

# *FY 2019-20 Standard Plans* Update Training

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## Standard Plans – Primary Index Updates:

- 1) **Index 536-001 – Guardrail**
  - **New** “Trailing Anchorage”
    - Updated Downstream Placement Policy
  
- 2) **Index 521-001 – Concrete Barrier**
  - **New** Barrier-Mounted Sign Support Option – Dual Supports
  - **New** Callouts for “Variable Section Width” Start/Stop Points
  - **New** “Wall Shielding Barrier” & General “Max. Taper Rates”
  
- 3) **Index 521-010 – Opaque Visual Barrier (OVB)**
  - **Redeveloped** Index Sheets for Clarity
    - Durability Improvements
    - Varying Barrier Heights
  - **New** SPI and FDM Section
  
- 4) **Index 544-001 – Crash Cushion Details**
  - **Redeveloped** Index Sheets and SPI for Clarity
  - **Redeveloped** Summary of Permanent Crash Cushion Table
  - **New** Pay Items

## Standard Plans – Primary Index Updates:



### 1) *Index 536-001* – Guardrail

- *New* “Trailing Anchorage”
  - Updated Downstream Placement Policy

## Sheet 9: No More "Type II"!

**INSTALLED ELEVATION**

**SINGLE TRAILING ANCHORAGE INSTALLED PLAN**

**DOUBLE FACE TRAILING ANCHORAGE INSTALLED PLAN**

**END TREATMENT - TRAILING ANCHORAGE, TYPE II**

**NOTES:**

- COMPONENT DETAILS:** For additional Type II component details, See Sheet 10. For Rectangular Washer details, See Sheet 22.
- END UNITS:** Use materials for end units as defined in Specifications Section 967. End Units are referred to as "End or Buffer Sections" in AASHTO M190.
  - a. Excavate, backfill, and compact material to provide full passive soil resistance to all surfaces of the Tube and Soil Plate.
  - b. Drive the Tube and Soil Plate as a single unit using a dummy timber post to prevent damage to the Breakaway Post.
- FOUNDATIONS:** Install Steel Tubes with attached Soil Plates by either of the following methods:
- GENERAL GUARDRAIL:** General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.
- SIDEWALK REQUIREMENTS:** When sidewalks are located adjacent to the End Treatment, install a Rounded End Unit (Flared End Unit not permitted for this case).
 

When sidewalks or shared use paths are within 4'-0" from the backs of posts, use the Timber Post option shown (including the first post in the General Guardrail segment). Install the Pipe Rail for adjacent Steel Posts if used, as shown on Sheet 20.
- END DELINEATOR:** Mount retroreflective sheeting to the approach face of the End Unit in accordance with Specification Sections 536 and 967.

- Soil Plate System Removed
- Rectangular Washers Removed

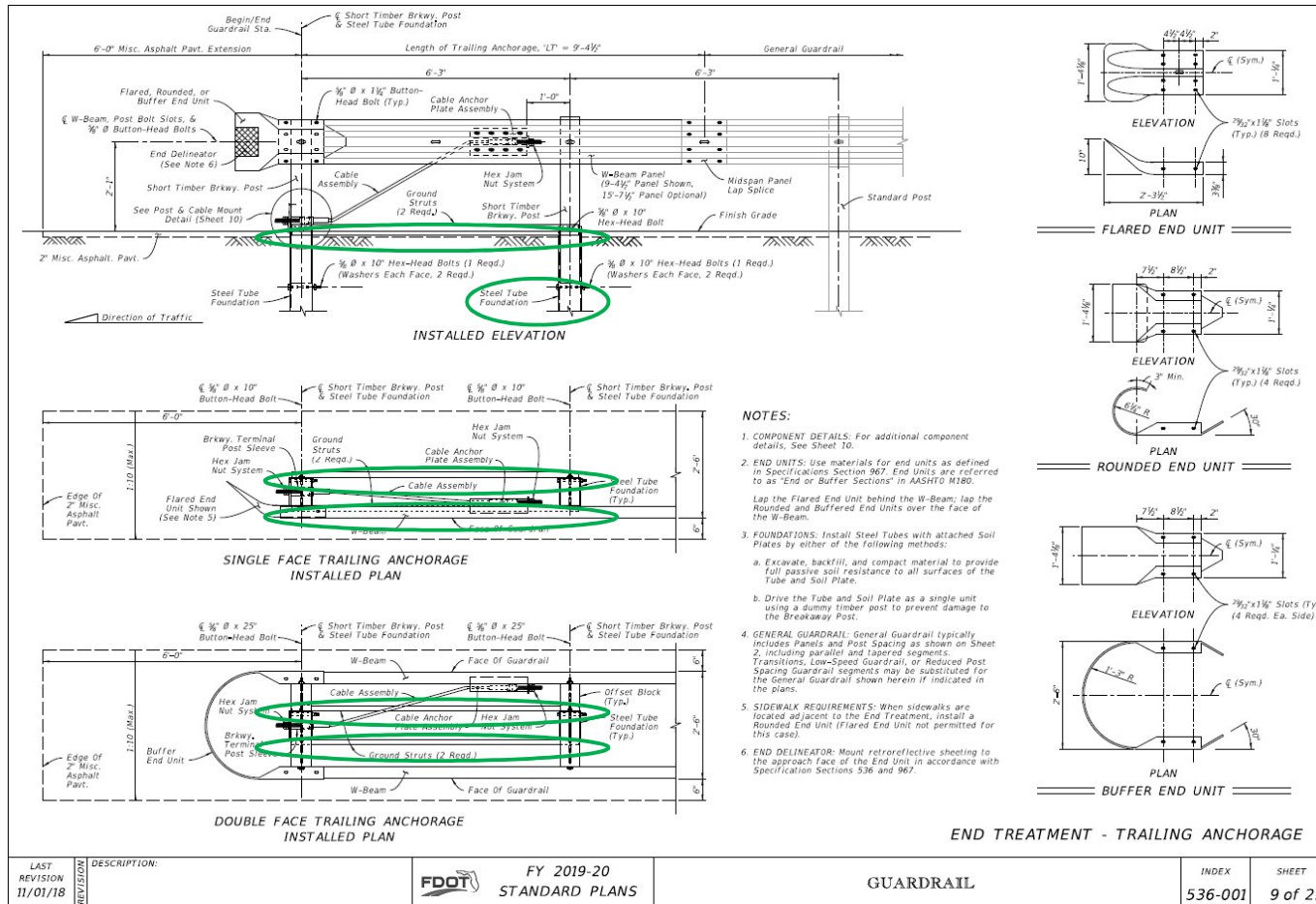
**FLARED END UNIT**

**ROUNDED END UNIT**

**BUFFER END UNIT**

|                           |              |                                      |           |                  |                  |
|---------------------------|--------------|--------------------------------------|-----------|------------------|------------------|
| LAST REVISION<br>11/01/17 | DESCRIPTION: | FDOT<br>FY 2018-19<br>STANDARD PLANS | GUARDRAIL | INDEX<br>536-001 | SHEET<br>9 of 12 |
|---------------------------|--------------|--------------------------------------|-----------|------------------|------------------|

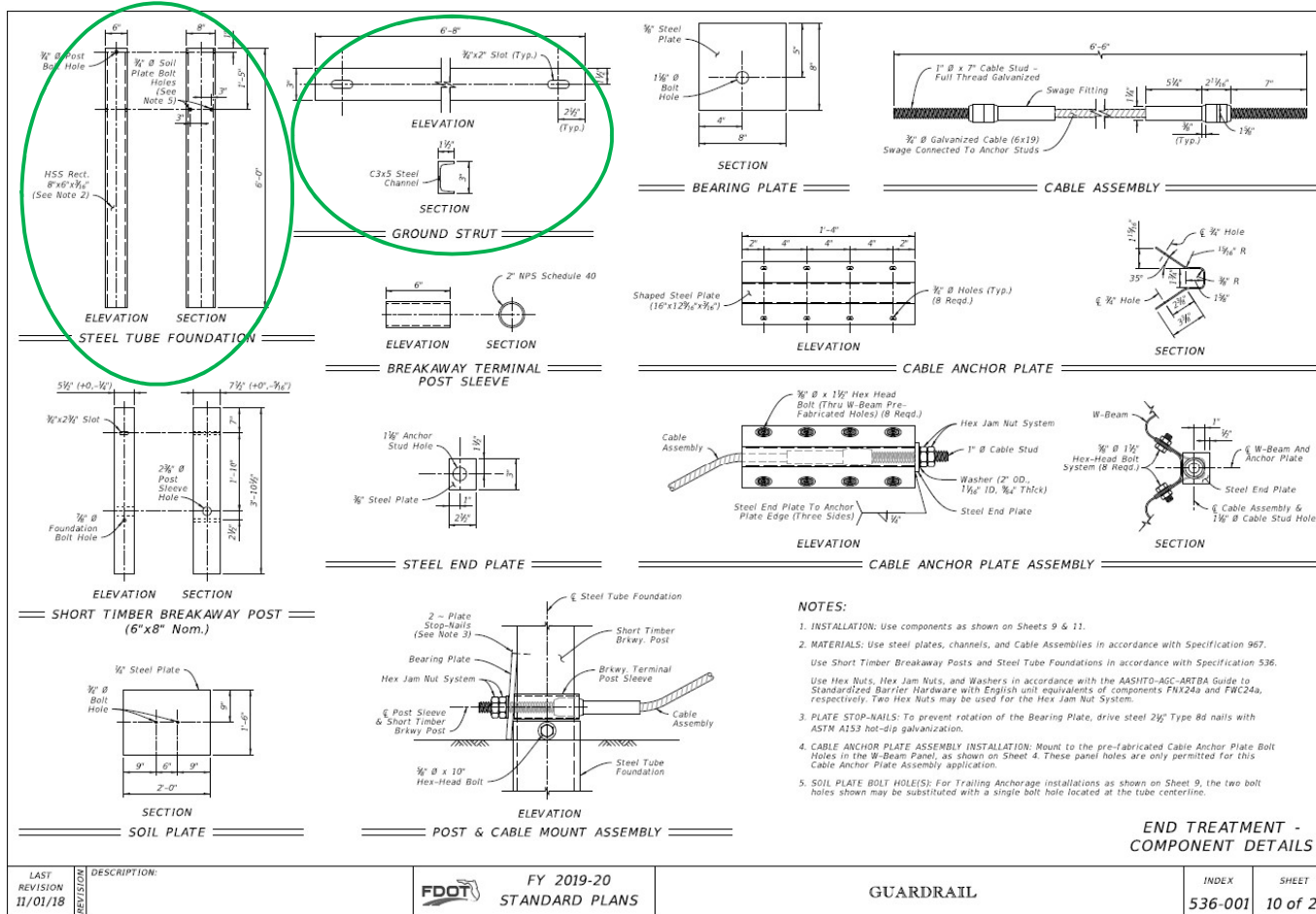
## Sheet 9: **New Trailing Anchorage!**



- New Strut System Added
  - 2 Struts Total (1 Each Side)
- New Short Timber Breakaway Post & Steel Tube Foundation at Post 2
- Changes follow latest designs for MASH, following discussions with MwRSF

