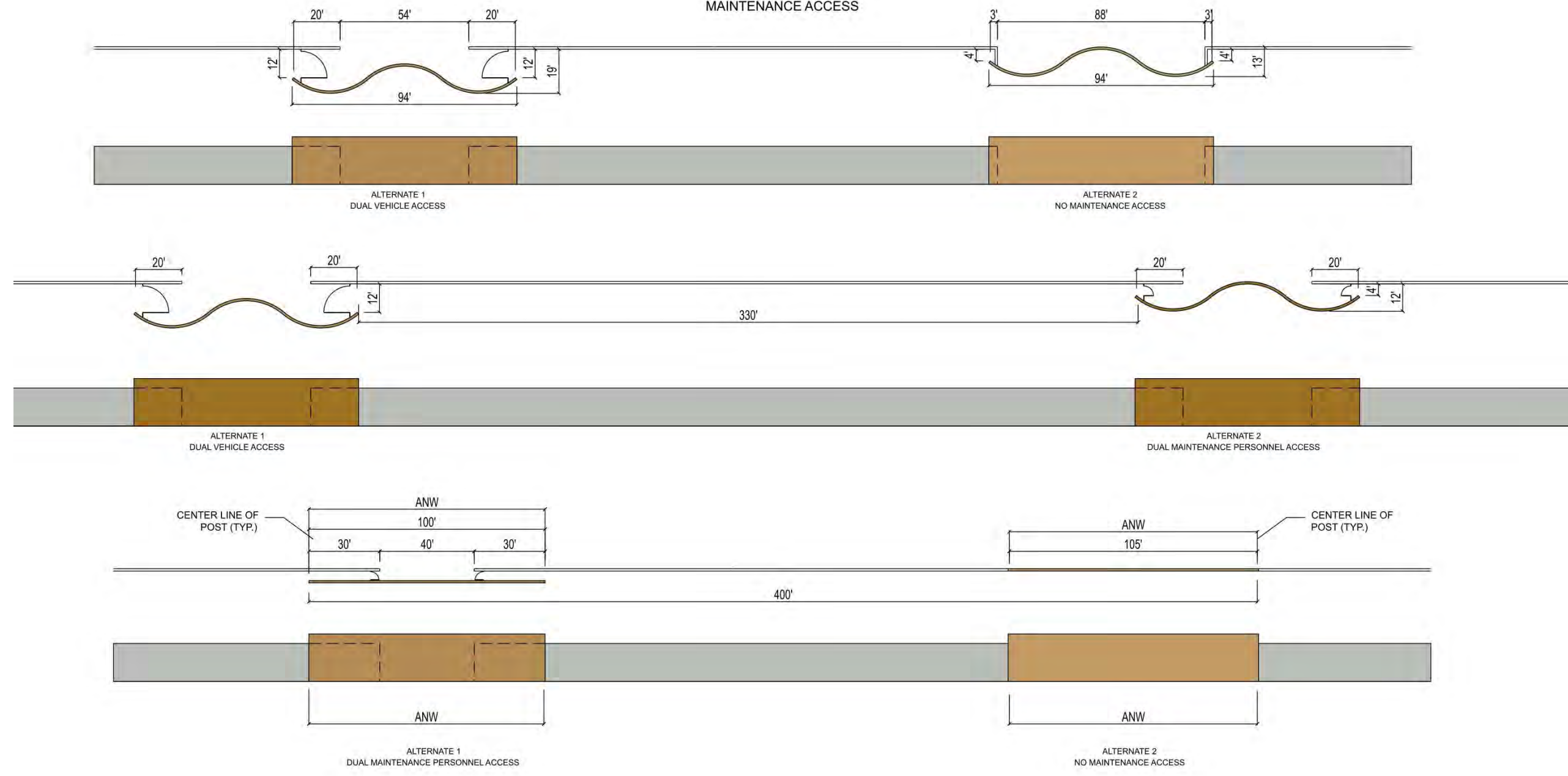


NOTE:

- IMAGES FOR DESIGN INTENT ONLY.
- OTHER ALTERNATES ARE POSSIBLE FOR CONFIGURING NOISE WALLS. IN ALL CASES MAXIMUM AND MINIMUM DISTANCES BETWEEN ACCENT NOISE WALLS (ANW) AND STANDARD NOISE WALLS (SNW) SHALL BE MAINTAINED.

NOISE WALL B COMPOSITES

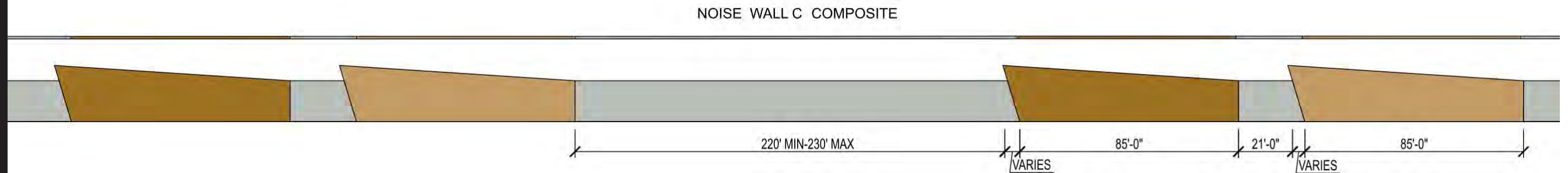
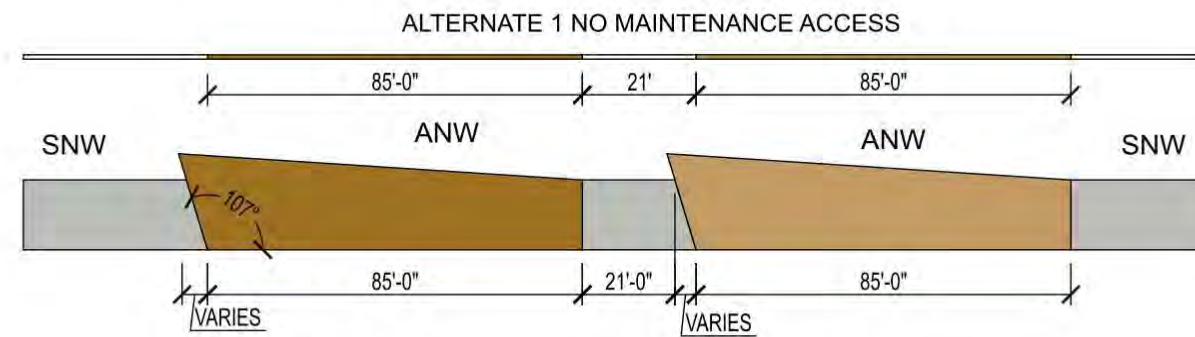
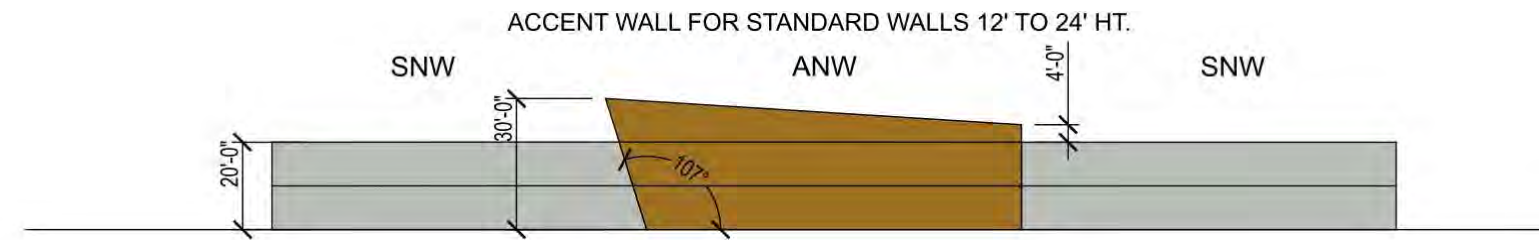
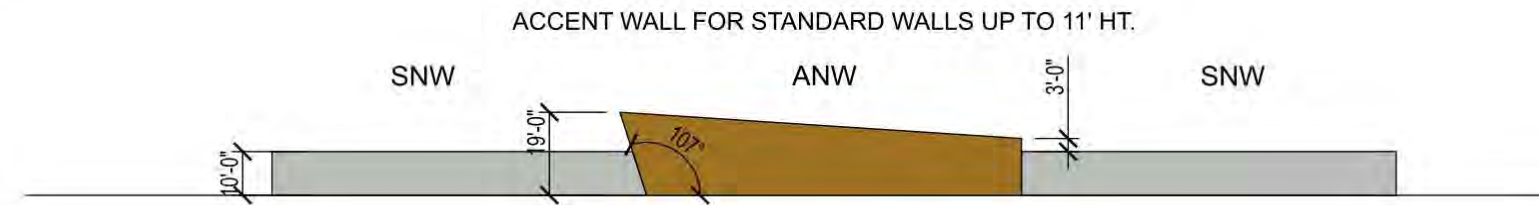
MAINTENANCE ACCESS



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 -OTHER ALTERNATES ARE POSSIBLE FOR CONFIGURING NOISE WALLS. IN ALL CASES MAXIMUM AND MINIMUM DISTANCES BETWEEN ACCENT NOISE WALLS (ANW) AND STANDARD NOISE WALLS (SNW) SHALL BE MAINTAINED.

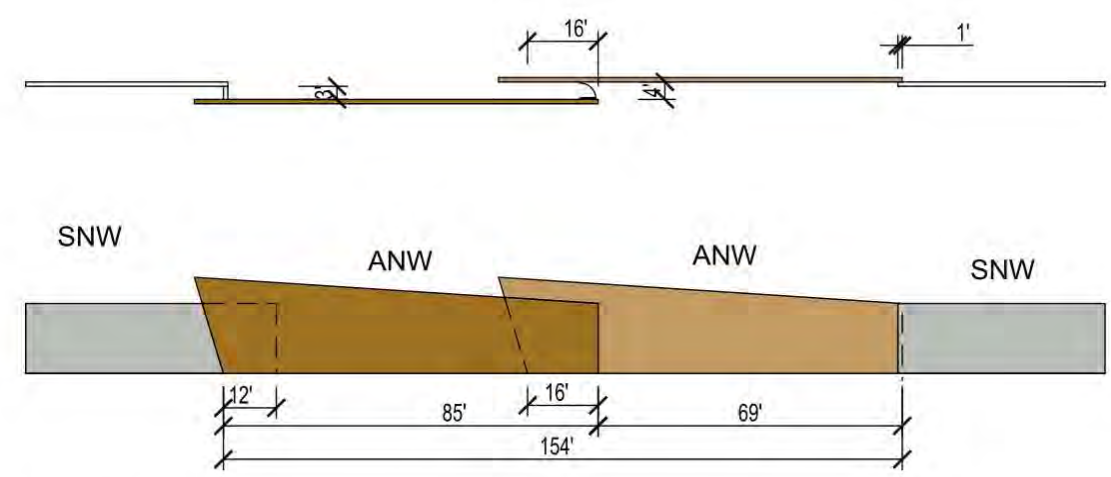
LEGEND:
 HT.= HEIGHT
 ANW= ACCENT NOISE WALL SEGMENT
 SNW= STANDARD NOISE WALL SEGMENT

NOISE WALL C

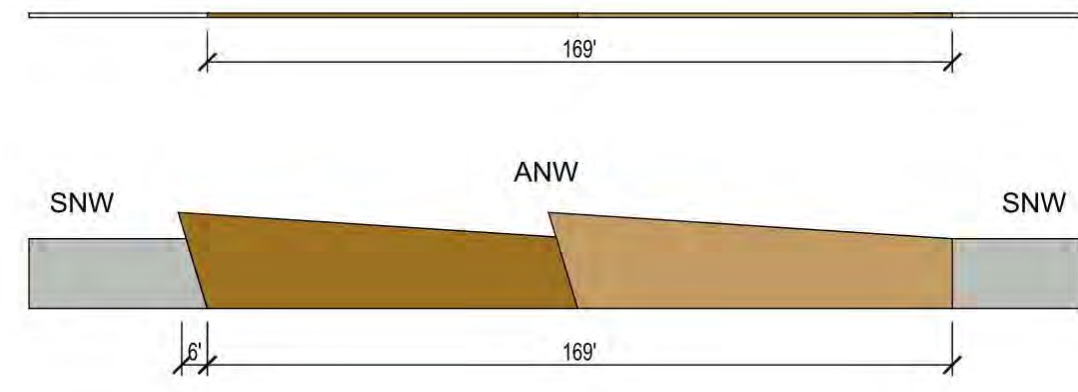


NOTE:
 -IMAGES FOR DESIGN INTENT ONLY.
 -OTHER ALTERNATES ARE POSSIBLE FOR CONFIGURING NOISE WALLS. IN ALL CASES MAXIMUM AND MINIMUM DISTANCES BETWEEN ACCENT NOISE WALLS (ANW) AND STANDARD NOISE WALLS (SNW) SHALL BE MAINTAINED.