|                           |              |                                      |           |                  |                  |
|---------------------------|--------------|--------------------------------------|-----------|------------------|------------------|
| LAST REVISION<br>11/01/18 | DESCRIPTION: | FDOT<br>FY 2019-20<br>STANDARD PLANS | GUARDRAIL | INDEX<br>536-001 | SHEET<br>9 of 22 |
|---------------------------|--------------|--------------------------------------|-----------|------------------|------------------|

## Sheet 10: **New Trailing Anchorage!**



- New Strut System Added
- Steel Tube Foundations lengthened by 1 foot

|                           |              |                                      |           |                  |                   |
|---------------------------|--------------|--------------------------------------|-----------|------------------|-------------------|
| LAST REVISION<br>11/01/18 | DESCRIPTION: | FDOT<br>FY 2019-20<br>STANDARD PLANS | GUARDRAIL | INDEX<br>536-001 | SHEET<br>10 of 22 |
|---------------------------|--------------|--------------------------------------|-----------|------------------|-------------------|

## BOE - DQE: *New Trailing Anchorage!*

536- 85- AA Guardrail End Treatment, EA

AA = Type

Single Face

20 (Trailing Anchorage) effective July 2019 lettings

22 (Flared Approach Terminal) valid through June 2019 lettings

24 (Parallel Approach Terminal)

~~25 (Type II Trailing Anchorage) valid through June 2019 lettings; see AA=20 for replacement~~

26 (CRT End Treatment)

PENDING: ?? (Flared Approach Terminal- NCHRP 350 TL-3) For Maintenance Use ONLY

Double Face

27 (Double Face Approach Terminal)

~~28 (Double Face Type II Trailing Anchorage) valid through June 2019 lettings; see AA=20 for replacement~~

29 (Double Face Trailing Anchorage) effective July 2019 lettings

- New Pay Items in Basis of Estimates (BOE – DQE):
  - 536-85-20
  - 536-85-29



## SPI, Part C: **New Trailing Anchorage!**

Standard Plans Instructions  
Index 536-001 Guardrail

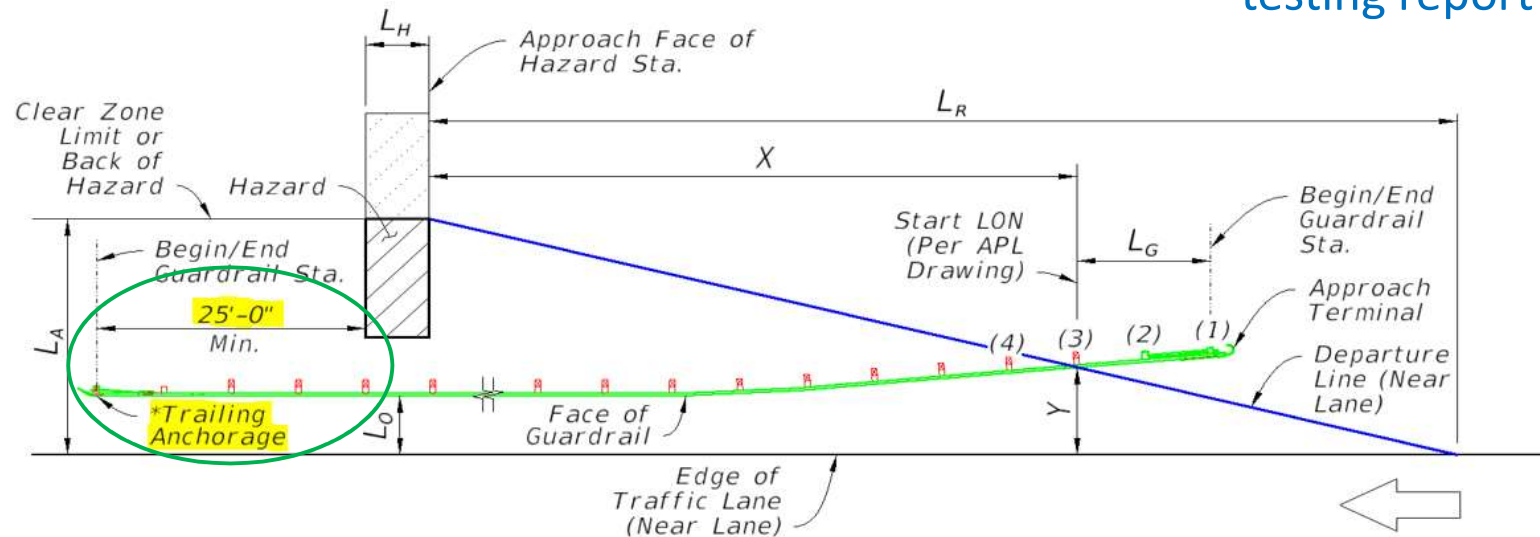
Topic No. 625-010-003  
FY 2019-20

### C. End Treatments:

An End Treatment segment is required for all guardrail ends where the guardrail does not transition into another barrier type (e.g. Approach or Trailing End Transition Connections to Rigid Barrier). End Treatments are divided into three types.

1. **Trailing Anchorages:** Place a Trailing Anchorage on the downstream ends of all guardrail runs with respect to the nearest traffic lane, except where the location is within the Clear Zone of an opposing traffic lane. **Locate the end post of the Trailing Anchorage at least 25 feet downstream of any hazards being shielded.**

- Extend Trailing Anchorage to **25 feet** downstream of hazard being shielded
- Based on latest MASH crash testing report



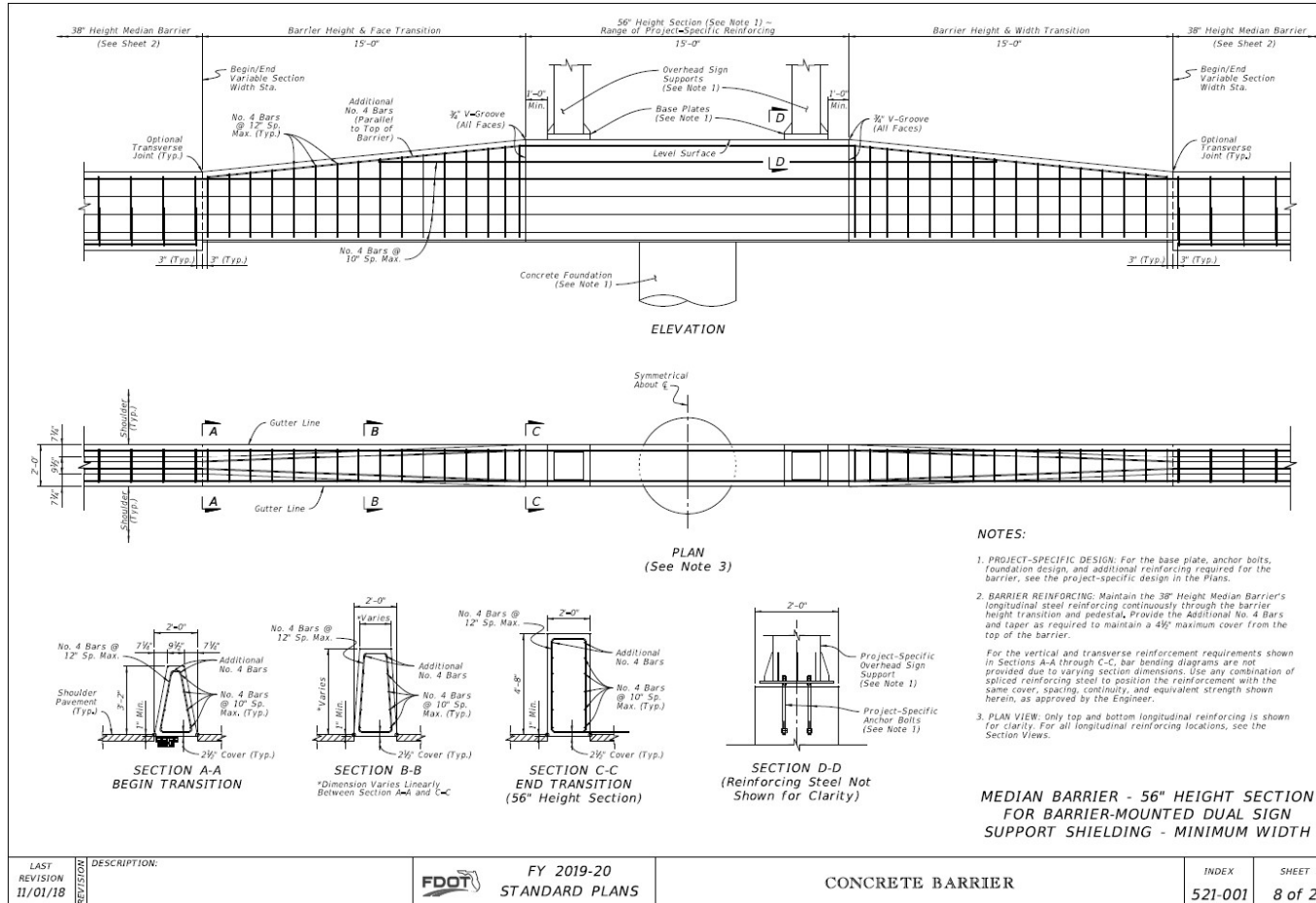


## Standard Plans – Primary Index Updates:

- ✓ 1) **Index 536-001 – Guardrail**
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    - Updated Downstream Placement Policy