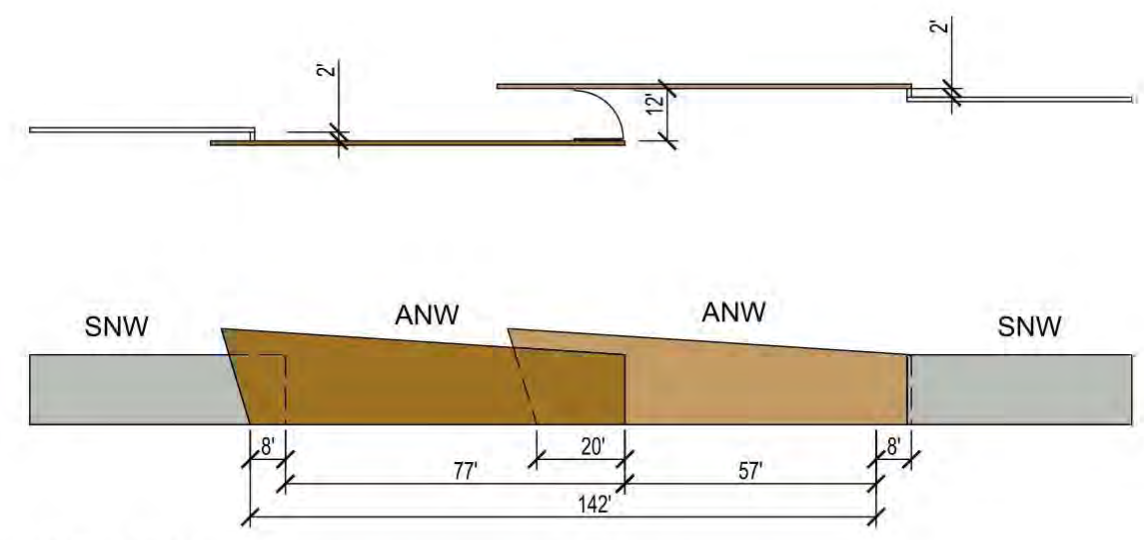
NOISE WALL D MAINTENANCE ACCESS



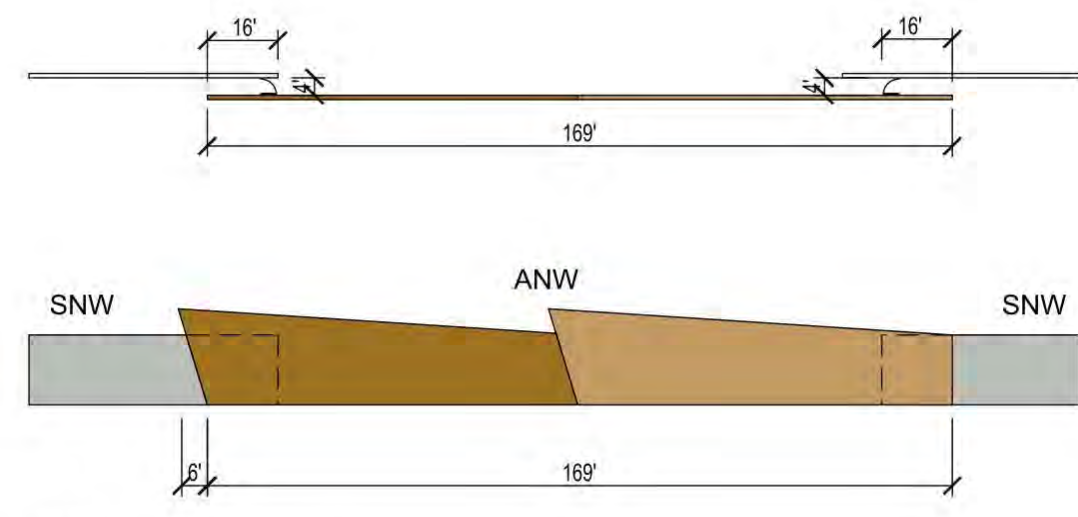
ALTERNATE 1
SINGLE MAINTENANCE PERSONNEL ACCESS



ALTERNATE 2
NO MAINTENANCE ACCESS



ALTERNATE 3
SINGLE MAINTENANCE VEHICLE ACCESS



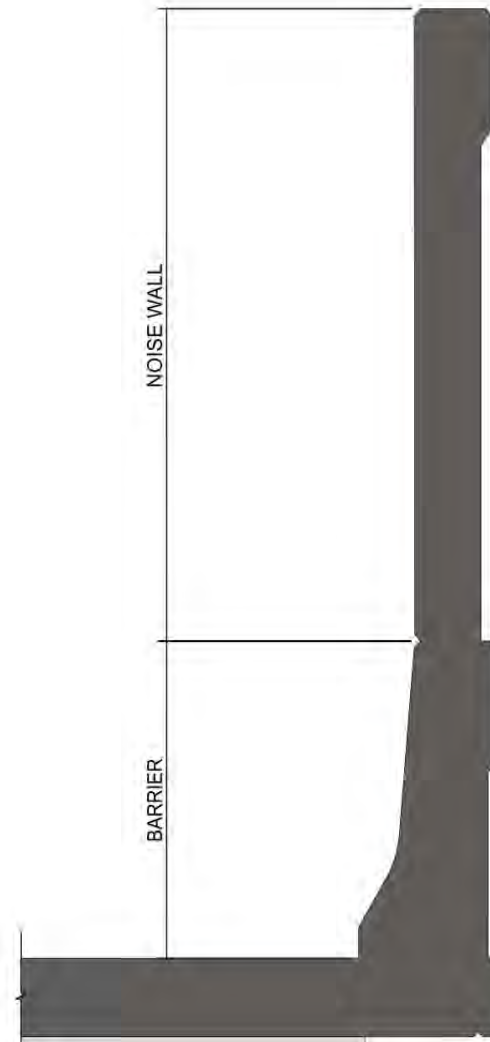
ALTERNATE 4
DUAL MAINTENANCE ACCESS

NOTE:
 -IMAGES FOR DESIGN INTENT ONLY.
 -OTHER ALTERNATES ARE POSSIBLE FOR CONFIGURING NOISE WALLS. IN ALL CASES MAXIMUM AND MINIMUM DISTANCES BETWEEN ACCENT NOISE WALLS (ANW) AND STANDARD NOISE WALLS (SNW) SHALL BE MAINTAINED.

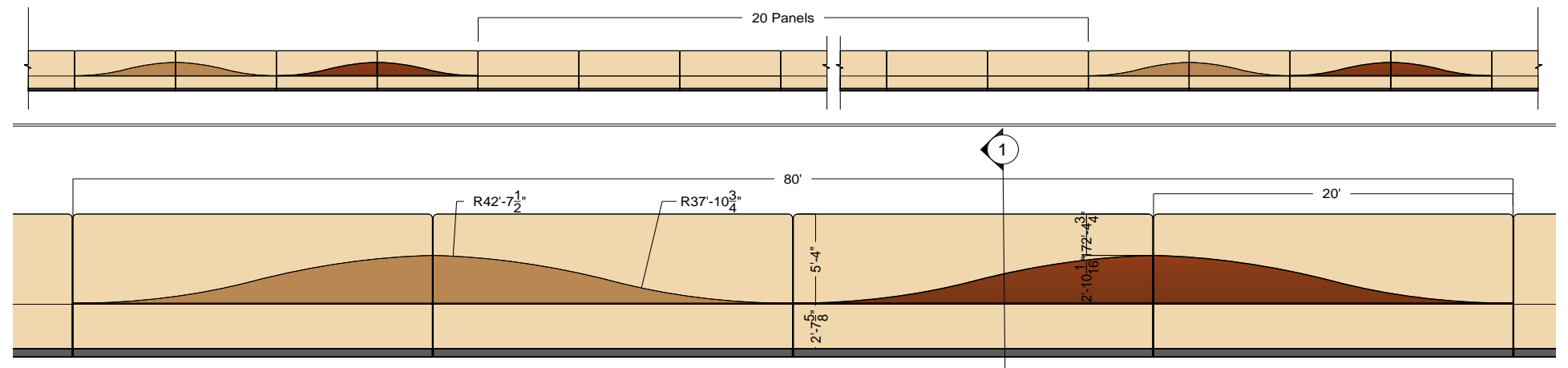
Noise Walls – Barrier Mounted

Noise Walls shall be constructed of a reinforced concrete system for bridges and elevated roadway sections where it has been determined that noise abatement measures are required.

The system shall provide noise abatement in accordance with project requirements and shall be installed on barrier walls in accordance with manufacturer's specifications. Transparent noise wall panels will retain clarity and physical strength and shall meet or exceed FHWA and FDOT standards. Noise wall structure shall be painted with colors specified in the color palette in this manual.



SECTION OF BARRIER MOUNTED NOISE WALL



EXAMPLE OF BARRIER MOUNTED CONCRETE NOISE WALL

NOTE:
-IMAGES FOR DESIGN INTENT ONLY

Noise Walls-Transparent

Transparent Noise Walls shall be constructed of a structural system where it has been determined that noise abatement is required. The system shall meet FDOT requirements.

The system shall provide noise abatement in accordance with project requirements. These transparent noise wall panels will retain clarity and physical strength per FDOT requirements. Transparent noise wall structure shall be painted with colors specified in the color palette in this manual.

These panels will provide views of landscape beyond, and be located to enhance the visual experience of the corridor.



EXAMPLE OF TRANSPARENT NOISE WALL SR 874 CORRIDOR



EXAMPLE OF TRANSPARENT NOISE WALL



TRANSPARENT NOISE WALL - MOUNTED BEHIND BARRIER

NOTE:
-IMAGES FOR DESIGN INTENT ONLY

Columns

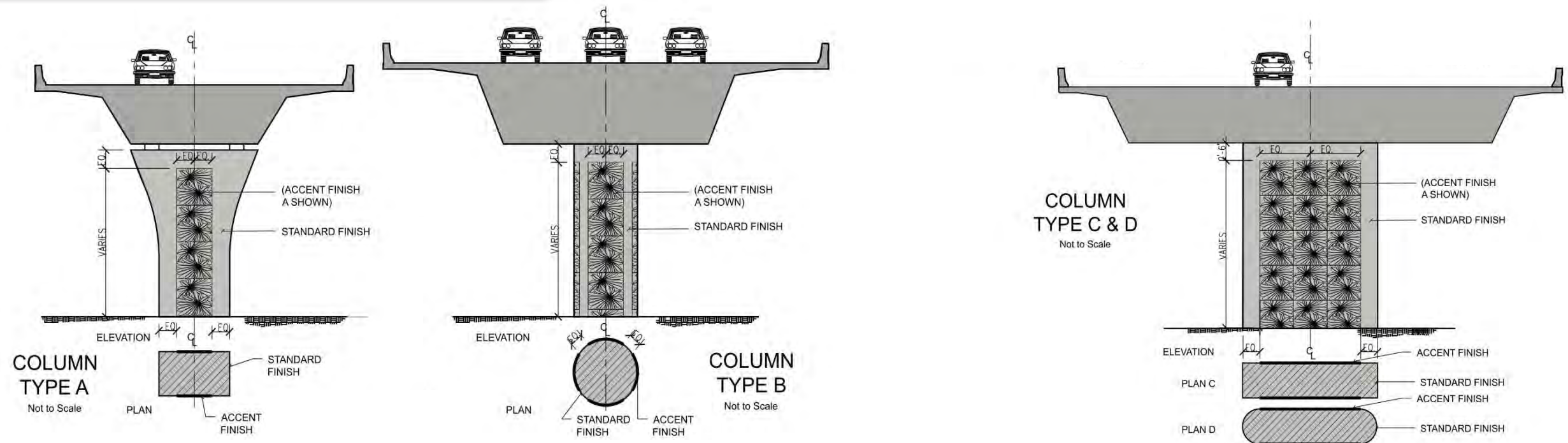
All columns shall comply with the aesthetic design intent of Column A, B, C, or D included in this manual and as indicated in the scope for the project. Columns shall have a Concrete Accent Finish A designated in this manual. The color selection for the Class 5 or mineral paint finish that shall be applied to all columns shall be selected from the Color Palette included in this Manual.

Columns Type A, B, C, and D

Column type A shall have reveals on two faces as indicated and shall have Concrete Accent Finish A applied vertically to the full area of the reveal. Column type B shall have four reveals and shall have Concrete Accent Finish A applied vertically to the full area of the reveal. Column type C shall have reveals on two faces as indicated and shall have Concrete Accent Finish A applied vertically to the full area of the reveal. All areas outside the reveals shall have smooth finish concrete. Column type D shall have reveals on two faces as indicated and shall have Concrete Accent Finish A applied vertically to the full area of the reveal. All areas outside the reveals shall have smooth finish concrete.



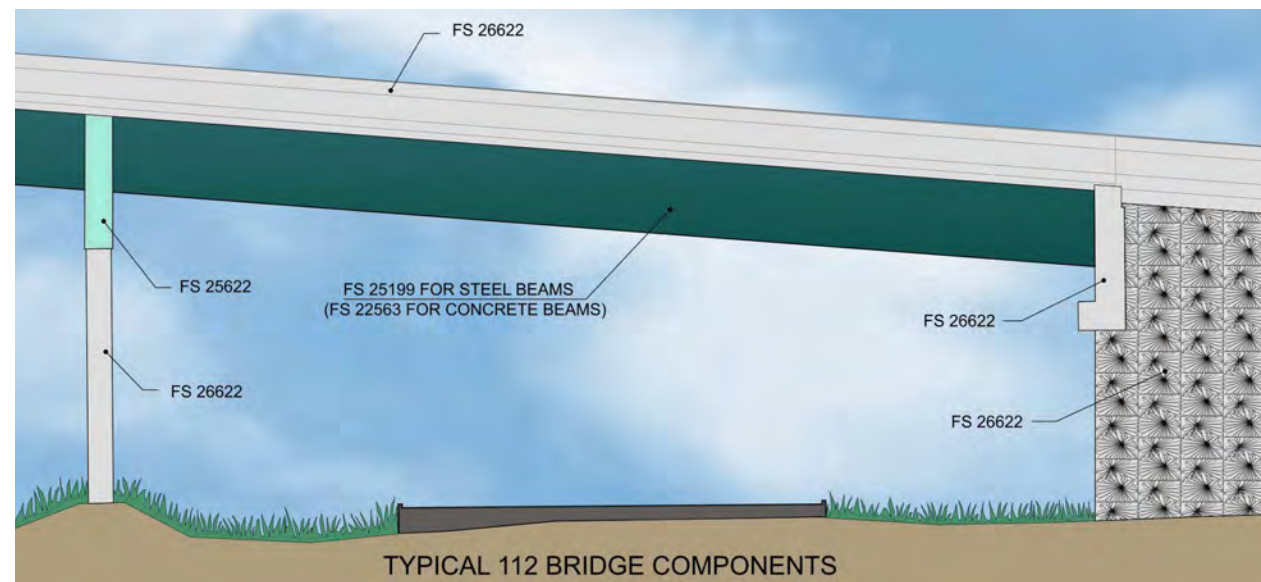
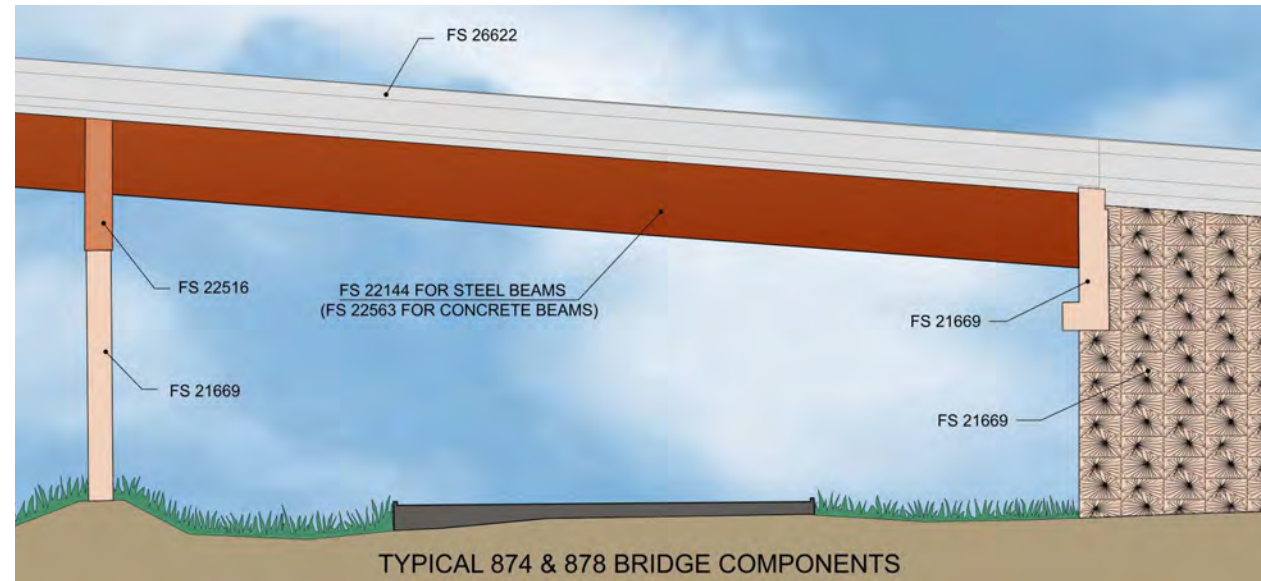
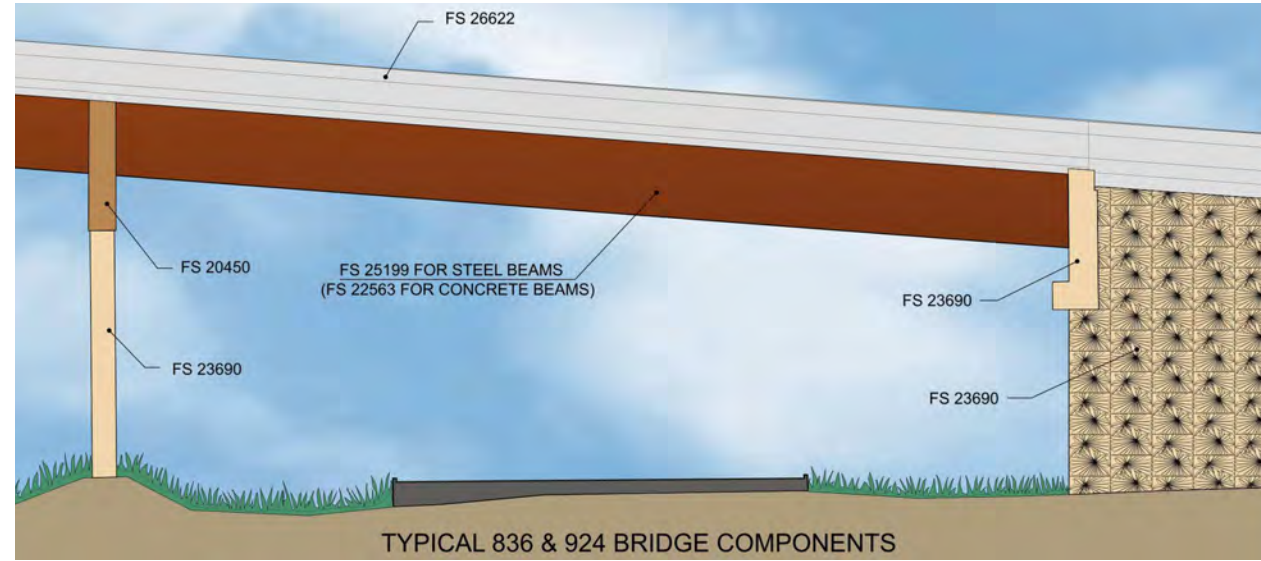
TYPICAL COLUMN



NOTE:
-IMAGES FOR DESIGN INTENT ONLY.