- ➔ 2) **Index 521-001 – Concrete Barrier**
  - **New** Barrier-Mounted Sign Support Option – Dual Supports
  - **New** Callouts for “Variable Section Width” Start/Stop Points
  - **New** “Wall Shielding Barrier” & General “Max. Taper Rates”

## Sheet 8: New Barrier-Mounted Dual Sign Supports



- This is an alternative to larger sign supports with barrier widening
- Design is for least use of space
- No shoulder reduction: Barrier Gutter Lines remain at 2 foot barrier width

## BOE - DQE: Variable Section Width Callouts

\*\*\*\*\*

521- 1- A Median Concrete Barrier, LF

A= Type, Single Slope, effective July 2018

11 (38" Height) Symmetrical

12 (Short Grade-Separated)

13 (Tall Grade-Separated)

**14 (Variable Section Width for Sign or Pier Shielding)**

Segments included under -14 pay item:

Median Barrier – 56" Height Section" (with transitions)

Median Barrier – 38" Height Split Section" (with transitions)

Median Barrier – 44" Height Split Section" (with transitions)

- Existing Pay Item – Descriptions now added
- Median Concrete Barrier 521-1-14 is for *double-faced* application

## BOE - DQE: Variable Section Width Callouts

\*\*\*\*\*

521- 72- AA Shoulder Concrete Barrier, LF

40 (38" or 44" Height) Index 521-001

41 (38" Retaining Section) Index 521-001, sheet 14 of 22

42 (38" Trench Footing Section) Index 521-001

43 (38" Curb & Gutter Barrier) Index 521-001

44 (44" Pier Protection Barrier/Crash Wall) Index 521-002

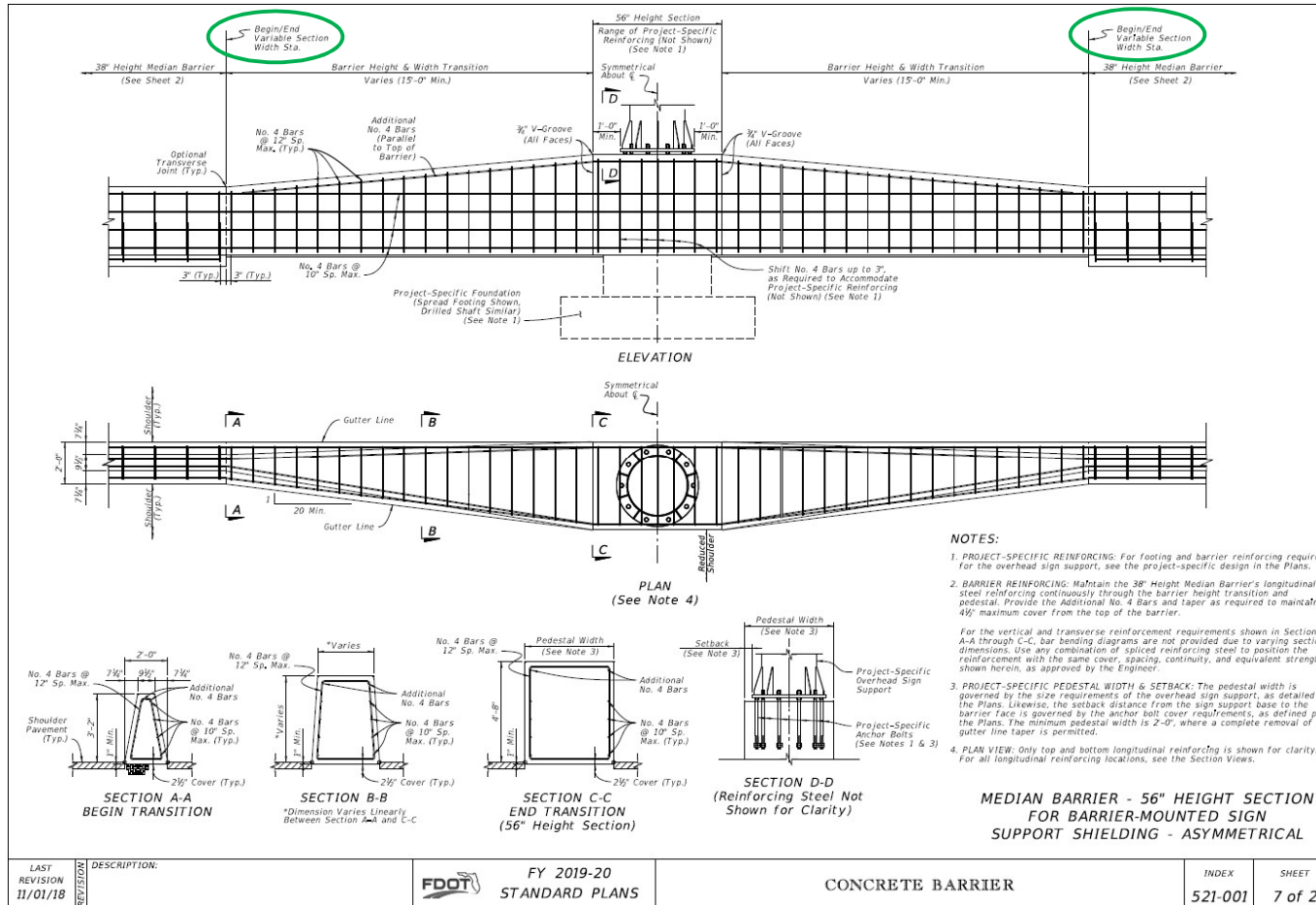
56 (56" Pier Protection Barrier/Crash Wall) Index 521-002

60 (38" Wall Shielding Barrier) Index 521-001, effective July 2019

61 (Variable section width for wall or sign shielding) Index 521-001, effective July 2019

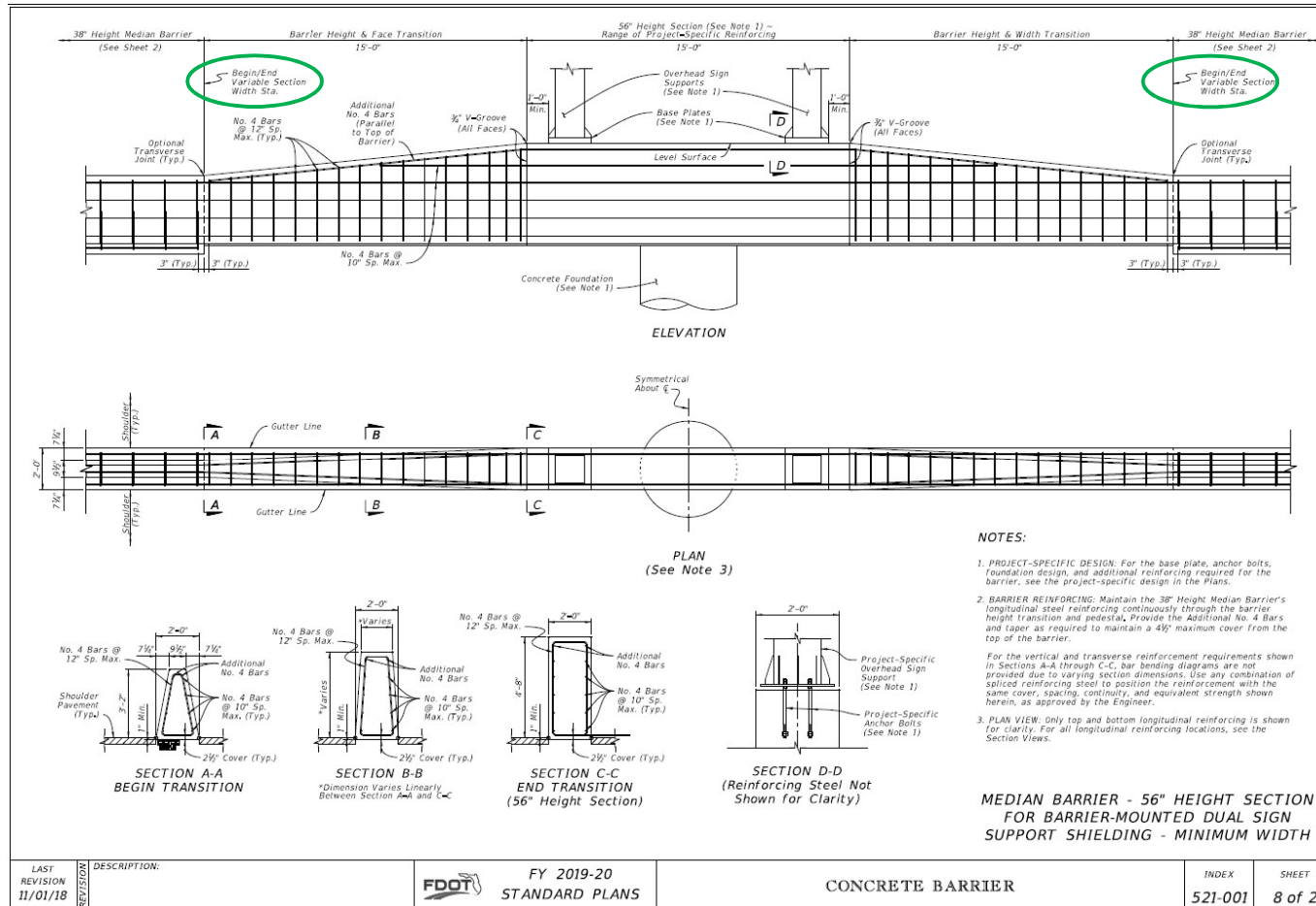
- **New Pay Item** for single-faced Wall Shielding Barrier
- Shoulder Concrete Barrier 521-72-61 is for *single-faced* application

## Sheet 7: Variable Section Width Callouts



- Example of... Variable Section Width Pay Item (Double-Faced)

## Sheet 8: Variable Section Width Callouts

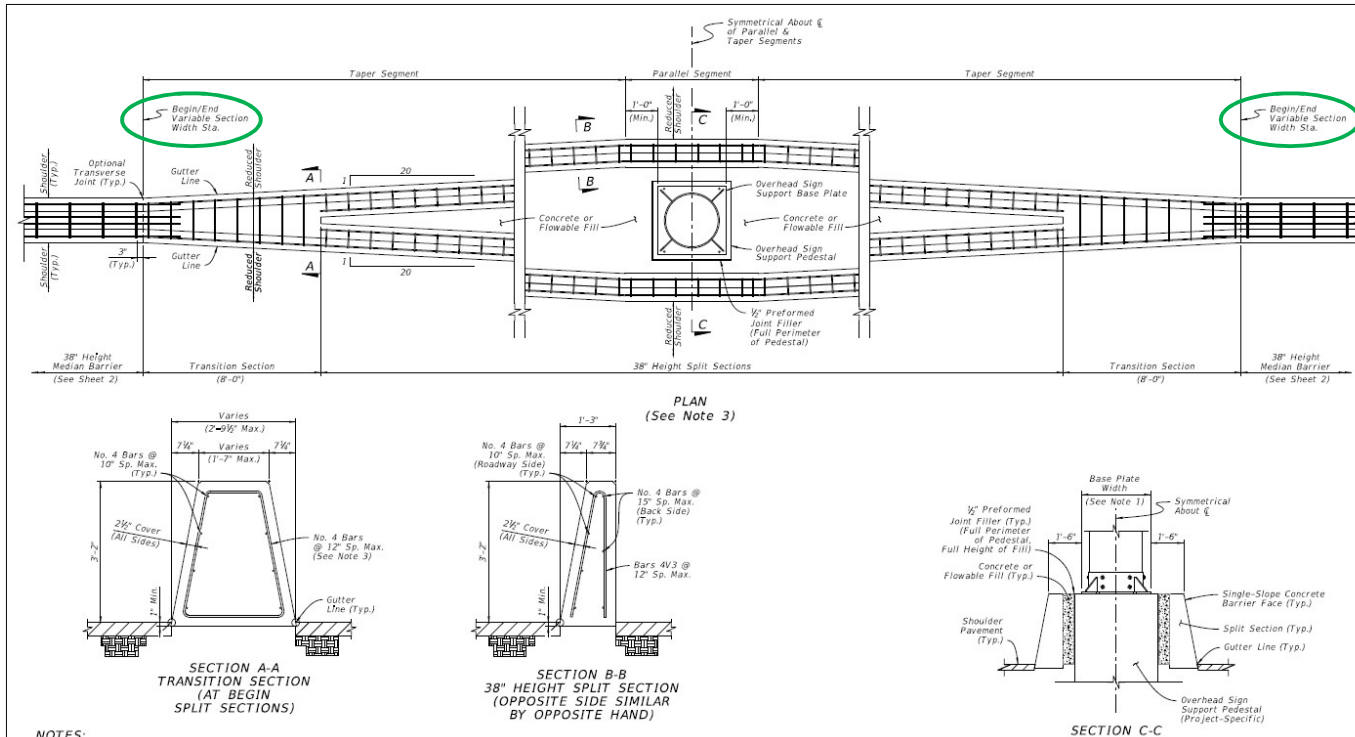


- Example of... Variable Section Width Pay Item (Double-Faced)

**NOTE:**  
Even though gutter line width doesn't change, the barrier face width changes, so the concept still applies.



## Sheet 9: Variable Section Width Callouts



- Example of... Variable Section Width Pay Item (Double-Faced)

**NOTE:** Measurement is along centerline of entire Variable Section Width system per the SPI and Specifications.

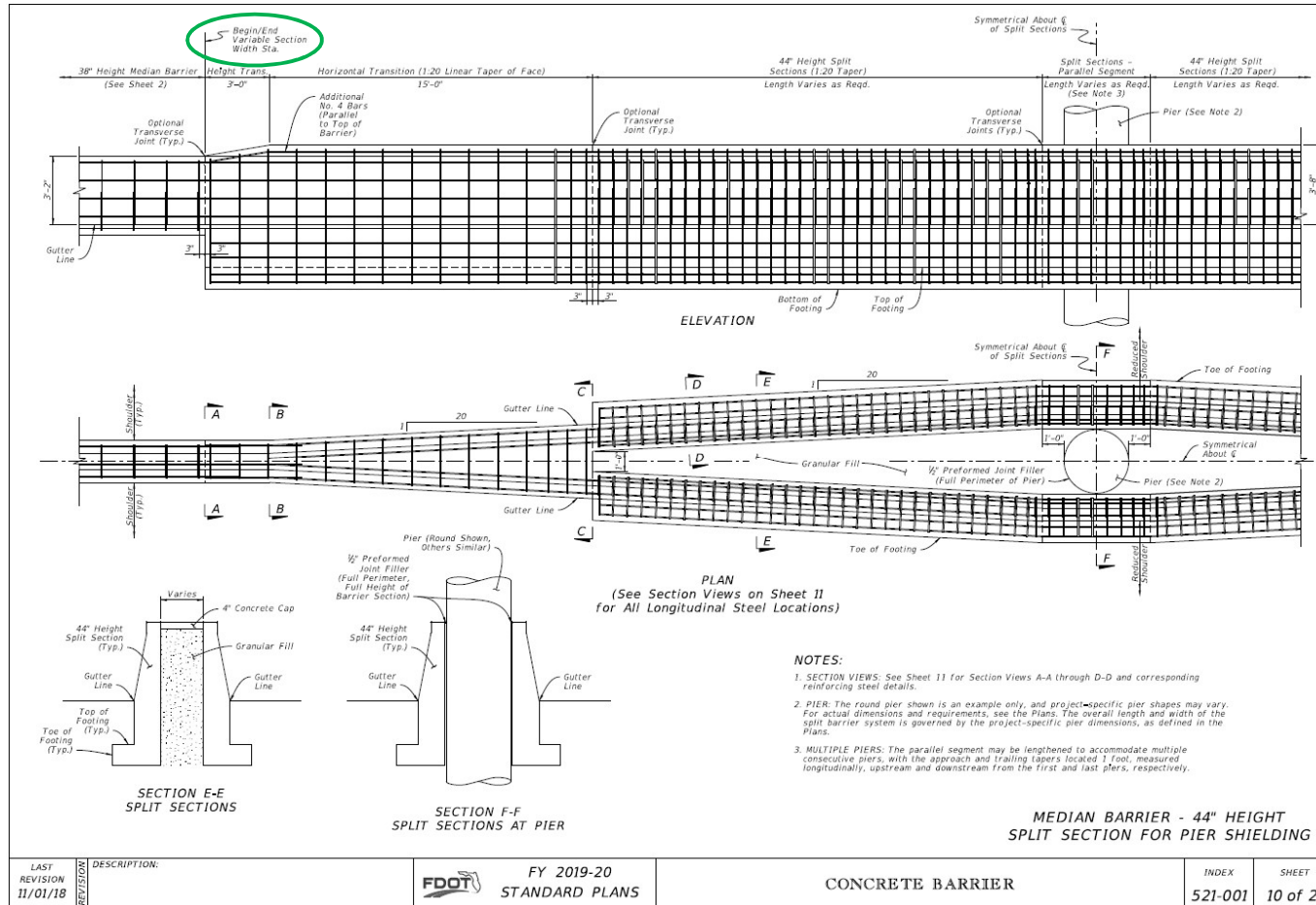
**NOTES:**

1. OVERHEAD SIGN SUPPORT: The overhead sign support shown is an example only; see the Plans for the project-specific dimensions and requirements. The overall length and width of the barrier's taper and parallel segments is governed by the overhead sign support dimensions as defined in the Plans.
2. MULTIPLE SIGN SUPPORTS: The parallel segment may be lengthened to accommodate multiple sign supports, with the approach and trailing tapers located 1 foot, measured longitudinally, upstream and downstream from the first and last sign support bases, respectively.
3. PLAN VIEW: Only outermost longitudinal reinforcing is shown for clarity. For all longitudinal reinforcing locations, see the Section Views.
4. STIRRUP BARS: For the vertical and transverse reinforcement requirements shown in Sections A-A, bar bending diagrams are not provided due to varying section dimensions. Use any combination of spliced reinforcing steel to position the reinforcement with the same cover, spacing, continuity, and equivalent strength shown herein, as approved by the Engineer.
5. CONCRETE OR FLOWABLE FILL: Use Class NS Concrete in accordance with Specification 347 or Non-Excavatable Flowable Fill in accordance with Specification 121.