Bridges

All bridges shall comply with the aesthetic design intent in the images shown in this manual and the criteria listed in the color palette included in this manual. The color selection for the Class 5 or mineral paint finish that shall be applied to all bridges shall be selected from the Color Palette included in this manual.



NOTE:
-IMAGES FOR DESIGN INTENT ONLY

Concrete ORT Structures

All cantilever, butterfly, and ORT signage structures and the finish of the structures shall comply with the aesthetic design intent of this Manual. The column shall be constructed of concrete with a smooth finish, except the reveal which shall have a Concrete Accent Finish A. The reveal shall occur on both sides of the ORT structure. The horizontal support for the ORT equipment shall be constructed of a round steel tube with no tapers. The color selection for the Class 5 Finish or mineral based paint finish that shall applied to the surface of the column shall be selected from the Color Palette for Concrete and Glazed Concrete Surfaces that is part of this Manual. The color selection for the horizontal support shall be selected from the Color Palette for Metal Surfaces that is part of this Manual.

Steel ORT Structures

All cantilever, single and double span structures, and the finish of these structures, shall comply with the aesthetic design intent of this Manual. The columns shall be constructed of a round, galvanized steel tube. The horizontal support shall be constructed of a round, galvanized steel tube with no tapers. Any splices that may be needed to fabricate the steel tube shall be located behind the panels. The color selection for both structural members shall be as listed in the enclosed rendering and listed in the Color Palette that is part of this Manual. The ORT structure shall have perforated stainless steel panels by McNichols Company or approved equal mounted on curved, galvanized steel members. The panels shall be a quality round perforated, 14 gauge stainless steel panel with 1/4" round holes on 3/8" staggered pattern, 4' wide x 10' length (standard panel), mill finish, 40% open area, with finished sides. Cut panel to size as needed. All perforated panel fasteners shall be as required by structural engineer. Provide separation between dissimilar metals. Proposed Sign structures shall be similar in appearance to the ORT structures. Provide intermediate support angles where panels meet to ensure panels are secured on all sides and do not cause separation between joining panels and structure.

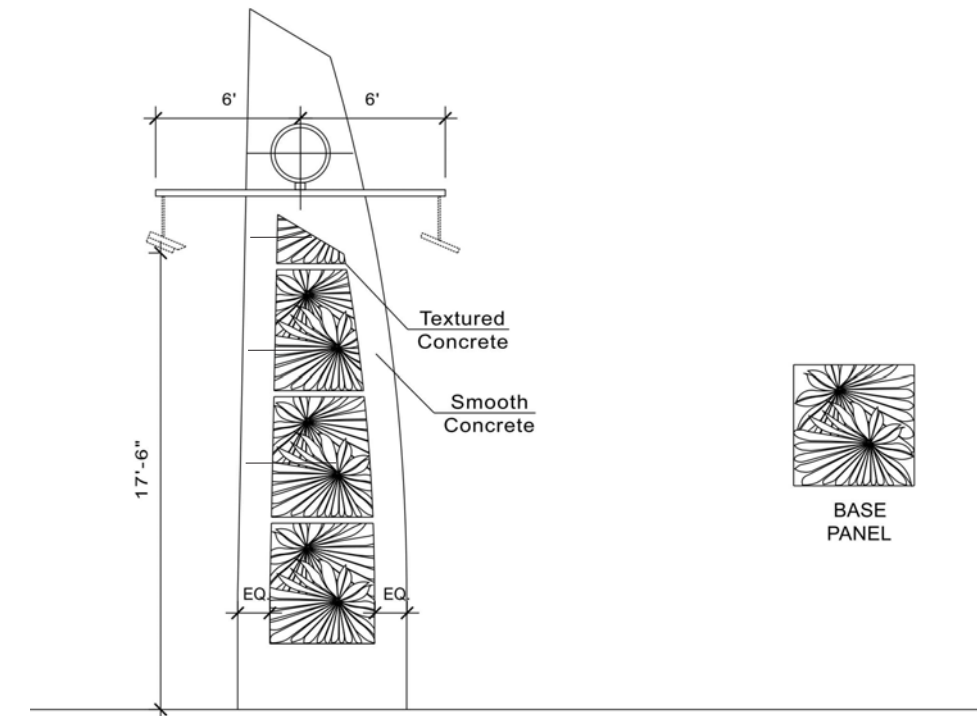
Sign Panels, Light Fixtures and Hardware

All sign panels shall meet the requirements of the Florida Department of Transportation, MUTCD and AASHTO. The back side of the sign panel, the sign panel light fixtures and related conduit and support structures, and the hardware needed to attach the sign panel shall be painted the same color as the horizontal support. The Sunpass logo on the gantry structures shall be stainless steel, dicast, and painted to be consistent with the Sunpass colors. The Sunpass logo lighting shall be designed as necessary for illuminating the logo proposed for the ramp and mainline gantry structures, based on the criteria established herein.

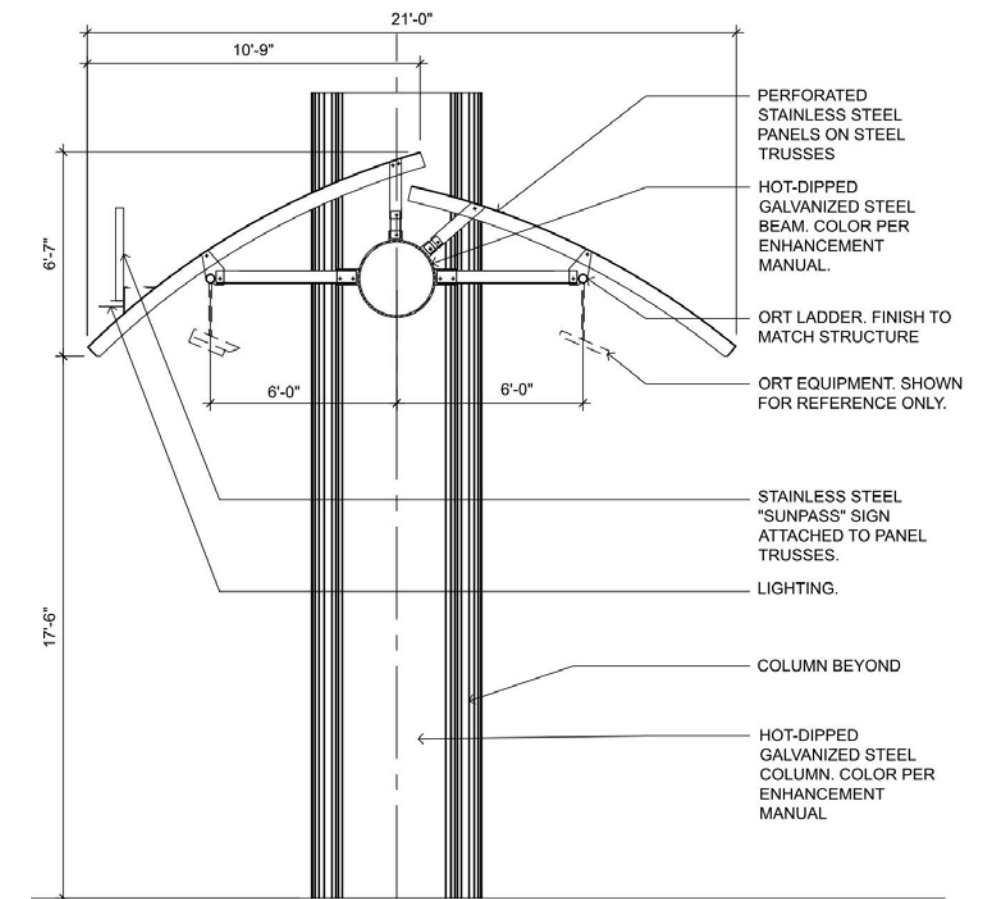
- The lighting solution shall be linear, complement the aesthetic of the stainless steel perforated panels, and be of size and scale that will not detract from the look of the gantries.

NOTE:

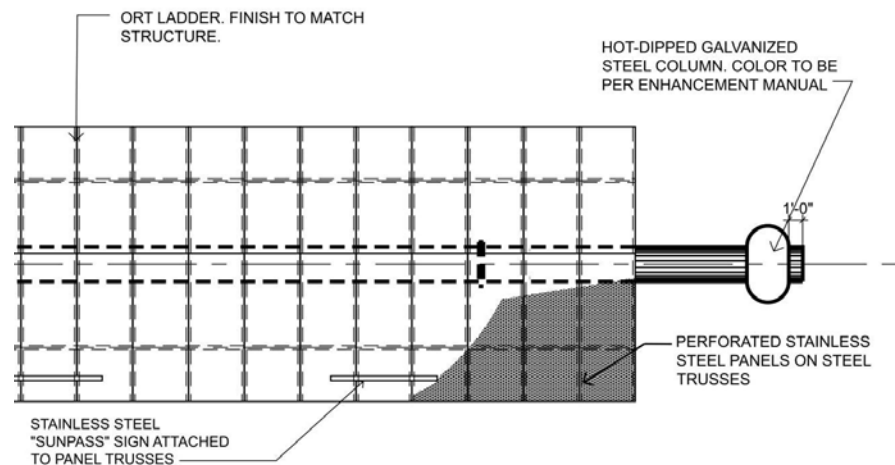
-IMAGES FOR DESIGN INTENT ONLY



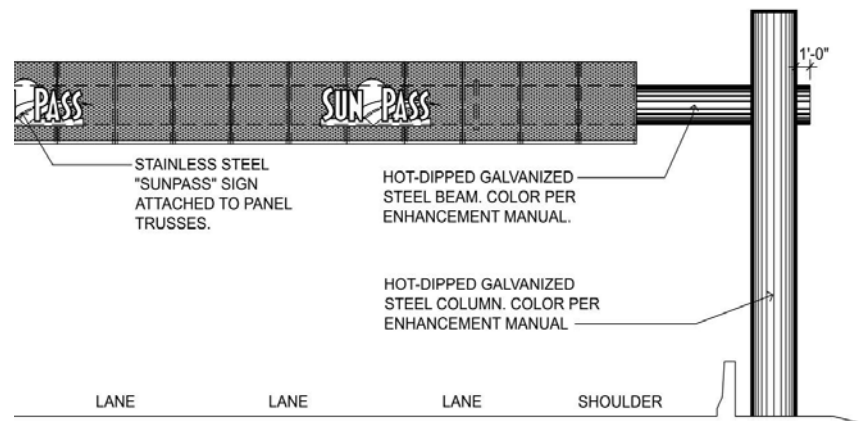
ELEVATION VIEW OF FIN COLUMN



SECTION VIEW OF SCREEN

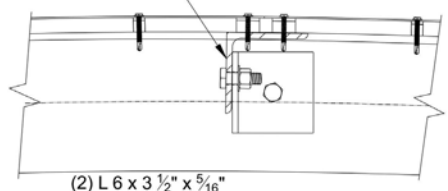


PLAN VIEW



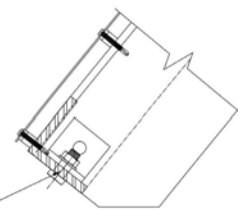
ELEVATION VIEW

GALV. L W/ CLIP AND BOLTED A325 GALV. BOLTS TO SUPPORT PERF. PANEL AT JOINT.

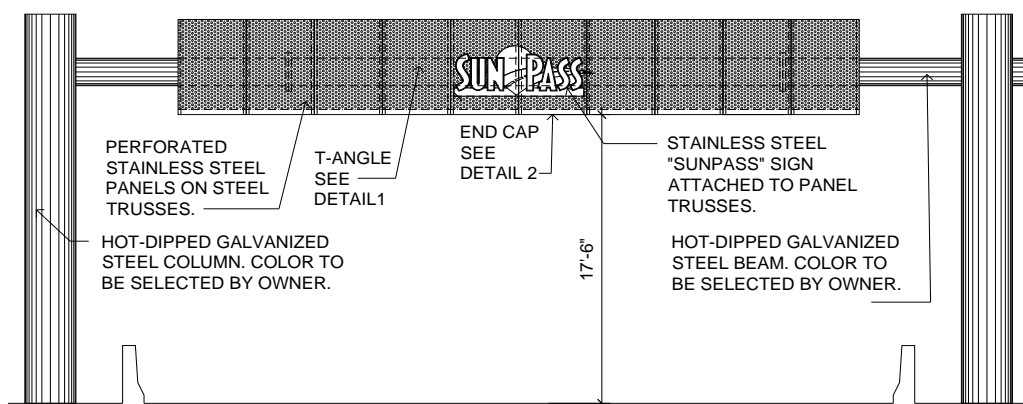


1 T-ANGLE STRUCTURAL DETAIL

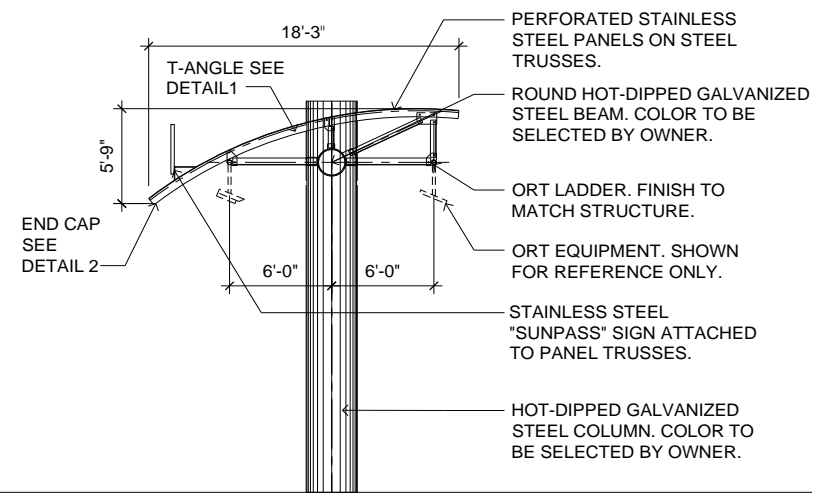
GALV. L W/ CLIP AND BOLTED A325 GALV. BOLTS TO SUPPORT PERF. PANEL AT EA. END OF TRUSS.



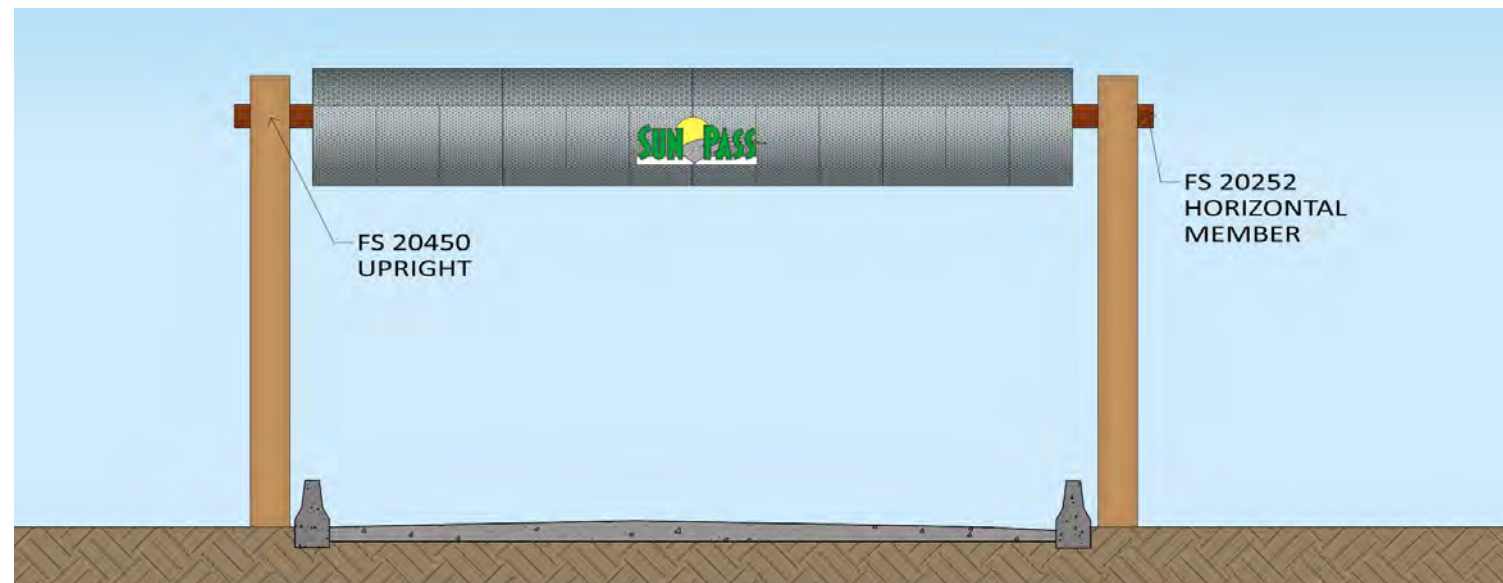
2 END CAP DETAIL



ELEVATION VIEW



SECTION VIEW

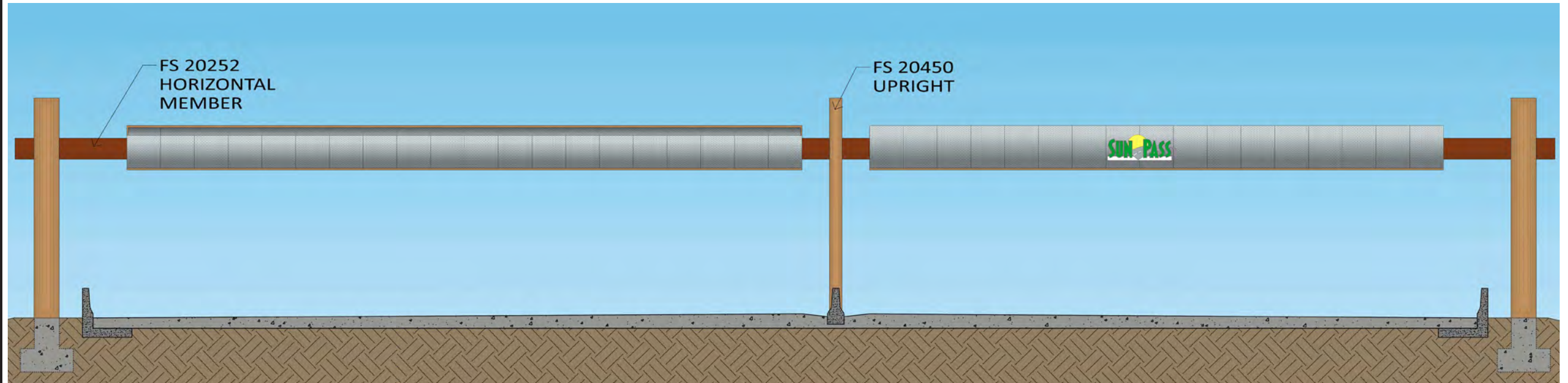


EXAMPLE FOR 836 EAST OF PALMETTO



EXAMPLE FOR 836 EAST OF PALMETTO

NOTE:
-IMAGES FOR DESIGN INTENT ONLY



EXAMPLE FOR 836 ORT EAST OF PALMETTO



EXAMPLE FOR 836 ORT AT 57TH AVE



EXAMPLE FOR 836 CONCRETE FIN

NOTE:
-IMAGES FOR DESIGN INTENT ONLY



EXAMPLE FOR 874/878 ORT

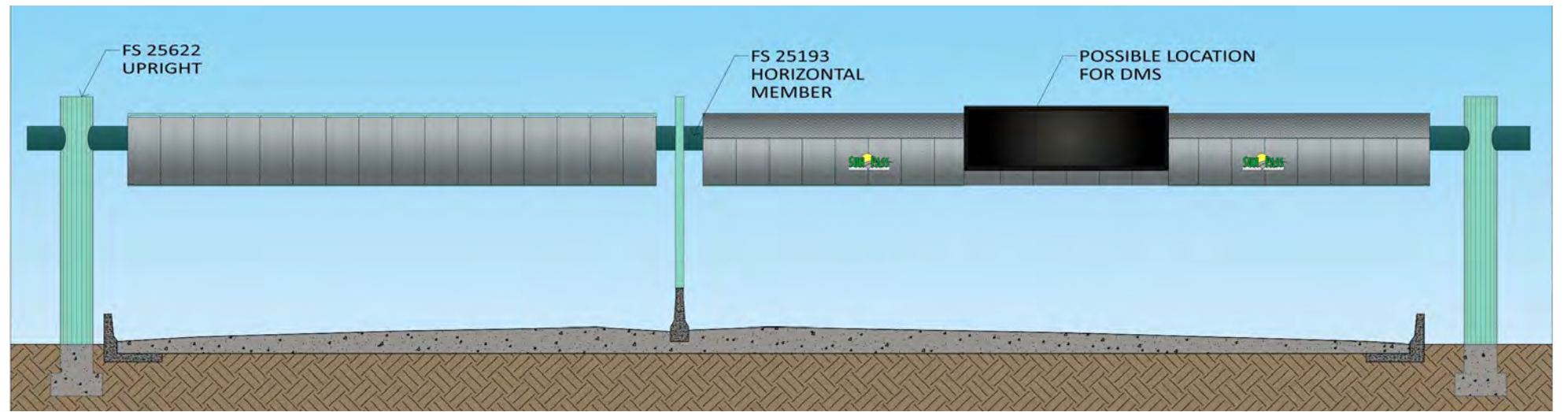


EXAMPLE FOR 874/878 ORT



EXAMPLE FOR 874/878 ORT

NOTE:
-IMAGES FOR DESIGN INTENT ONLY



EXAMPLE FOR 112 ORT



EXAMPLE FOR 112 ORT

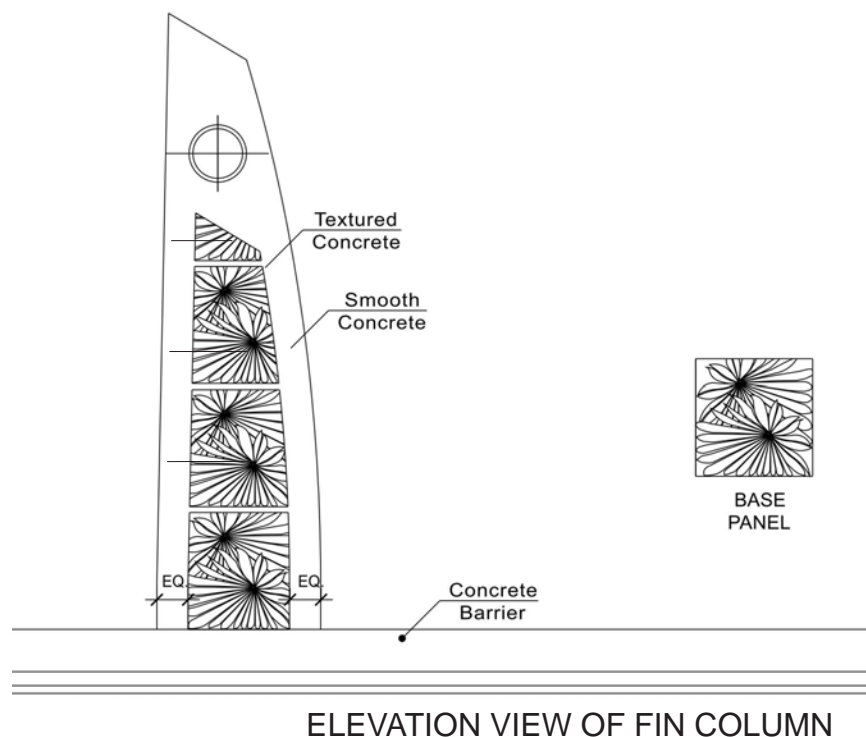
NOTE:
-IMAGES FOR DESIGN INTENT ONLY

Signage Structure:

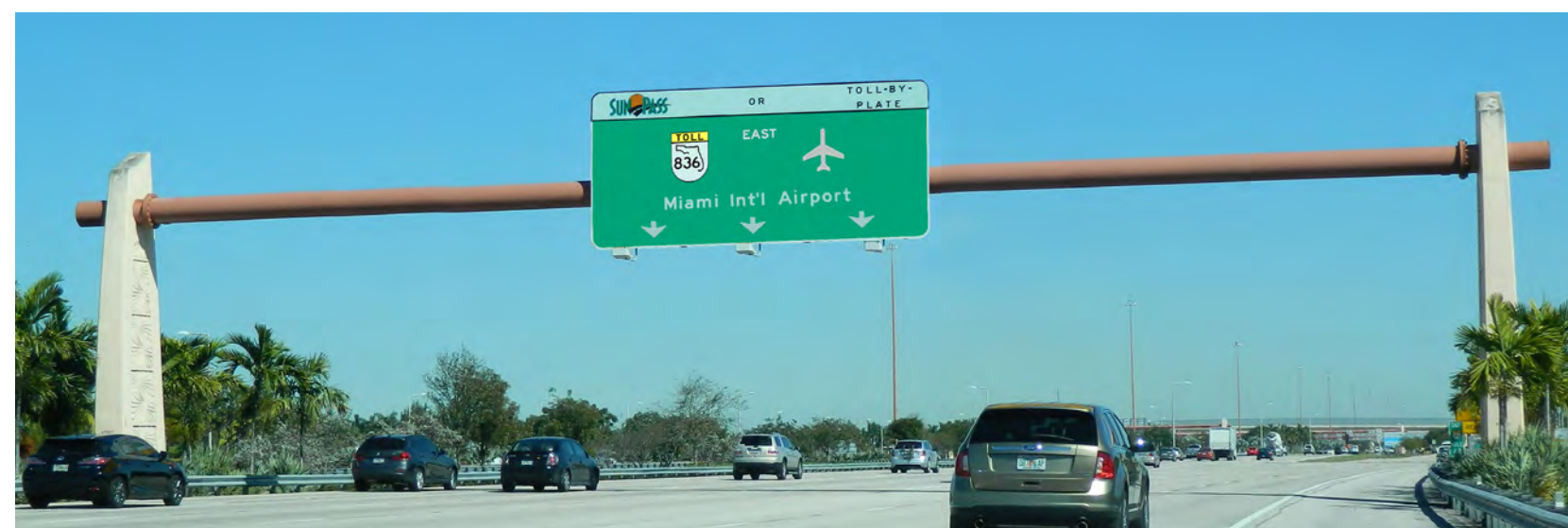
All cantilever, butterfly, and overhead signage structures and the finish of the structures shall comply with the aesthetic design intent of this Manual. The column shall be constructed of concrete with a smooth finish, except the reveal which shall have a Concrete Accent Finish A. The reveal shall occur on both sides of the sign structure. The horizontal support for the sign panels shall be constructed of a round steel tube with no tapers. Any splices that may be needed to fabricate the steel tube shall be located behind the sign panels. The color selection for the Class 5 Finish or mineral based paint finish that shall applied to the surface of the column shall be selected from the Color Palette for Concrete and Glazed Concrete Surfaces that is part of this Manual. The color selection for the horizontal support shall be selected from the Color Palette for Metal Surfaces that is part of this Manual.