MEDIAN BARRIER - 38" HEIGHT SPLIT SECTION FOR STAND-ALONE SIGN SUPPORT SHIELDING

|                           |              |                                      |                  |                  |                  |
|---------------------------|--------------|--------------------------------------|------------------|------------------|------------------|
| LAST REVISION<br>11/01/18 | DESCRIPTION: | FDOT<br>FY 2019-20<br>STANDARD PLANS | CONCRETE BARRIER | INDEX<br>521-001 | SHEET<br>9 of 26 |
|---------------------------|--------------|--------------------------------------|------------------|------------------|------------------|

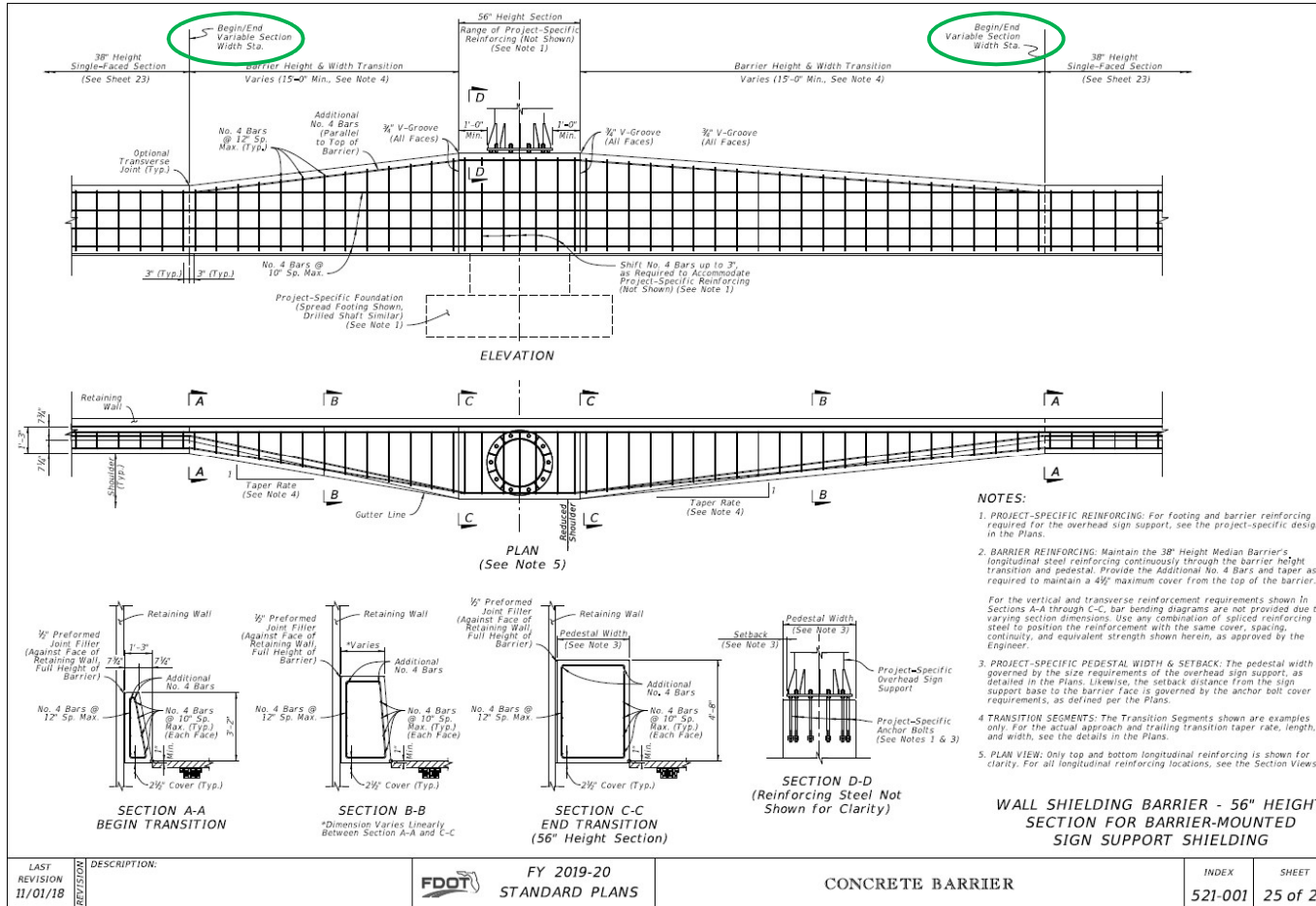
## Sheet 10: Variable Section Width Callouts



- Example of... Variable Section Width Pay Item (Double-Faced)

**NOTE:** Measurement is along centerline of entire Variable Section Width system per the SPI and Specifications.

## Sheet 25: Variable Section Width Callouts



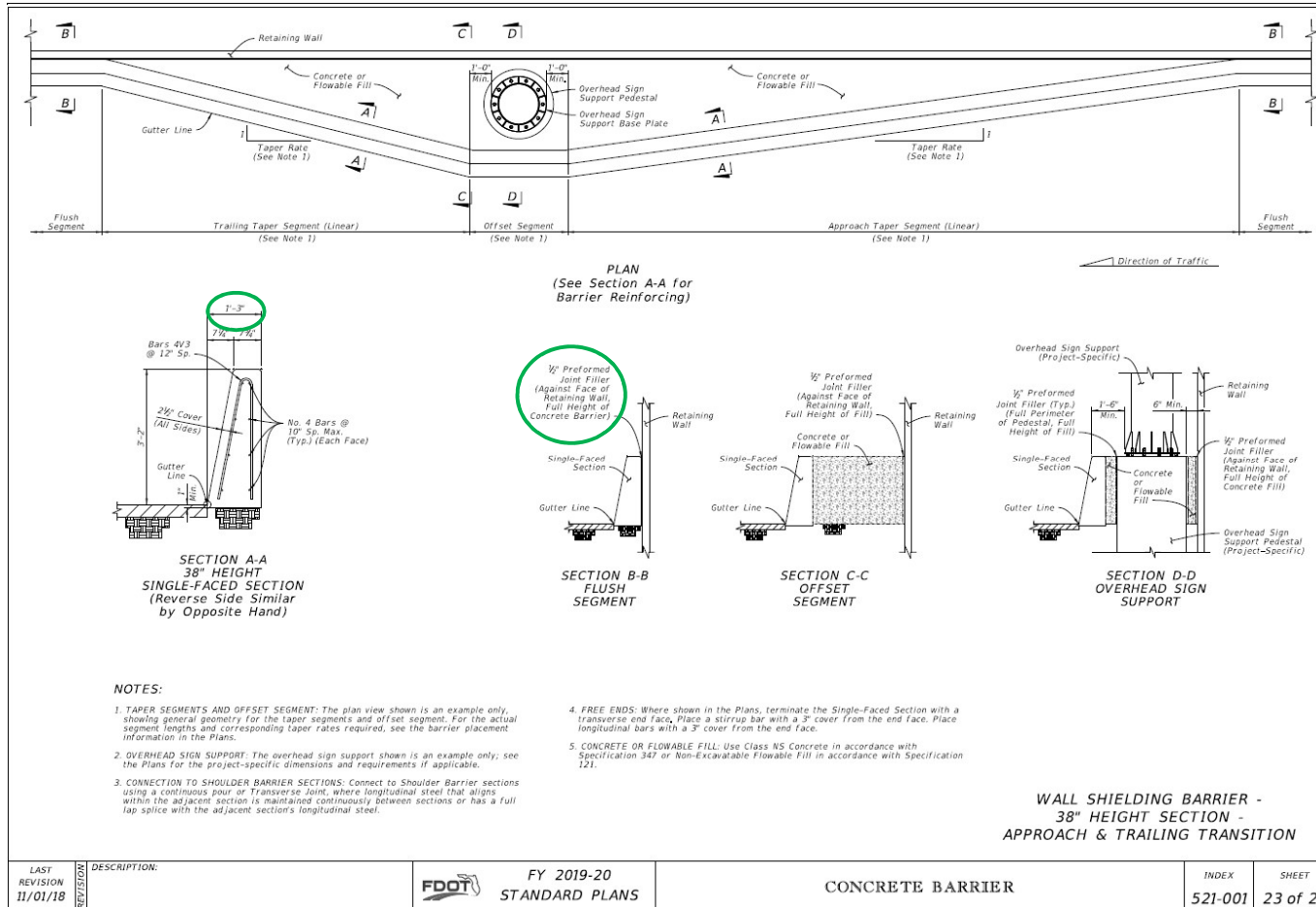
- Example of... Variable Section Width Pay Item (Single-Faced)
- Sneak Peak of *Wall Shielding Barrier*