EXAMPLE OF 874 CORRIDOR SIGNAGE



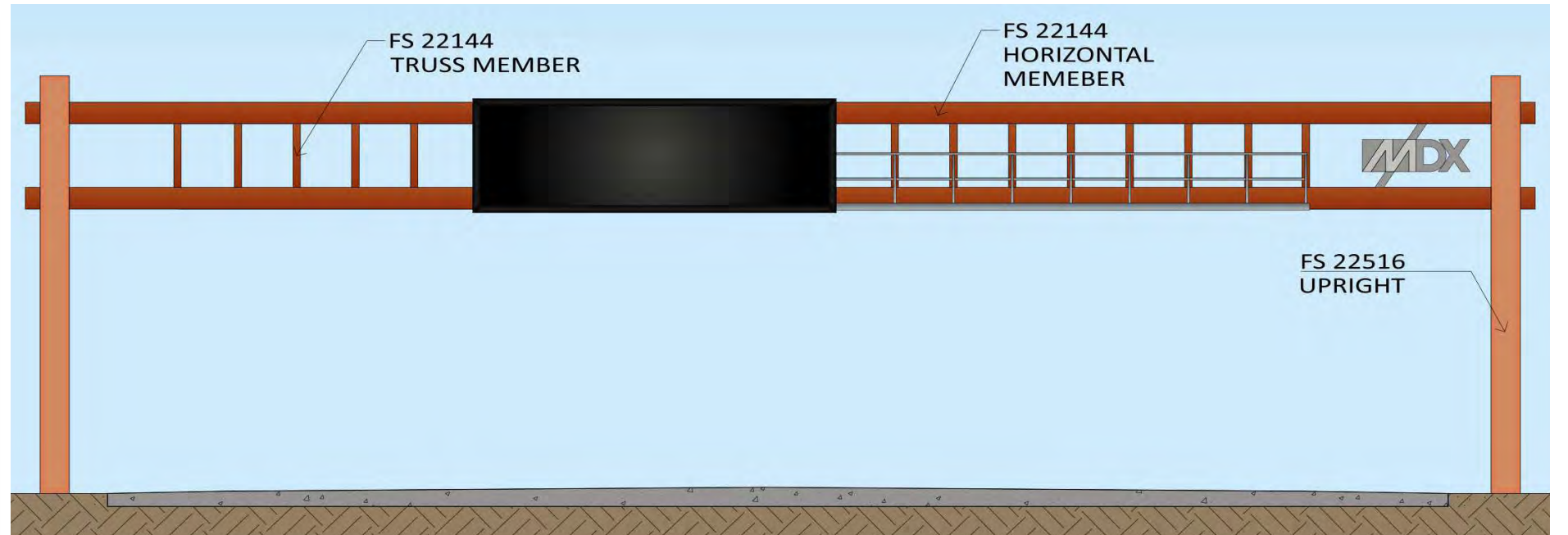
NOTE:
-IMAGES FOR DESIGN INTENT ONLY



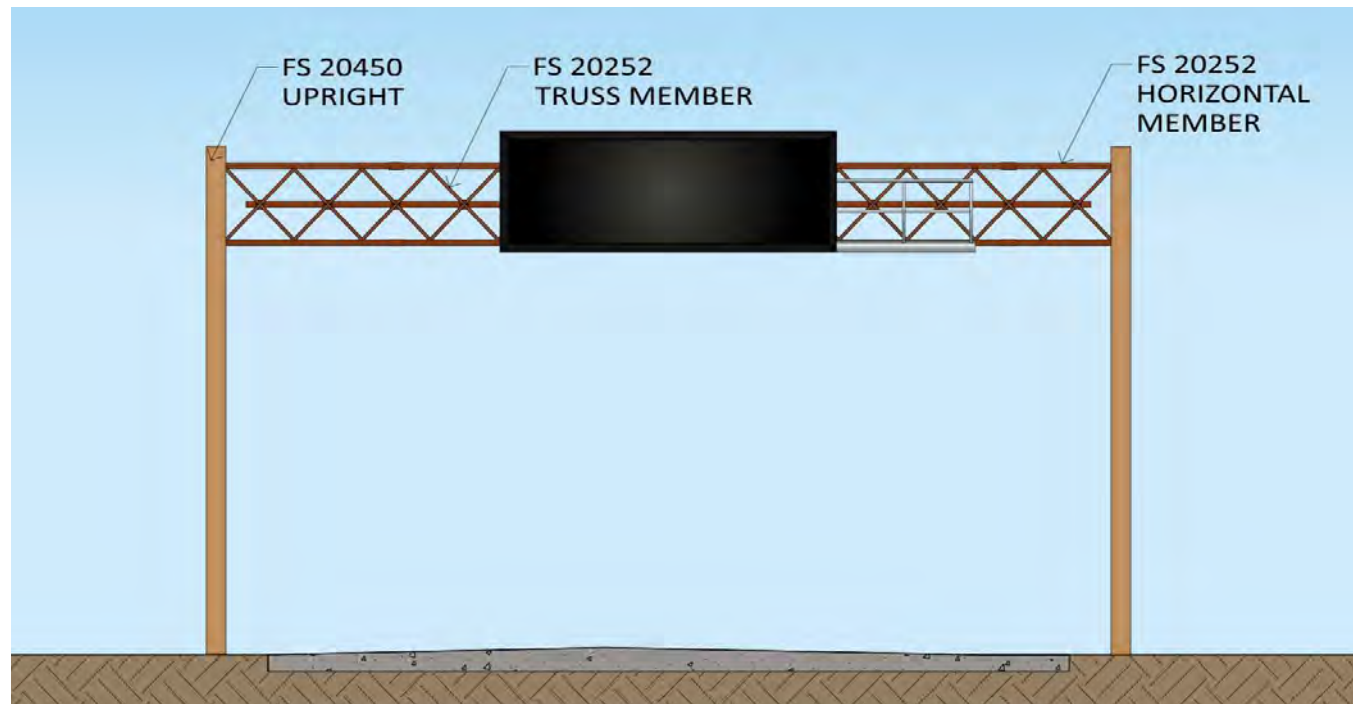
EXAMPLE OF 836 CORRIDOR SIGNAGE

DMS Structures

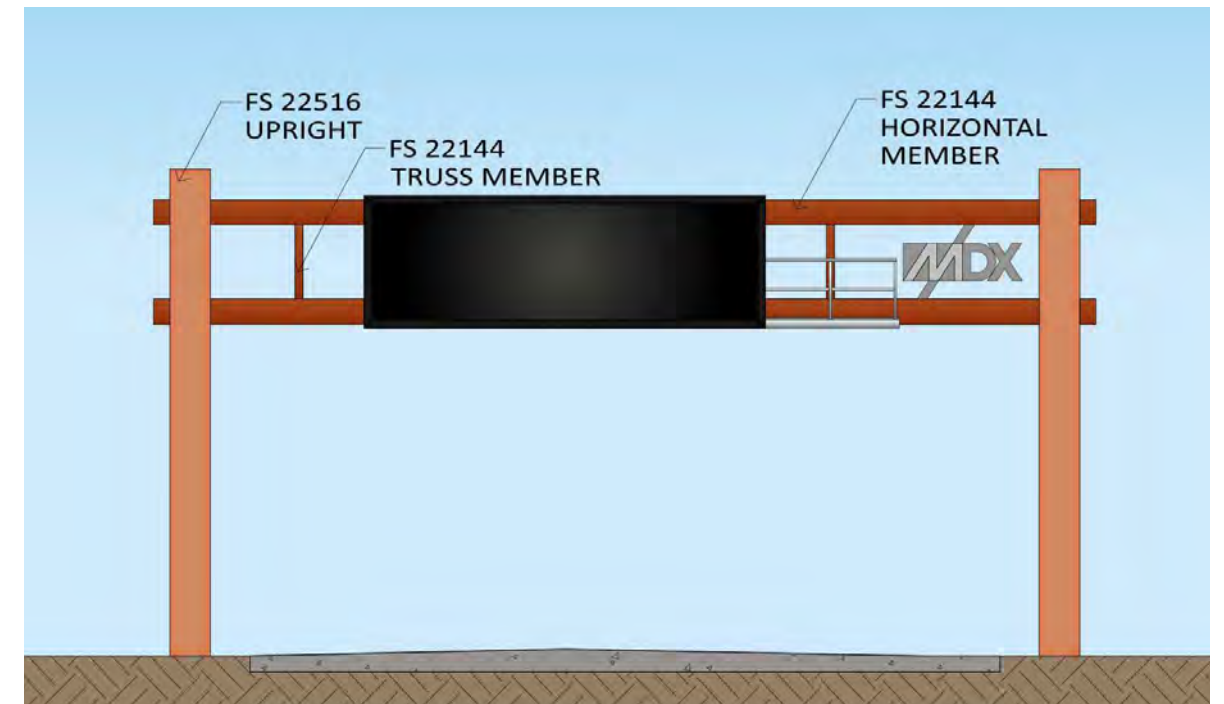
All DMS structures and the finish of these structures shall comply with the aesthetic design intent of this Manual. The design of the structure shall comply with the FDOT design requirements. The color selection for all structural members shall be as listed in the enclosed rendering and as listed in the Color Palette that is part of this Manual. Refer to the project specific requirements for additional documentation regarding the DMS panel. Access to the DMS shall be via a stainless steel catwalk with code-required handrails and perforated walkway grating.



EXAMPLE OF 874/878 DMS

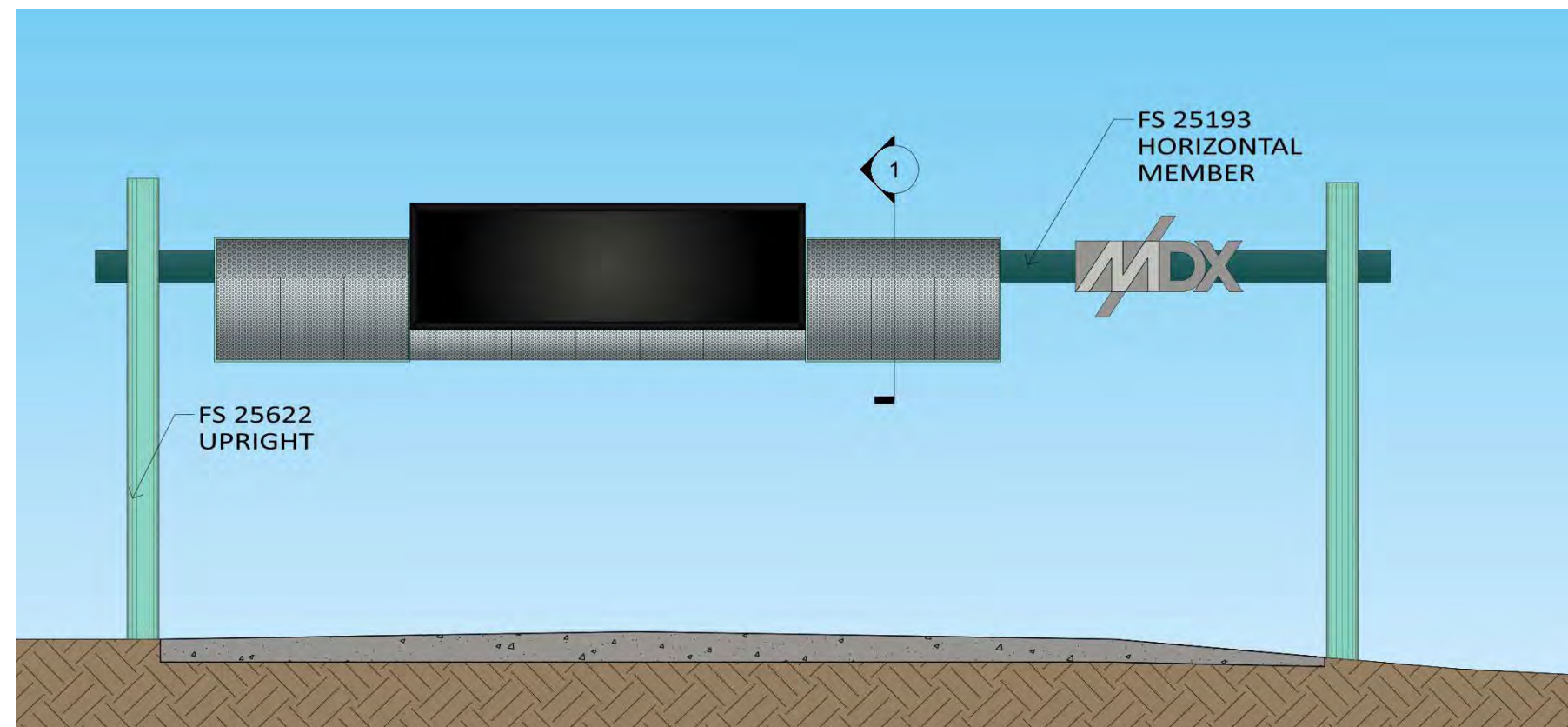


EXAMPLE OF 836 DMS

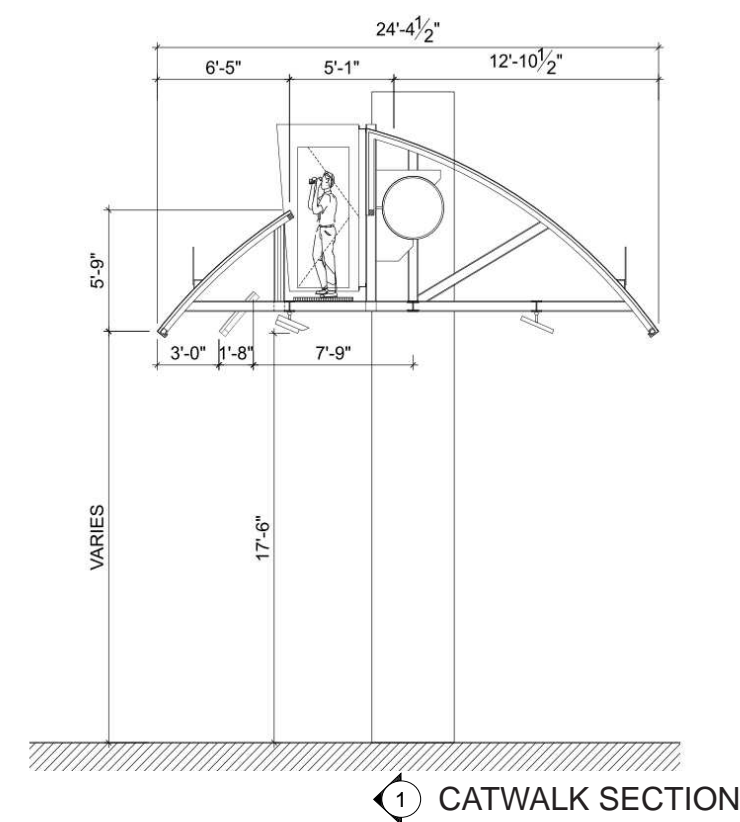


EXAMPLE OF 874/878 DMS

NOTE:
-IMAGES FOR DESIGN INTENT ONLY



EXAMPLE OF 112 DMS



NOTE:
-IMAGES FOR DESIGN INTENT ONLY

Color Palette

The color selection for all elements of hardscape features including bridges, columns, MSE walls, noise walls, ORT structures, DMS structures, and sign structures for MDX roadways shall be selected from the MDX Color Palette. The color palette has been selected from colors in the Federal Standards 595C color palette. The color selection for new projects shall relate to and respect the color selections made for prior projects abutting the new project so that there is an aesthetically pleasing transition. The color selection shall respect the character of the neighboring community and the landscape palette selected for the project. The color selection for similar type concrete elements and metal elements shall be one consistent color within the project to reinforce the design intent. Color selections for all concrete and metal surfaces for any project should be limited to the colors listed in this page. In the case of accent finishes, the color selections should be made from the Dark or Medium Color Chart. Color selections for all projects shall be submitted in the design phase for preliminary approval by MDX. Field applied paint samples of the selected color are subject to final approval by MDX. The colors samples shown in this manual are a graphic representation of the actual colors and may vary slightly from actual colors. Refer to Federal Standard samples for true color rendition.

Surface Treatments

Concrete

All standard concrete surfaces should be treated with a fine texture Class 5 finish from the Florida Department of Transportation Qualified Products List. All accent concrete finishes shall be treated with Keim Mineral Systems Concrete Royalon or an approved equal.

Metal

All structural steel surfaces shall be painted per FDOT specifications

SR 112



FS 25193

SR 836



FS 20252

SR 924



FS 20252

SR 874



FS 22144

SR 878



FS 22144



FS 25299



FS 20450



FS 20450



FS 22516



FS 22516



FS 25622



FS 23690



FS 23690



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NOTE:

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Lighting

I. LUMINAIRE: Lumec-Schreder or an equivalent Luminaire that satisfies the following design and functional specifications:

The luminaire shall be UL and CSA rated with an IP66 rated sealed optical system. It shall be a horizontal lamp with an adjustable horizontal tenon mount. The luminaire shall provide roadway optics/photometrics.

HOUSING: Housing shall be die-cast aluminum. The luminaire housing shall be protected by a chemical etching of the surface followed by the application of a polyester powder coat.

TENON ATTACHMENT: The galvanized steel attachment shall fit tenons from 1 1/2" to 2 3/8" diameter. The components shall work together to allow for a full $\pm 10^\circ$ adjustment of the luminaire. A removable gasket shall be provided to prevent birds or foreign material from entering the housing.

LAMP: Type and wattage shall be as required to comply with project requirements.

VOLTAGE: As per Project requirements.