## Wall Shielding Barrier – Past Examples (Non-Standard)





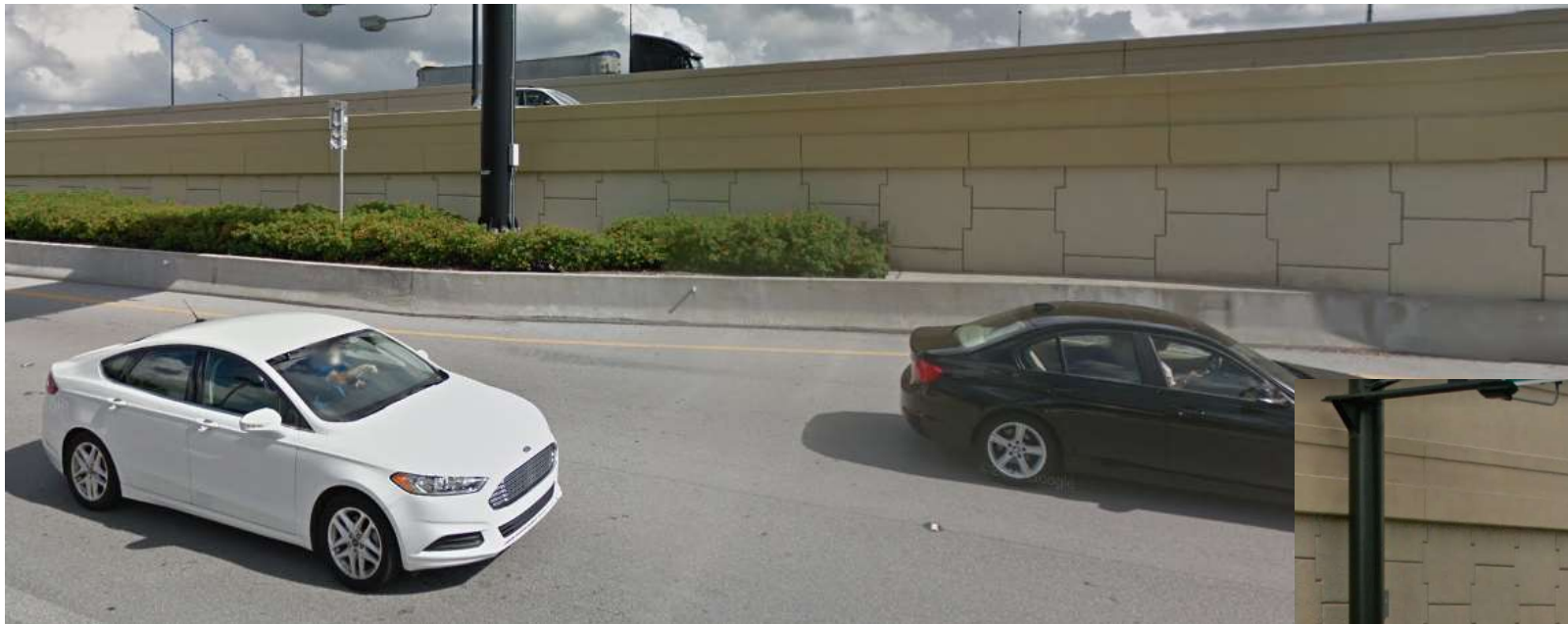
## Sheet 23: Wall Shielding Barrier – Approach & Trailing Taper



- Usage:** Decision is project-specific per the SPI, Part B (District-level decision)

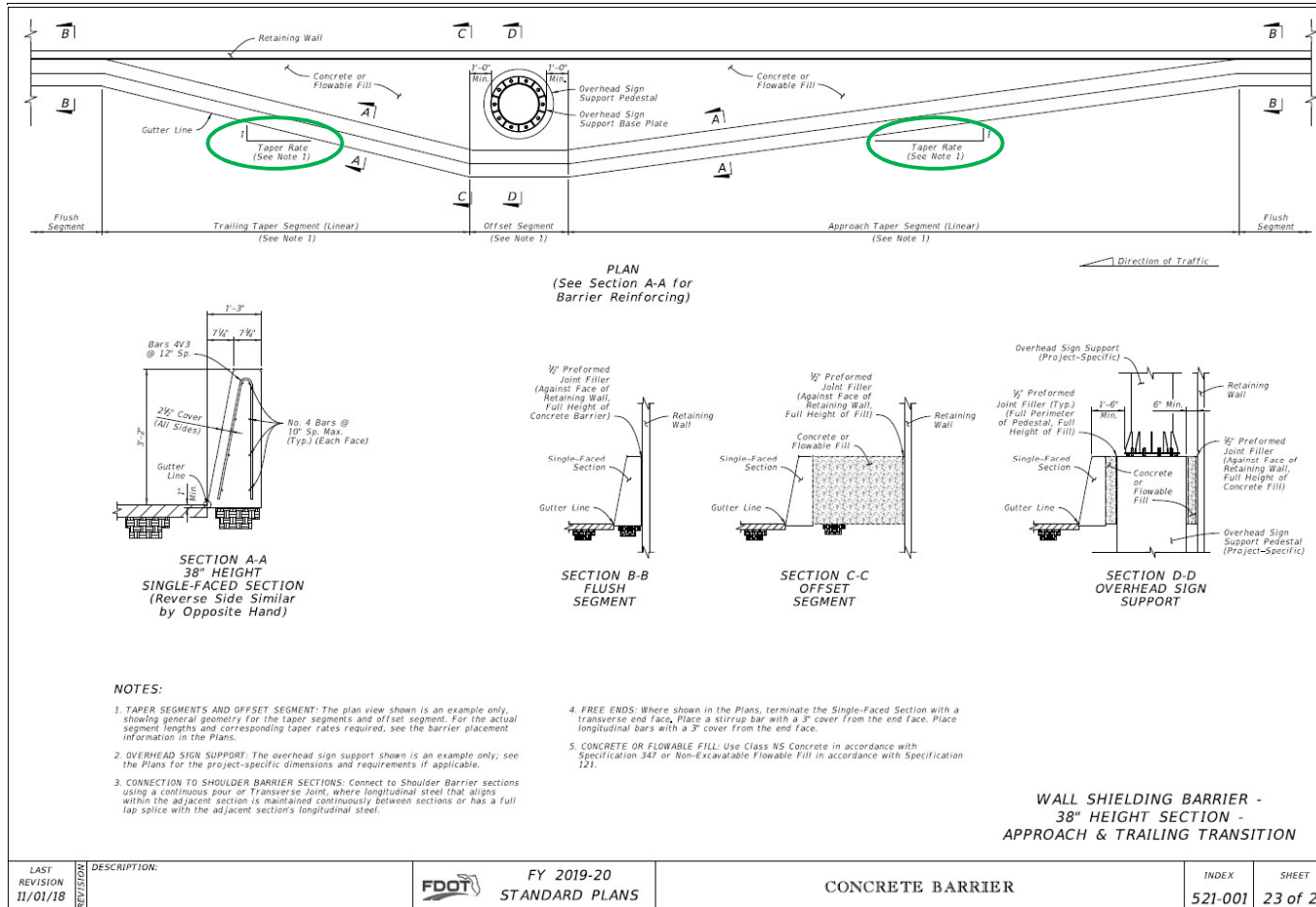
- Space Needed:** Requires 1'-3½" from retaining wall to gutter line (Barrier Section plus half-inch joint filler)

## Wall Shielding Barrier – Past Examples (Non-Standard) Approach and Trailing Taper (For Overhead Sign Support)





## Sheet 23: Wall Shielding Barrier – Approach & Trailing Taper

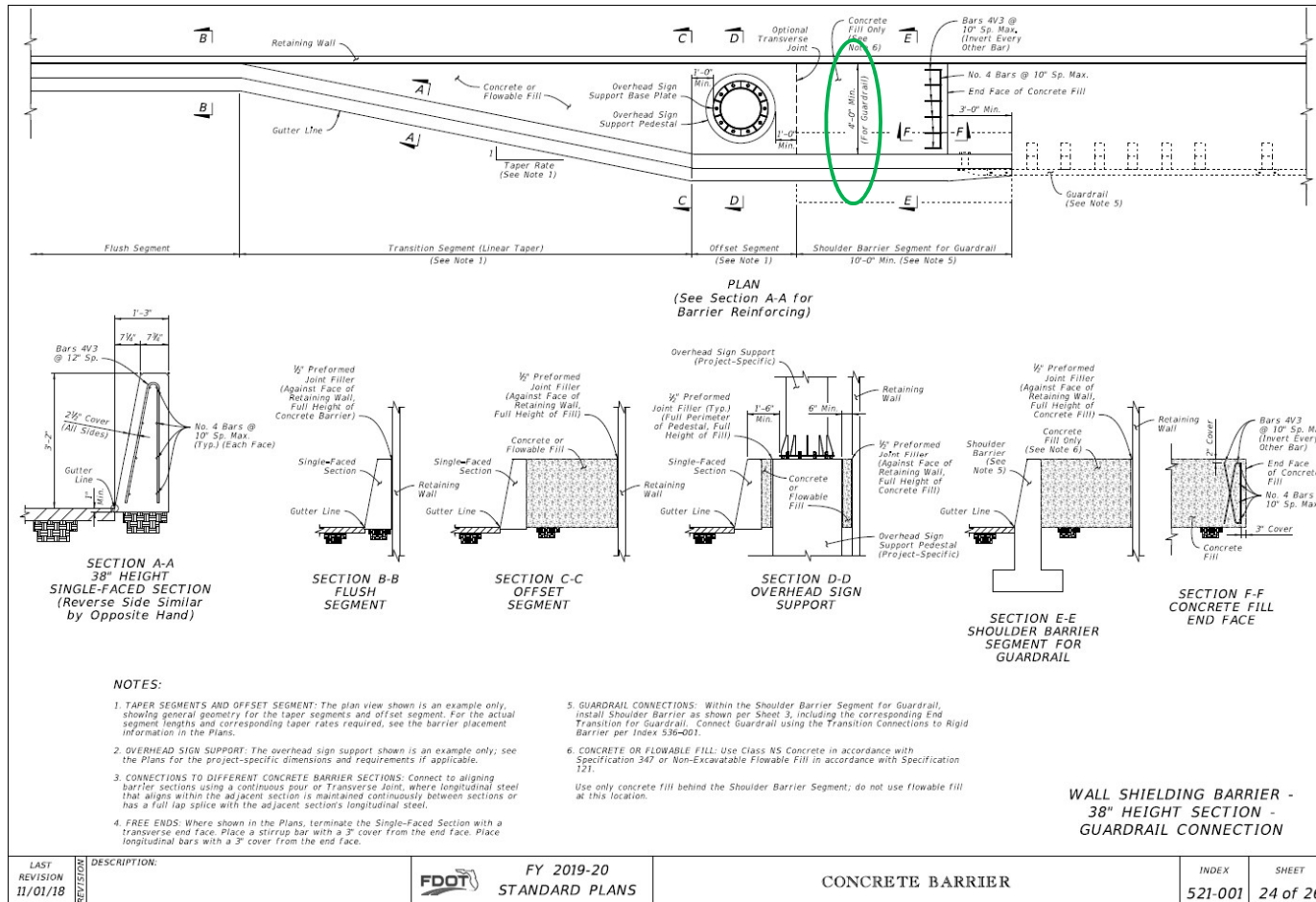


- **Tapers:** Requires project-specific approach and trailing taper rates based on Design Speed (upcoming slides)
- **Overhead Sign Support:** Project-specific Design, similar to Median Version, (Sheets 9-10)

## Wall Shielding Barrier – Past Examples (Non-Standard) Guardrail Connection

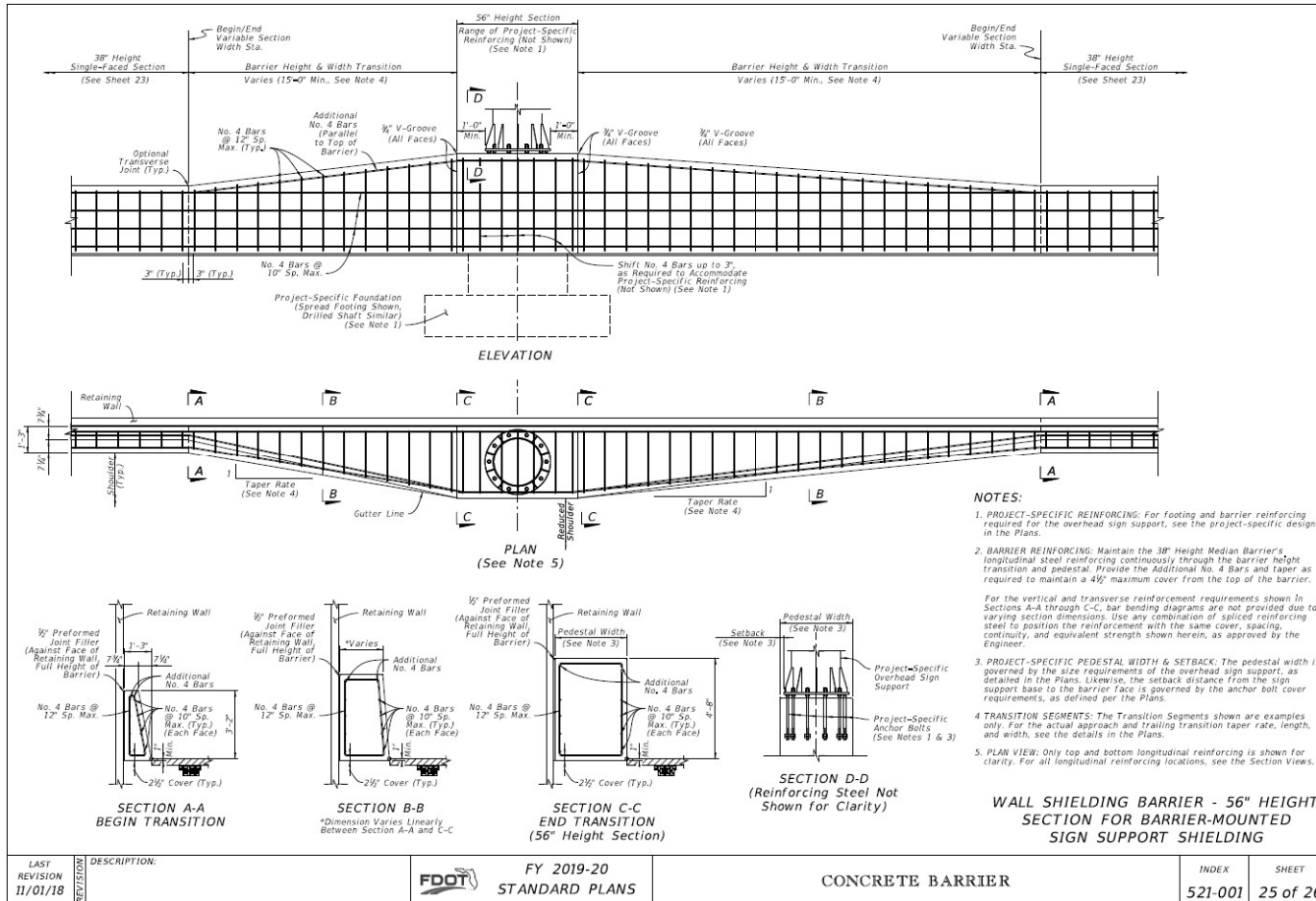


## Sheet 24: Wall Shielding Barrier – Guardrail Connection



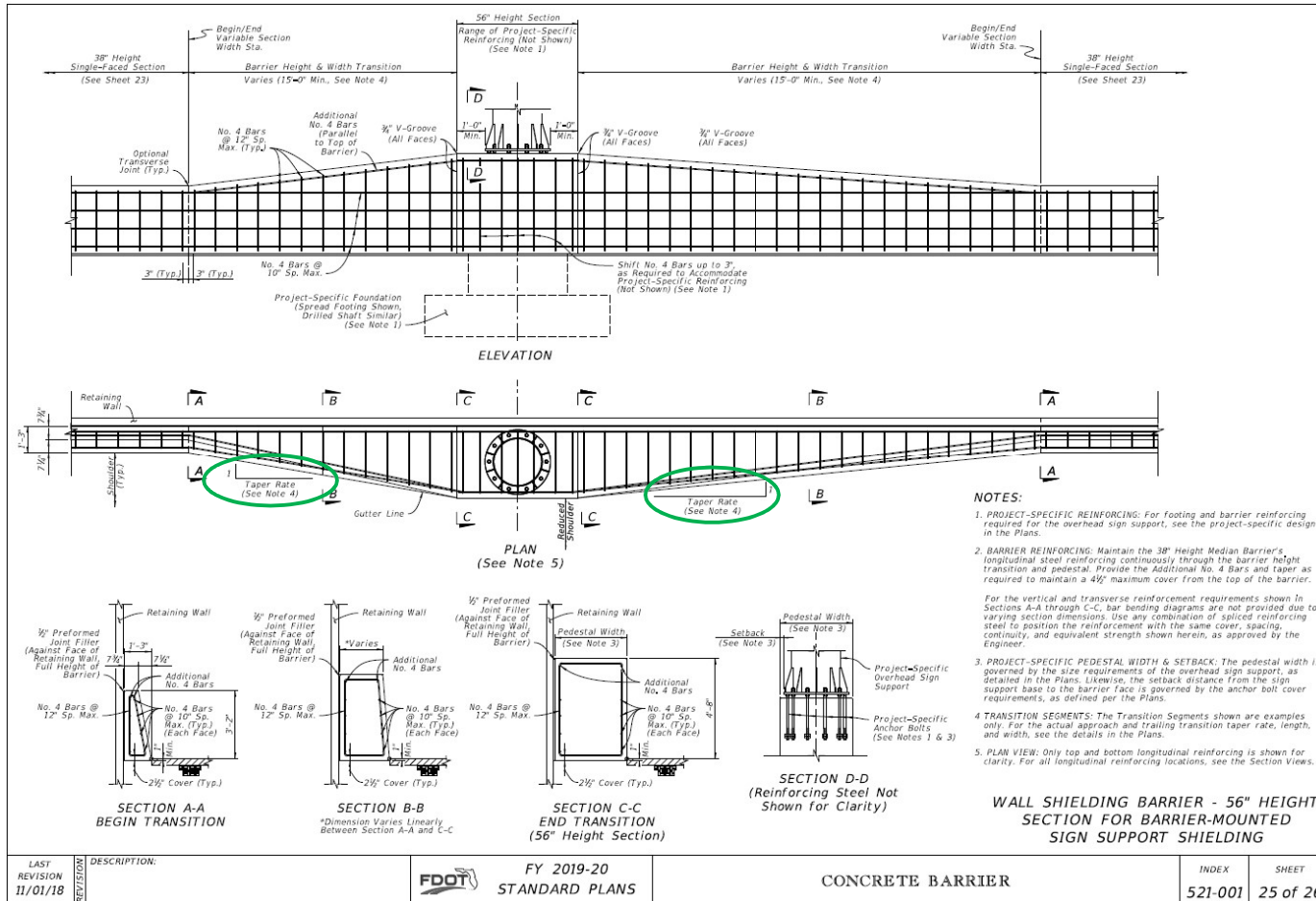
- **Space Needed:** Requires 5'-3½" from retaining wall to gutter line (for proper Guardrail setback)
- **Overhead Sign Support:** Project-specific design, similar to median version, (Sheets 9-10)

## Sheet 25: Wall Shielding Barrier – Barrier-mounted Sign Support



- **Space Needed:** Requires minimal space for a sign support that is governed by project-specific width of Overhead Sign Support
- **Overhead Sign Support:** Project-specific design, similar to median version, (Sheets 6-8)

## Sheet 25: Wall Shielding Barrier – Barrier-mounted Sign Support



- Tapers: Requires project-specific approach and trailing taper rates based on Design Speed (upcoming slides)



## SPI: *New General Barrier Taper Rates*

### G. Barrier Taper Rates:

Where conditions require the face of barrier to deviate from running parallel to the roadway, the shift in lateral offset must not exceed the taper rates provided below.