BALLAST POWER TRAY: All ballast components shall be mounted on a unitized ballast power tray secured to the housing by a hinge. All electrical connections shall be made with UL and CSA recognized quick-disconnect polarized terminals.

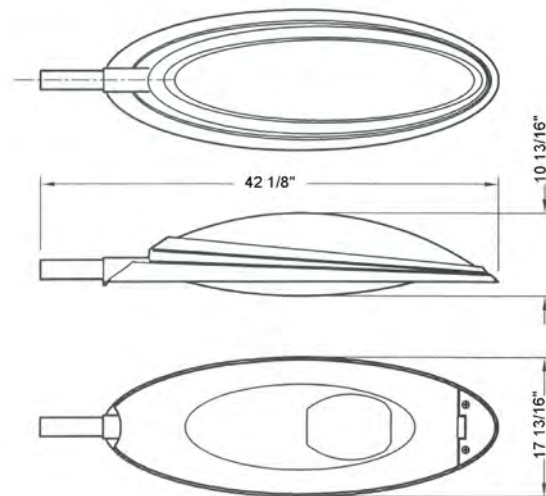
BALLAST: The UL or CSA recognized HPS ballast (self-transforming or insulated secondary type) shall operate within ANSI trapezoidal limits. The HPS ballast shall have a -40° F (-40°C) lamp-starting capacity, a high-power factor and a primary 10% regulation of lamp power. The ballast type shall be constant wattage autotransformer (CWA).

OPTICS: The optical system shall be a sealed optical chamber consisting of a hydroformed reflector permanently sealed on a sagged tempered-glass lens, medium cut-off (Type III) or medium semi cut-off (Type III). Refer for FDOT Roadway lighting criteria and the project specific requirements for additional information.

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FINISH: Color shall be light grey. The luminaire shall have a corrosion resistant coating, double fuse and fuse holder, shorting cap (single phase only), quick-disconnect starter and anti-vibration features.

POLE: Round tapered aluminum with transformer base. The pole shall be an aluminum pole with a six (6) foot aluminum arm. The shape and dimensions of the luminaire shall be as shown below.

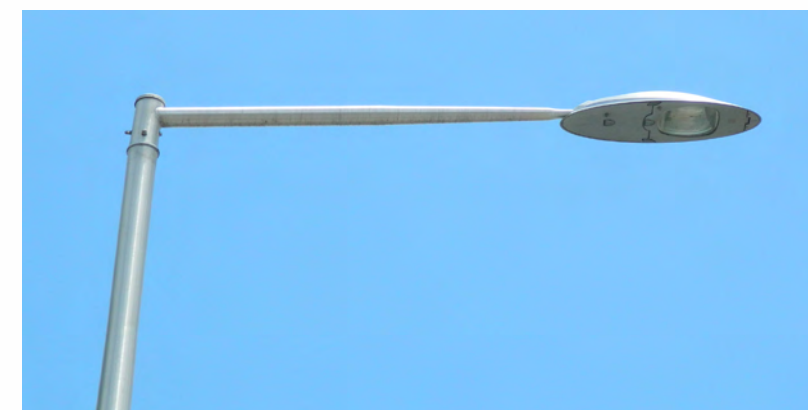
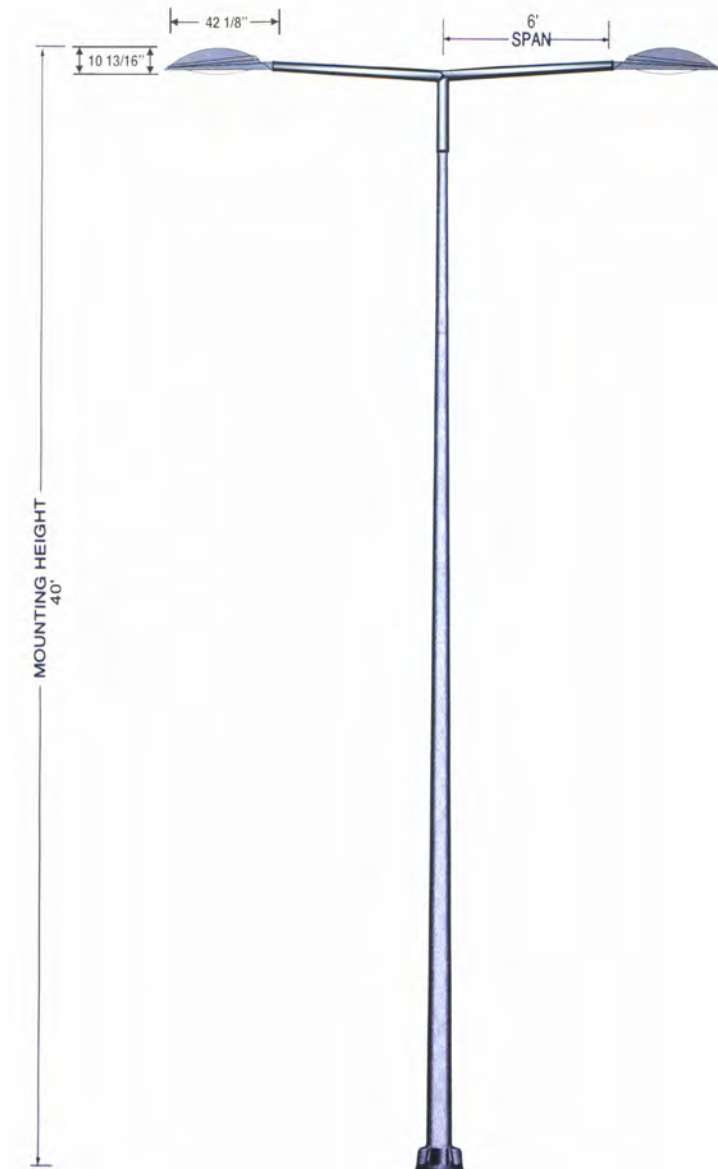


II. Proposers can base their bids on an equivalent, but unnamed fixture, as long as the product meets the salient design and functional characteristics listed/shown above. These characteristics are all an essential part of MDX's minimum needs for the Project. The proposed MDX lighting standard shall be used throughout the MDX System, making consistency and compatibility an important issue. The lighting fixture has been chosen for its standard of quality and is not intended to limit competition.

III. The information regarding the Hestia Luminaire is:

MANUFACTURER: Lumec-Schreder

APPROVED EQUIVALENT: Phillips-Lumec Capella CPLM-400HPS-TH3



Fencing and Gates:

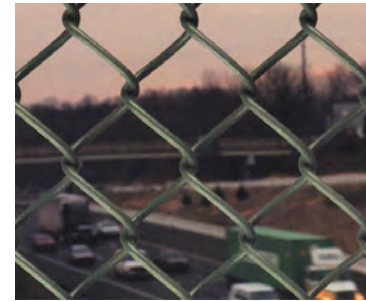
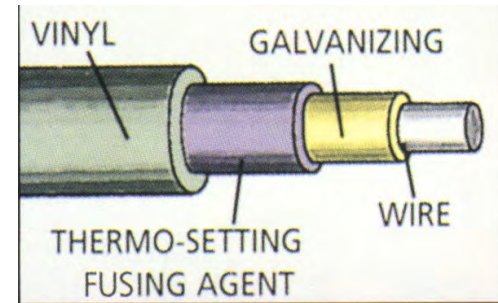
All fencing and gates shall meet the specifications in this manual. The locations of Fence 1 shall be as indicated in the Design Criteria for this project, as indicated in FDOT Standards or as directed by MDX. All new MDX roadway projects shall have Type B Florida Department of Transportation, black vinyl coated aluminum chain link fencing and gates or approved equal. All rail, post, cap and tension wire elements of the fencing shall have black powder coating.

Fence 1

FDOT Type B Vinyl-Coated Aluminum Chain Link Fence (or approved equal)

HEIGHT: 6' Standard

FINISH/COLOR: Black Vinyl Coated Fabric/ Black Post & Cap/Black Rail Brace & Tension Wire



EXAMPLE OF FENCE 1



EXAMPLE OF FENCE 1

Fence 2

FDOT Type U Aluminum Picket Fence (or approved equal)

HEIGHT: 6' Standard

FINISH/COLOR: Powdercoated/Black

Specialty Fencing-Garden Wall

Garden walls should be used for a visual buffer in narrow rights-of-way where wider vegetative buffers are not possible. All garden walls should comply with the design intent of Greenscreen or an approved equal. Alternative designs may include other materials such as concrete posts and the use of trellis construction materials like aluminum that are conducive to the South Florida climate. In all cases the wall shall include the use of vines to provide a visual buffer and flowering effect. The color finish for the material surface of garden walls shall be selected from the color palette included in this manual.

Resource: Greenscreen

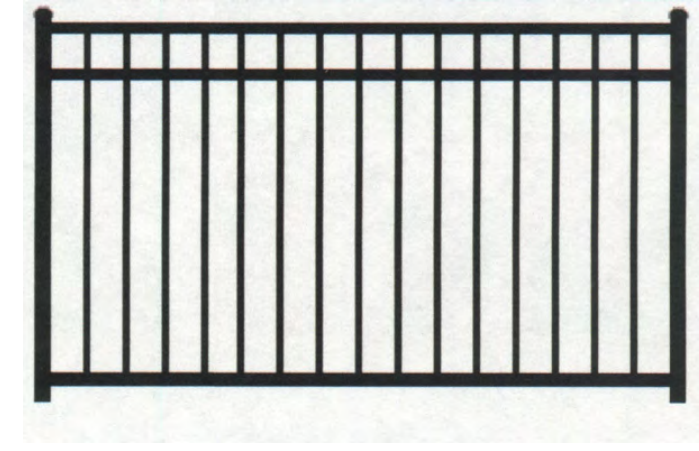
1743 S. La Cienega Blvd. Los Angeles, California 90035-4650

Telephone: 800-450-3494

www. Greenscreen.com



EXAMPLE OF FENCE 2



EXAMPLE OF FENCE 2



EXAMPLE OF GARDEN WALL



EXAMPLES OF GARDEN WALLS

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Ground Surface Treatment / Under Bridge

Ground surface treatments may be used under bridges within the MDX right-of-way to provide a finished appearance to the roadway and intersecting arterial as specified in the project design criteria. The ground surface treatments under bridges should be selected based on the height of the bridge structure, the shadow cast by the bridge structure at various times of the day and the availability of rainwater or irrigation. Selections should be made from the alternative treatments included in this Manual.

1. STANDARD CONCRETE

FINISH: Standard concrete may have broom or rock salt finish



2. GRAVEL / STONE

TYPES: Limestone or decorative stone framed with standard or color concrete paving bands or curbing. All gravel or stone shall be installed with filter fabric with a min depth of 4".



NOTE:
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3. GROUND COVER / LOW SHRUBS

TYPES: Vegetation selection shall be based on existing ecosystems or new conditions, as well as sunlight and water availability.



4. CONCRETE PAVERS

MANUFACTURER: Belgard (www.belgard.com/products) or approved equal.

STYLE: Holland Stone

SIZE: 4"x4", 4"x8", 6"x6", 12"x12"

COLOR: Shall be determined from MDX Color Palette

NOTE: Sub-base of well compacted aggregate material shall be provided to support traffic loading. Perimeter of pavers should be framed with 8"x24" 3000 PSI Reinforced Concrete Ribbon Curb.



5. PERVIOUS CONCRETE PAVERS

MANUFACTURER: Belgard (www.belgard.com/products) or approved equal.

STYLE: Eco-Holland Stone

SIZE: 4"x4", 4"x8", 6"x6", 12"x12"

COLOR: Shall be determined from MDX Color Palette

BENEFIT: Pervious pavers provide improved drainage with the look of traditional pavers.

NOTE: Sub-base of well compacted aggregate material shall be provided to support traffic loading. Perimeter of pavers should be framed with 8"x24" 3000 PSI Reinforced Concrete Ribbon Curb.



6. COLORED CONCRETE

TYPES:

INTEGRAL CONCRETE: For new structures and pavements.

STAINED CONCRETE: For existing-in good shape structures and pavements.

COLOR: Color concrete colors shall follow the MDX color palette

FINISH: Rock salt or broom finish.

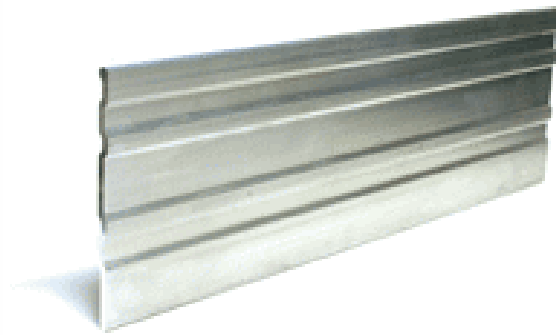


7. EDGING

MANUFACTURER: Permaloc (www.permaloc.com) or approved equal.

STYLE: CleanLine XL

BENEFIT: Ridged aluminum edging is durable and provides a containment edge for concrete pavers and gravel beds.



8. TERRAWALKS

MANUFACTURER: Terrecon (www.terrecon.com) or approved equal.

DESCRIPTION: Interlocking Pavement system/Concrete sidewalk alternative.

BENEFIT: Interlocking system reduces stormwater run-off, impact to trees, and drip hazards.



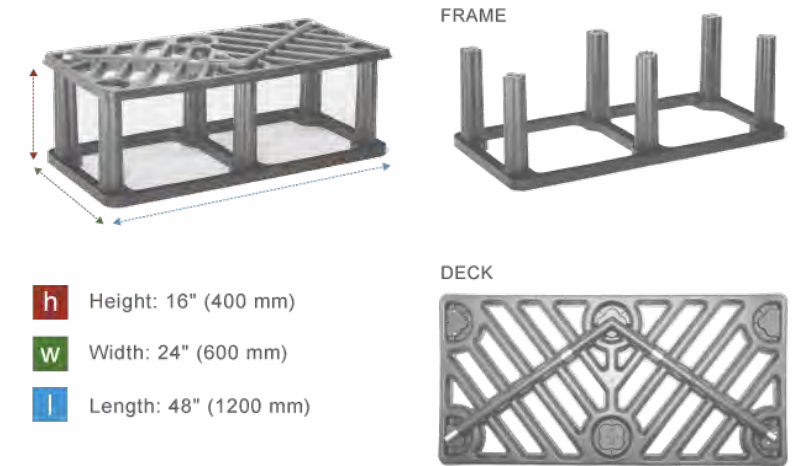
9. SILVA CELL

MANUFACTURER: DeepRoot (www.deeproot.com) or approved equal.

ALTERNATIVE: Structural Soil

DESCRIPTION: A modular suspended pavement system that holds lightly compacted soil while supporting heavy traffic loads beneath paving.

BENEFITS: The healthy soil housed within provides non-compacted room for tree roots to grow. Non-compacted soil increases drainage and stormwater filtration.

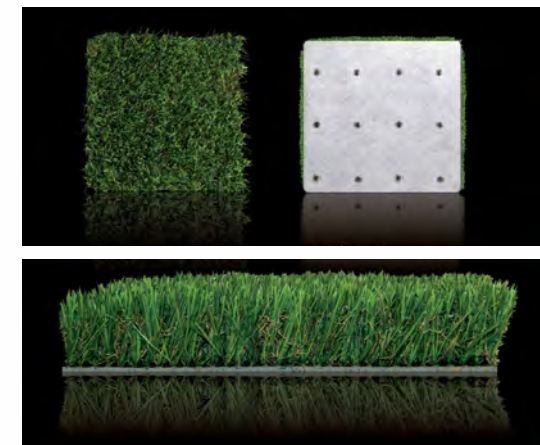


10. ARTIFICIAL SOD

MANUFACTURER: DuPont (www.foreverlawn.com/select) or approved equal.

STYLE: Select HD, or Select VD

BENEFIT: For use in locations where grass is desired that are not suitable for live grass



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Landscape Design Guidelines

The landscape design intent for all MDX projects should promote these landscape concepts that define the South Florida Region:

- Indigenous plant palettes shall be used in natural masses that are appropriate to the environmental conditions of the roadway.
- Native tree canopy shall be increased responding to the suburban and urban requirements of the MDX system.
- Xeriscape planting principles shall be used to conserve water in the landscape.
- Invasive exotic plant material that threaten our few remaining native plant communities shall be removed.
- The amount of turf grass areas that require regular mowing should be reduced and natural masses of native trees, shrubs, and groundcover shall be increased.
- Landscape planting plans should respect the neighboring urban and suburban characteristics of Miami-Dade County.
- Landscape plans should reduce the impacts of the daytime and nighttime visual effects of the highway on abutting land uses.

Landscape designs within the MDX rights-of-way should have bold concepts that provide a sense of continuity throughout the MDX system. The aesthetic hierarchy within the system will be defined through components of the enhancement program; however, the landscape palette will be one of the most important visual elements. The landscape treatment of suburban and urban rights-of-way should have similar plant palettes; however, the plant material will be used in informal and formal designs responding to the specific conditions of the roadway.

Suburban Right of Way



Native plant palettes within the wider suburban areas of the highway should be planted in informal patterns that closely resemble native vegetative growth patterns. Masses of canopy trees and appropriate understory shrubs and ground cover should define these areas. The long-term goal within the suburban areas should be the minimization of large expanses of turf grass areas that require frequent and extensive mowing outside of the clear zones. Groundcover, wildflower and native grass planting should be established as part of the landscape design schemes within the roadway corridors. Outside clear zone turf grass areas, native plant masses should be defined by soft, curvilinear shapes that resemble native plant habitats.

Native plant masses along the edges of the right-of-way should provide buffering of negative view corridors abutting the right-of-way. These plant masses will serve to buffer negative views of the highway from neighboring land uses. Positive view corridors from the highway should be developed for areas outside the right-of-way that have attractive views. Landmark areas of regional interest should also be focal points when establishing positive view corridors along the highway. Irrigation systems may be used only in the interchanges of the suburban roadway sections. The interchanges should utilize the native palette in a more formal design approach. The design of the interchanges should signify a transition area to the driver as well as provide portals to the communities abutting the roadway. Mature tree and palm plant masses should be utilized in the interchange areas, as they are focal points for the system and the community

There are substantial numbers of existing trees and palms at intersections in many areas of the system that should be considered as the basis for landscape designs. The locations and relationship of the existing trees and palms should be studied to assess whether or not they will provide a unified and organized landscape design for the roadway. In the process of roadway renovations the interchanges often become areas for storm water retention ponds. The wet or partially wet/dry character of the ponds will require specific plant palettes that can withstand these conditions. The existing vegetation in many cases may not meet the requirements of the planting criteria for drainage and may not meet the aesthetic goals of this manual. The landscape design team should assess the aesthetic value of existing vegetation in conjunction with long-range aesthetic goals and drainage requirements for the roadway.

Suburban Right of Way

Native plant palettes should also define the urban sections of the MDX system with formal landscape design including trees, palms and low growing shrubs, groundcover and native grasses. Native plant masses that include large and medium shrubs should be used when they have enough depth to be opaque and may be appropriate where buffering for abutting land uses is necessary. Medium and large shrub planting may not be appropriate in an urban setting when open eye level vistas are important for vehicular site distances and safety concerns.

The clear view zone setbacks define planting areas that are thin and linear within the interchange landscapes. These planting areas should consist of formal tree and palm masses with low growing shrubs, ground cover or grass. Typically areas for landscaping in urban interchanges have minimal areas for landscaping. These interchange areas should incorporate bold planting concepts that respect the site distance and clear zone restrictions as well as hardscape structures. Mature tree and palm canopies should be utilized in these highly visible community portal areas. Interchange landscape design should be developed to accommodate public art features, hardscape features and community signage. Use of distinctive native and exotic drought tolerant groundcover will provide interesting accents that define the interchange and celebrate the urban fabric.

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Unpaved areas under bridges that are heavily shaded and not conducive to plant growth should have hardscape paving treatments to provide a clean finish appearance. Irrigation may be included in the urban intersections to maintain the quality and character of the plant installation in the harsh urban condition.

View Corridors

Drivers perceive the landscape character of an urban highway from their vehicles moving at 60 miles per hour or more. Simple, bold landscape concepts should form the basis for designs that are understood by the driver as intentional, easy to understand and not distracting. The length of time that a view corridor is perceived should establish the framework for the landscape design. With design speeds of 60 miles per hour, the elements of color, form and texture should be carefully addressed in the landscape design process. Some important sections of the landscape may have sweeping panoramic views that should be substantial enough to be viewed for a minimum of five seconds at the design speed. Fleeting views of narrow focal points that are not to be perceived as important should be visible for less than one second at the design speed.

The landscape concept should also enhance the quality of the user's view by buffering disparate land uses from the view corridor. The landscape design should provide visual buffering of the roadway for neighboring properties impacted by the highway. Where the right-of-way permits, dense masses of native plant masses should buffer views of commercial activity, utility areas, and construction activity. Landscape vegetative buffers should be at a minimum 20' wide to provide an adequate buffer. Within an urban system it is often not possible to provide a wide enough area for vegetative buffers. In these locations other landscape features like berms or decorative hardscape features like garden fences, walls or public art elements should be incorporated to direct the eye to another ground plane focal point. In some cases hardscape noise walls may be necessary to mitigate the audible impacts of the roadway. Where the right-of-way width permits, landscaping should respond to the design of the noise wall.

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Clear Recovery Zone Requirements

All planting plans shall respect the clear recovery zone requirements as established by the Florida Department of Transportation Plans Preparation Manual.

Intersection Sight Distances

All planting for intersections shall respect the site distance requirements as established by the Florida Department of Transportation Design Standards, Index 546, Sight Distances for Intersections.

Utilities



All planting design should respect the existing and proposed utilities within the corridor that are above and below ground. As a general rule large trees or palms should not be planted under any utility lines while small trees, palms and shrubs that can be easily pruned may be used under utility lines. Tree planting must allow for adequate setbacks from both above and below ground utilities, which should meet following standards:

Plant Material Selection

Native plant species are critical to the South Florida ecosystem and are important assets in highway landscaping. MDX has a long-term commitment to increasing native plant habitat and tree canopy within the highway system. Existing native species that are in good condition should be identified early in the design process and should become features of future design. Native plant material is widely available on a commercial basis and when used in the proper location should provide a thriving landscape solution.



South Florida plant species have evolved to withstand the varying drought and rainy season conditions of the region. Selecting the appropriate native plant species and placing them in appropriate locations should establish a landscape that thrives in our environmental conditions and beautifies the roadway. Plant masses should follow the sequence and organization of the appropriate native habitat in both formal and informal applications. The selection of plant material for the majority of all projects should be made from the Native Plant Lists that part of this Manual. The Landscape -Hardscape Schematic plans for all projects should indicate if their are any acceptable locations within the project for selections from the Exotic Plant List that is part of this Manual.

Xeriscape Principles



All planting design should comply with Xeriscape plant principles and methods that are encouraged by Florida Statutes Chapter 335.167, State Highway Construction & Maintenance; Xeriscape Landscaping within Rights-of-Way. FDOT, Rule Chapter 14-40, Highway Landscape Improvements and FDOT, Rule Chapter 14-92, Florida Highway Beautification Council. Water conservation is critical to South Florida and as such all landscape improvements should be self sustaining. Water consumption in landscape can be reduced from 30-80% by employing Xeriscape Principles that shall include:

Utilizing drought tolerant native and exotic adapted vegetation in appropriate groupings based on water requirements.

Improving soil conditions with organic matter that provides beneficial nutrients and increases the soil's ability to retain water.

Designing efficient irrigation systems that utilize run off within landscape areas.

Utilizing drought tolerant turf and native grasses in rights-of-way clear recovery zones.

Using organic mulch to help retain water, reduce weed growth, and slow erosion.

Xeriscape requires a regular consistent maintenance program that avoids drastic conditions like over fertilizing or over watering that affect the root growth of vegetation.

Vegetation Quality

All plant material specifications shall meet the minimum standards required by the FDOT Standard Specifications for Road and Bridge Construction, Section 580 and any other requirements in this Manual and the project design criteria. All plant material should meet or exceed the minimum standards of Florida



Number 1 or better according to the most recent edition of the Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants, Part I and II. All horticultural nomenclature must be used according to L.H. Bailey, Hortus Third, 1976. General minimum standards for new plant material to be used within the MDX system should meet the following criteria:

Large Shade Trees- 14'-16' height and 9'-12' spread with 5' of clear trunk

Medium Trees- 10'-12' height and 5'-6' spread with 4' of clear trunk

Large Palms- 24'-26' overall height and 18'-20' spread

Small Palms- 10'-12' overall height and 9'-10' spread

Small Trees/Large Shrubs- 6'-8' height, 4'-6' spread

Medium Shrubs-36"-48" height and spread

Groundcover- 18"-36" height and spread

Vines- 24"-36" height and spread

Trees and Palms

Recommended minimum spacing for trees at intersections shall meet the Florida Department of Transportation Sight Distance at Intersection criteria as per Index 546. The horizontal location of trees and palms shall be per FDOT Index 700 Roadside Offsets. Outside the clear zone areas, spacing for shade trees and large palms should be at a minimum 15'-20' on center and for ornamental trees and small palms at a minimum 10'-15'



on center. When trees or palms are planted any closer than these minimums, a shrub or ground cover plant bed should be placed under the canopy of the tree mass so that mowing is not necessary. Based on clear zone requirements of the roadways large informal masses of trees and palms should be at a minimum 200' long and should be separated by view corridors of at least 1/3 of the length of the massing. Formal linear masses of trees or palms should be at the maximum 500' long and at the minimum 200' long and should be separated by view corridors of at least 1/3 the length of the linear grouping. Potential damage to paving by root systems should be considered in the location and selection of species and may require the specification of root barriers based on the proximity of hardscape elements. Trees and palms should not be planted on slopes greater than 1:2. Native masses of trees should be of species diversity replicating the typical habitat unless specified in the Landscape and Hardscape Schematics for the project. Exotic trees should be used in masses of the same species type for visual impact.

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Shrubs and Groundcover

Spacing, selection and location of shrubs and groundcover shall meet the minimum Florida Department of Transportation standards for sight distance at intersections as per Index 546. The perception of plant masses



is minimal at highway speeds and the most aesthetically pleasing effects should be achieved with large, uniform plant beds. Shrub and groundcover masses should also relate to the rhythm of tree and palm canopy and view corridors. Informal native understory shrub and groundcover masses at interchanges and roadways should replicate the species diversity of the habitat unless specified as monoculture in the Landscape and Hardscape Schematics. Formal masses of monoculture exotic shrub, groundcover and vines should be used only at interchanges for visual impact. All shrub and groundcover masses on slopes should be continuous from the top of slope to the toe of slope in all cases. Installed plant spacing should provide solid masses of vegetation at maturity.

Turf Grasses

The horizontal clearance requirements necessitate large masses of turf areas along roadways and interchanges. The use of turf grass other than in the clear safety zone



areas should be minimized and the use of groundcover, low shrub masses and wildflowers should be maximized. Turf that may require mowing as often as twelve times a year should be replaced with large masses of native trees, shrubs, grasses and groundcover that do not require mowing. Horizontal radii for turf edges should not be smaller than 10 feet. The width of turf areas should be in multiples of 4 feet for the most efficient mowing patterns. All landscape plans should include specific delineation of mow lines for the project. In most cases the suburban roadways will be seeded with a 50% Bahia grass and 50% Bermuda mix. A turf grass like St. Augustine 'Palmetto' may be utilized where groundcover is not appropriate in the more urban interchanges that have irrigation systems.

Native Grasses, Sedges and Rushes

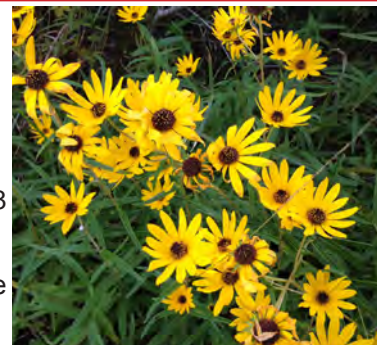
Native grasses, sedges and rushes shall be used in the landscape plans for the MDX system specifically in wet and dry pond drainage applications. These native plants have minimal maintenance requirements



once established and should provide contrast to mown exotic grasses and native shrub masses. The delineation of No Mow areas will be required and is critical to the success of native grasses, sedges and rushes. All landscape plans should specifically include locations of No Mow lines delineating these plant beds so that they can be field located with an unobtrusive marking system. Maintenance personnel should be instructed as to the significance and locations of No Mow lines so that the native grasses, sedges and rushes can reach their intended heights.

Wildflowers

Similar to grasses, sedges and rushes the benefits of wildflowers are evident in the comparison of 3 times per year mowing as opposed to 12-18 times per year for turf grass.



Wildflower installations should include the following species used in the appropriate location as recommended by the Florida Department of Transportation for Miami-Dade County:

Botanical Name

Gaillardia puchella
Gaillardia aristata
Helianthus debilis

Common Name

Indian Blanket
Blanket Flower
Dune Sunflower

Prohibited, Controlled, and Protected Plant Species

MDX roadway projects shall be planned and developed in accordance with the Miami-Dade County Code. Relevant code sections include Section 33-11, Chapter 18A Landscape Ordinance; Miami-Dade County Department of Planning and Zoning Landscape Manual; Miami-Dade County Department of Environmental Resources Management Section 24-60, Trees and Forest Resources.

Surveys and Protection of Existing Trees and Palms

Current tree surveys will be provided including genus, species, common name, height, spread of canopy, diameter at breast height, and ground elevation at base of trunk. In many cases tree removal and transplanting may be needed to meet the geometric requirements of new roadway design, drainage requirements and also the aesthetic goals of this Manual. Tree and palm removals and transplants are subject to the permitting and canopy replacement requirements of Section 24-60 of the Miami-Dade County Code. Specimen trees and palms that are to remain should be protected during the roadway construction phase according to the standards developed by the Florida Division of Forestry. These standards include providing protective tree barriers around the canopy of the tree outside the drip line based on the Critical Protection Zone (CPZ) requirements and protecting trees and palms from soil compaction by heavy equipment.

Tree and Palm Removals and Transplants

Within the MDX system, many existing trees and palms may need to be removed due to expansion of the roadways. The survey of the existing trees and palms should be analyzed by the Landscape Architect to determine the quantities, condition and viability of transplanting versus removal. It may be



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more cost effective to remove and replace the canopy of small, non-native trees and palms with new nursery grown plant material. Existing large non-native palms which are more costly to replace and are typically easy to transplant should be relocated to new locations within the right-of-way.

In all cases, every effort shall be made to maintain specimen native trees and palms in their existing location within the right-of-way. Specimen trees are considered those with a trunk diameter at breast height of 18" or greater. The intrinsic value and canopy of specimen native trees is certainly not equivalent to even twice the replacement canopy with new nursery grown trees that is required by Miami-Dade County. If there are no viable alternatives for maintaining specimen native trees or palms in their existing location then transplanting the tree within the MDX right-of-way should be the next viable alternative. If a specimen tree worthy of transplanting cannot be located to a final location within the MDX roadway system, the tree should be offered to a public school or public park within the community abutting the MDX roadway. An arborist certified by the National Arborists Association or the American Association of Consulting Arborists should be obtained by the Design Build team or Contractor to determine the health, structural condition and viability of all specimen trees prior to designation and approval by MDX as a removal or transplant.

All tree and palm transplanting must be done in accordance with standards established by the National Arborists Association or the American Association of Consulting Arborists and shall be performed under the supervision of a certified arborist. Trees and palms may not survive transplant if they are not given proper care prior to, during and after the transplanting process. Proper root pruning should take place six to eight weeks prior to transplanting to insure survival of specimen trees and palms. Trees that are proposed for transplanting should be only moved once to their final location. It is not desirable to temporarily locate and maintain trees in holding areas during the construction process.

Construction Phase Tree Pruning

Trees within the MDX system should be left to grow naturally with pruning occurring only when dead limbs or fronds appear and when encroachment is lower than 15 feet over clear zones.

In no cases should crown reduction or hat racking be allowed on MDX roadways to provide view corridors for billboards. Any tree or grouping of trees should be removed from the right-of-way if the trees are subject to existing FDOT permits for billboard view corridors that requires crown reduction or hat racking for visibility of billboard. All tree and palm pruning and removal should be in accordance with standards established by the National Arborists Association or the American Society of Consulting Arborists.



Soil Characteristics and Amendments

Prior to the installation of all landscaping within the system the contractor should obtain a soil analysis of the existing site and planting soil that will be brought to the site. The soil and drainage characteristics will determine the plant palette that is suitable for the roadway and also the organic amendments that may have to be added to the existing soil to support plant growth. This is particularly important in drainage areas that will have wetland and dry retention pond species introduced.

Mulch

All plant installations within the MDX system except wetlands species shall require the use of mulch to retain moisture in the soil. Cypress mulch should not be used in any location within the highway system. Only natural color organic mulch that is not the byproduct of the destruction of native plant species should be used. Mulch should be installed in all plant areas and should not exceed a depth of 3 inches.

Geotextile Weed Barriers

In certain shrub and groundcover applications where slopes exceed 3:1 and access for landscape maintenance is difficult geotextile/weed barriers should be installed. Polypropylene weed barriers should reduce the need for chemical herbicides and aid in the control of the growth of unwanted weeds.



Fertilizer, Herbicides and Pesticides

All landscape plans should include fertilizing requirements as part of the specifications prepared for the project. The MDX system does not promote the use of chemical herbicides and pesticides. Control of unwanted plant material must be considered as part of the landscape design process.

Root Barrier

In roadway and urban conditions tree roots that may crack the concrete sidewalks and asphalt roadways. In most locations along the roadway the clear zone requirements will keep trees and roots sufficiently away from asphalt or concrete paving. In buffer locations abutting bridges, MSE walls or noise walls trees may be planted relatively close to the structure. In this case the landscape plans should include the use of a mechanical barrier/root barrier that will deflect root growth away from the structure.

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Irrigation

Within the MDX system irrigation may be utilized for interchange locations in both urban and suburban areas. In narrow median areas subsurface irrigation systems should be designed for tree, palm, shrub, and groundcover areas. Larger landscape areas should use conventional irrigation heads and rotary type heads must be used in turf areas. Low trajectory type heads should be used in areas susceptible to high wind conditions. Irrigation components within the system should be grouped with similar precipitation rates. Height of pop-up sprinklers should be appropriate for the function, 6" for turf and 12" for shrubs and groundcover. In all cases where irrigation is used, 100% coverage should be provided and the system should not over spray into sidewalks, roadways or any paved surface. Water sources for irrigation of roadway areas should pump water from wet retention ponds if feasible. Irrigation mainlines should be looped where feasible and cover over pipes shall consist of a minimum of 18" of soil. Lateral lines downstream of the mainline shall have cover of a minimum of 12". All irrigation systems should include the installation of a rain sensor and meet all other requirements of Miami-Dade County Plumbing and Electrical Codes. Water use permits may be necessary and should be consistent with all the requirements of the South Florida Water Management District regulations. Electric power will be necessary for all irrigation and electric controllers and pumps must be located as unobtrusively as possible within the interchange. The irrigation system should be monitored electronically on a daily basis to determine leaks and irregularities in the system.



Every effort should be made to avoid the need for irrigation systems. All new roadway designs should consider that the plant material be able to survive and thrive without irrigation. Only locations near facilities should be considered for irrigation, and then only if the design mandates a need for it.

Landscape Specifications

All landscape projects developed for the MDX system should include detail specifications prepared by a Landscape Architect and at a minimum meet the requirements of the Florida Department of Transportation. The landscape specifications should address the following conditions:

DESIGN MAINTENANCE INTENT SPECIFICATIONS:

- Technical references and definitions
- Quality assurance
- Definitions
- Submittal requirements
- Delivery, storage and handling
- Job site conditions
- Job sequencing
- Contractor warranty
- Contractual maintenance procedures
- Material standards
- Transplanting procedures
- Planting procedures
- Soil preparation
- Plant bed and sod area preparation
- Sod installation procedures
- Seeding installation procedures
- Adjustment, sod reconditioning and cleanup
- Inspection and acceptance procedures

The following lists are provided to guide the designer in the use of preferred material based on the specific area. Considering the majority of new landscaping will be installed post roadway construction, the area of design should consider the base material, the urbanized level of adjacent areas current and predicted.

Most often, the most durable plant material, the determining "look" attempting to be achieved, and the overall budget will most likely determine the design which will be a hybrid of native and exotic material.

NOTE:

-IMAGES FOR DESIGN INTENT ONLY

COASTAL UPLANDS

Botanical Name	Common Name
Canopy	
Bursera simaruba	Gumbo limbo
Chrysophyllum oliviforme	Satinleaf
Clusia rosea	Pitch apple
Coccoloba diversifolia	Pigeon plum
Coccoloba uvifera	Seagrape
Conocarpus erectus	Green buttonwood
Ficus aurea	Strangler fig
Ficus citrifolia	Shortleaf fig
Guapira discolor	Blolly
Mastichodendron foetidissimum	Mastic
Nectandra coriacea	Lancewood
Piscidia piscipula	Jamaica dogwood
Quercus virginiana	Live oak
Sabal palmetto	Cabbage palm
Simarouba glauca	Paradise tree
Understory	
Calyptanthes pallens	Spicewood
Capparis cynophallophora	Myrtle of the River
Capparis flexuosa	Limber caper
Chrysobalanus icaco	Cocoplum
Cordia sebestana	Geiger tree
Eugenia axillaris	White stopper
Eugenia confusa	Redberry stopper
Eugenia foetida	Spanish stopper
Eugenia rhombea	Red stopper
Guaiaacum sanctum	Lignum vitae
Krugiodendron ferreum	Black ironwood
Myrcianthes fragrans	Simpson stopper
Myrsine guianensis	Myrsine
Thrinax morrisii	Key thatch palm
Thrinax radiata	Thatch palm
Shrubs	
Ardisia escallonioides	Marlberry
Callicarpa americana	Beautyberry
Psychotria nervosa	Wild coffee
Randia aculeata	White indigo berry
Serenoa repens	Saw palmetto
Groundcover	
Gaillardia artistata	Blanket flower
Gaillardia puchella	Indian blanket
Helianthus debilis	Beach sunflower
Zamia pumila	Coontie

ROCKLAND HAMMOCKS

Botanical Name	Common Name
Canopy	
Bursera simarouba	Gumbo Limbo
Chrysophyllum oliviforme	Satin Leaf
Coccoloba diversifolia	Pigeon Plum
Ficus aurea	Strangler Fig
Ficus citrifolia	Shortleaf Fig
Krugiodendron ferreum	Black Ironwood
Lysiloma latisilquum	Wild Tamarind
Mastichodendron foetidissimum	Mastic
Nectandra coriacea	Lancewood
Piscidia piscipula	Jamaica dogwood
Prunus myrtifolia	West Indian cherry
Quercus virginiana	Live Oak
Simarouba glauca	Paradise tree
Understory	
Ardisia escallonioides	Marlberry
Calyptanthes pallens	Spicewood
Coccoloba diversifolia	Pigeon plum
Eugenia axillaris	White stopper
Eugenia confusa	Redberry stopper
Eugenia foetida	Spanish stopper
Guapira discolor	Blolly
Myrcianthes fraframs	Simpson stopper
Myrica cerifera	Wax myrtle
Myrsine guianensis	Myrsine
Prunus myrtifolia	West Indian Cherry
Tecoma stans	Yellow elder
Shrubs	
Callicarpa americana	Beautyberry
Hamelia patens	Firebush
Psychotria nervosa	Wild coffee
Randia aculeate	White indigo berry
Tetrazygia bicolor	West Indian lilac
Groundcover	
Nephrolepis biserrata	Giant Swordfern
Nephrolepis exaltata	Swordfern
Tripsacum floridanum	Florida gamagrass
Vines	
Peperomia obtusifolia	Oval leaf peperomia

PINE ROCKLANDS

Botanical Name	Common Name
Canopy	
<i>Pinus elliottii</i> var. <i>densa</i>	Dade County Pine
<i>Sabal palmetto</i>	Cabbage Palm
Understory	
<i>Byrsonima lucida</i>	Locust Berry
<i>Coccothrinax argentata</i>	Silver Palm
<i>Forestiera segregata</i> var. <i>pinetorum</i>	Pineland Privet
<i>Randia aculeata</i>	White Indigo Berry
<i>Serenoa repens</i>	Saw Palmetto
<i>Tetrazygia bicolor</i>	Tetrazigia
Shrubs	
<i>Callicarpa americana</i>	Beautyberry
<i>Lantana involucrata</i>	Wild Sage
<i>Myrica cerifera</i>	Wax Myrtle
<i>Myrsine guianensis</i>	Myrsine
Groundcover	
<i>Lantana depreja</i>	Dwarf Lantana
<i>Ruellia caroliniensis</i> subsp. <i>ciliatus</i>	Wild Petunia
<i>Tripsacum floridanum</i>	Florida Gamagrass
<i>Zamia pumilia</i>	Coontie

TRANSITIONAL UPLAND

Botanical Name	Common Name
Canopy	
<i>Ilex cassine</i>	Dahoon Holly
<i>Magnolia virginiana</i>	Sweet Bay
<i>Sabal palmetto</i>	Cabbage Palm
Subcanopy	
<i>Chrysobalanus icaco</i>	Cocoplum
<i>Myrica cerifera</i>	Wax Myrtle
<i>Myrsine guianensis</i>	Myrsine
<i>Serenoa repens</i>	Saw Palmetto
<i>Spartina bakeri</i>	Cord Grass
<i>Tripsacum dactyloides</i>	Fakahatchee Grass
Flowering Plants	
<i>Flaveria linearis</i>	Yellow-top
Ferns	
<i>Blechnum serrulatum</i>	Swamp Fern
<i>Osmunda regalis</i>	Royal Fern

EDGE OF WETLAND/WET POND

Botanical Name	Common Name
Canopy	
<i>Acer rubrum</i>	Red Maple
<i>Annona glabra</i>	Pond Apple
<i>Myrica cerifera</i>	Wax Myrtle
Flowering Plants	
<i>Crinum americanum</i>	Swamp Lily
<i>Hymenocallis palmeri</i>	Alligator Lily
<i>Peltandra virginica</i>	Green Arum
<i>Pontederia cordata</i>	Pickerelweed
<i>Sagittaria lancifolia</i>	Arrowhead
<i>Sagittaria latifolia</i>	Arrowhead
Grasses, Sedges, and Rushes	
<i>Eleocharis cellulose</i>	Spikerush
<i>Eleocharis interstincta</i>	Spikerush
<i>Panicum hemitomon</i>	Maidencane
<i>Scirpus validis</i>	Bulrush
Ferns	
<i>Acrostichum danaeifolium</i>	Leather Fern

FORESTED WETLANDS / DRY RETENTION

Botanical Name	Common Name
Canopy	
<i>Acer rubrum</i>	Red Maple
<i>Acoelorrhaphe wrightii</i>	Paurotis Palm
<i>Ficus aurea</i>	Stranger Fig
<i>Ilex cassine</i>	Dahoon Holly
<i>Persea palustris</i>	Redbay
<i>Roystonea elata</i>	Royal Palm
<i>Sabal palmetto</i>	Cabbage Palm
<i>Taxodium ascendens</i>	Pond Cypress
<i>Taxodium distichum</i>	Bald Cypress
Subcanopy	
<i>Cephalanthus occidentalis</i>	Button Bush
<i>Chrysobalanus icaco</i>	Cocoplum
<i>Myrsine guianensis</i>	Myrsine
Flowering Plants	
<i>Canna flaccida</i>	Canna Lily
<i>Kosteletzkya virginica</i>	Marsh Mallow
Grasses, Sedges and Rushes	
<i>Cladium jamaicense</i>	Sawgrass
<i>Juncus</i> spp.	Rushes
<i>Muhlenbergia capillaris</i>	Gulf Muhly
<i>Scirpus olneyi</i>	Three-square

FLOWERING EXOTICS

Botanical Name	Common Name
Trees	
Bombax ceiba	Red Silk Cotton Tree
Cassia fistula	Golden Shower
Cassia javanica	Apple Blossom Shower
Chorisia speciosa	Floss-Silk Tree
Cochlospermum vitifolium	Buttercup Tree
Delonix regia	Royal Poinciana
Erythrina variegata	Coral Tree
Erythrina indica	Coral Tree
Jacaranda mimosifolia	Jacaranda
Koelreuteria elegans	Golden Shower Tree
Peltophorum pterocarpum	Yellow Poinciana
Pseudobombax ellipticum	Shaving Brush Tree
Spathodea campanulata	African Tulip Tree
Tabebuia sp	Tabebuia
Shrubs	
Acacia farnesiana	Sweet Acacia
Bougainvillea spectabilis	Bougainvillea
Cassia surattensis	Kolomona
Cordia boissieri	Texas Wild Olive
Cordia lutea	Yellow Cordia
Galphimia gracilis	Thyrallis
Groundcover	
Bougainvillea spectabilis 'Dwarf'	Dwarf Bougainvillea
Silhouhette	Ms. Alice
Bromeliads	Green Island Ficus
Lantana montevidensis	Purple Trailing Lantana
Vines	
Allamanda cathartica var. hendersonii	Yellow Allamanda
Bougainvillea spectabilis	Bougainvillea

PALM TREES

Botanical Name	Common Name
Phoenix dactilefera	Date Palm
Phoenix sylvestris	Silver Date Palm
Leucothrinax morrisii	Key Thatch Palm
Thrinax radiata	Silk-top Thatch
Coccothrinax argentata	Silver Palm
Coccothrinax barbadensis	Barbados Silver Palm
Carpentaria acuminata	Carpentaria Palm
Livistona decipiens	Ribbon Fan Palm
Latania sp.	Blue Lattan Palm
Veitchia montgomeryana	Montgomery Palm
Ptychosperma elegans	Alexander Palm
Dypsis lutescens	Areca Palm
Dypsis cabadae	Cabadae Palm
Caryota mitis	Fishtail Palm
Cocos nucifera	Coconut Palm
Chamaerops humilis	European Fan Palm
Sabal minor	Dwarf Palmetto
Bismarkia nobilis	Bismark Palm
Hyophorbe sp.	Bottle Palm
Pseudophoenix sargentii	Buccaneer Palm