**Table 2: Maximum Barrier Taper Rates**

| Barrier Type:   | Design Speed (mph): | Approach End *Maximum Taper Rate: | Trailing End *Maximum Taper Rate |
|---|---------------------|-----------------------------------|----------------------------------|
| Median Barrier  | All                 | 1:20                              | 1:20                             |
|   | 70                  | 1:20                              | 1:5                              |
| Shoulder Barrier,<br>Curb & Gutter Barrier,<br>and Wall Shielding Barrier | 60                  | 1:18                              | 1:5                              |
|   | 55                  | 1:16                              | 1:5                              |
|   | 50                  | 1:14                              | 1:5                              |
|   | 45                  | 1:12                              | 1:5                              |
|   | 40                  | 1:10                              | 1:5                              |
|   | 30                  | 1:8                               | 1:5                              |

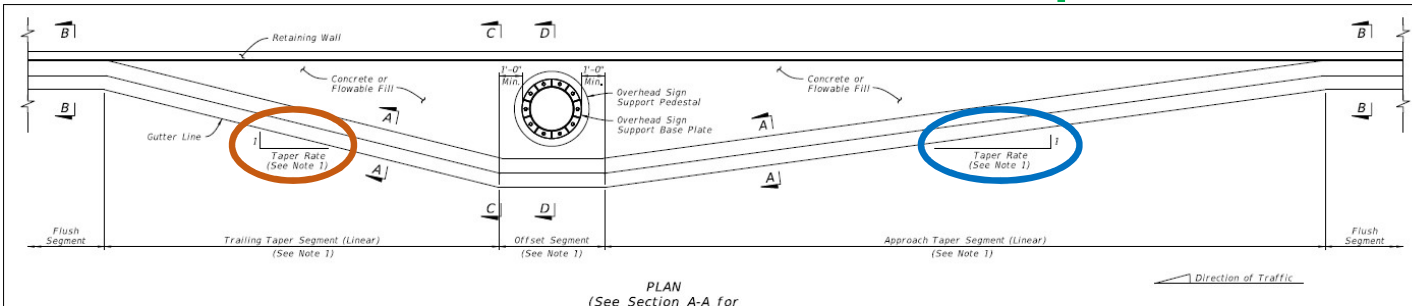
\*Taper Rate is measured relative to the roadway centerline (lateral offset : length)

- **Median Barrier:** (double faced) is a consistent 1:20
- **Shoulder Barrier** (single-faced) varies by Design Speed and approach direction to assist with minimizing space requirements

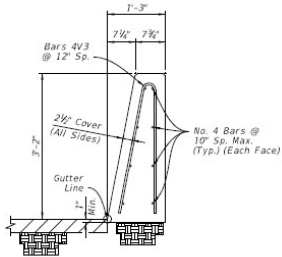


## SPI: **New General Barrier Taper Rates**

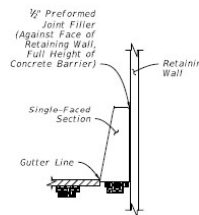
- Taper Example – Wall Shielding Barrier**



PLAN  
(See Section A-A for  
Barrier Reinforcing)



SECTION A-A  
38" HEIGHT  
SINGLE-FACED SECTION  
(Reverse Side Similar  
by Opposite Hand)



SECTION B-B  
FLUSH  
SEGMENT

**NOTES:**

- TAPER SEGMENTS AND OFFSET SEGMENT:** The plan view shown is an example only, showing general geometry for the taper segments and offset segment. For the actual segment lengths and corresponding taper rates required, see the barrier placement information in the Plans.
- OVERHEAD SIGN SUPPORT:** The overhead sign support shown is an example only; see the Plans for the project-specific dimensions and requirements if applicable.
- CONNECTION TO SHOULDER BARRIER SECTIONS:** Connect to Shoulder Barrier sections using a continuous pair of Transverse Joint, where longitudinal steel that aligns within the adjacent section is maintained continuously between sections or has a full lap splice with the adjacent section's longitudinal steel.

- FREE ENDS:** Where shown in transverse end face, place longitudinal bars with a 3" c.
- CONCRETE OR FLOWABLE FI:** Specification 347 or Non-Ex. 121.




**Table 2: Maximum Barrier Taper Rates**

| Barrier Type:   | Design Speed (mph): | Approach End<br>*Maximum Taper Rate: | Trailing End<br>*Maximum Taper Rate |
|---|---------------------|--------------------------------------|-------------------------------------|
| Median Barrier  | All                 | 1:20                                 | 1:20                                |
|   | 70                  | 1:20                                 | 1:5                                 |
| Shoulder Barrier,<br>Curb & Gutter Barrier,<br>and Wall Shielding Barrier | 60                  | 1:18                                 | 1:5                                 |
|   | 55                  | 1:16                                 | 1:5                                 |
|   | 50                  | 1:14                                 | 1:5                                 |
|   | 45                  | 1:12                                 | 1:5                                 |
|   | 40                  | 1:10                                 | 1:5                                 |
|   | 30                  | 1:8                                  | 1:5                                 |

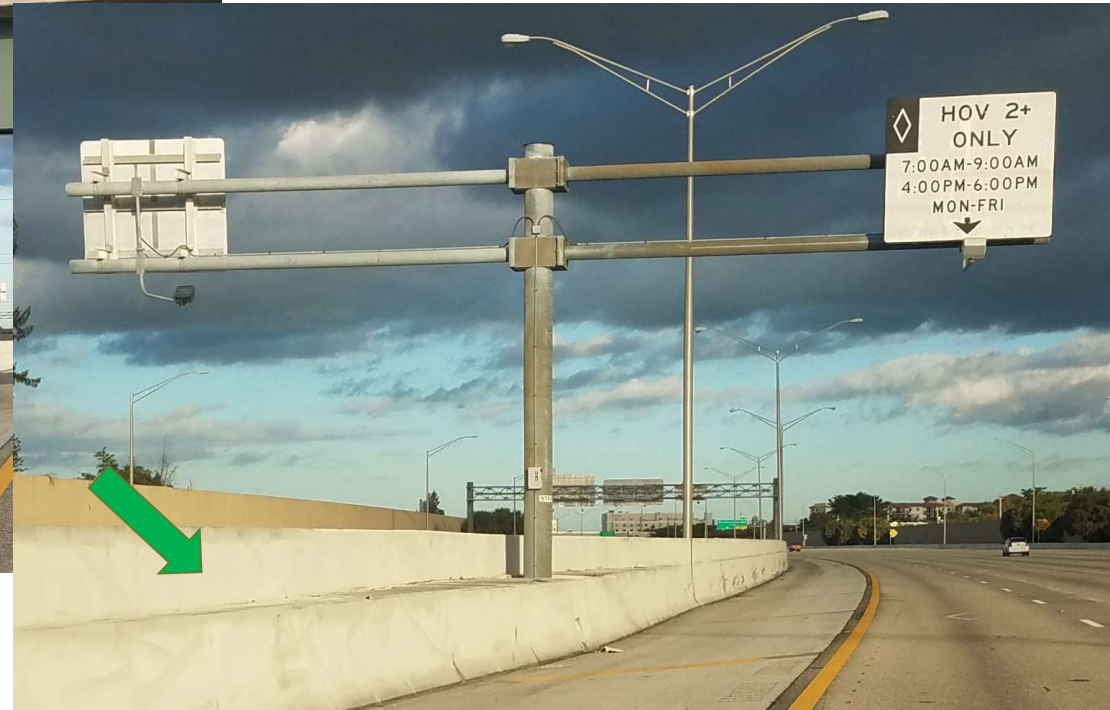
WALL SHIELDING BARRIER -  
38" HEIGHT SECTION -  
APPROACH & TRAILING TRANSITION

|                           |              |                              |                  |                  |                   |
|---------------------------|--------------|------------------------------|------------------|------------------|-------------------|
| LAST REVISION<br>11/01/18 | DESCRIPTION: | FY 2019-20<br>STANDARD PLANS | CONCRETE BARRIER | INDEX<br>521-001 | SHEET<br>23 of 26 |
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**3) Index 521-010 – Opaque Visual Barrier (OVB)**
  - *Redeveloped* Index Sheets for Clarity
    - Durability Improvements
    - Varying Barrier Heights
  - *New* SPI and FDM Section

## Opaque Visual Barrier – Past Examples (Previous-Standard)



**FDM:**      **New FDOT Design Manual Section****215.5.1.2      Opaque Visual Barrier**

Opaque Visual Barrier is used on top of median concrete barrier and traffic railing to reduce headlight glare from opposing traffic lanes. Opaque Visual Barrier may be considered on LA Facilities that have glare issues when the facility has high-traffic volumes and a separation between opposing traffic lanes of 26 feet or less.

When Opaque Visual Barrier is used, a minimum shoulder width of 4 feet is required on both sides of the median concrete barrier or traffic railing.

[Standard Plans](#), *Index 521-010* and the associated *Standard Plans Instructions* provide additional information.

- **Usage Considerations:**
  - Remains a project-specific, District level decision
  - Guideline for LA Facilities... (see highlighted)
- **Usage Limitations:**
  - Median Barrier use only with min. 4 feet shoulder either side (Further explanation in SPI)



## SPI: **New Standard Plans Instructions**

Standard Plans Instructions  
Index 521-010 Opaque Visual Barrier

Topic No. 625-010-003  
FY 2019-20

### Index 521-010 Opaque Visual Barrier (OVB)

#### Design Criteria

FDOT Design Manual (*FDM*); AASHTO Roadside Design Guide, 4th Edition; NCHRP Synthesis of Highway Practice 66

#### Design Assumptions and Limitations

For usage information, see [FDM 215](#).

OVB is only intended for use as a visual screen; it is designed to withstand wind loading, light debris, and minor contact from errant vehicles.

OVB is not intended to resist or shield against errant vehicle impact loads; it is designed to yield upon large vehicle strikes.

#### A. Placement:

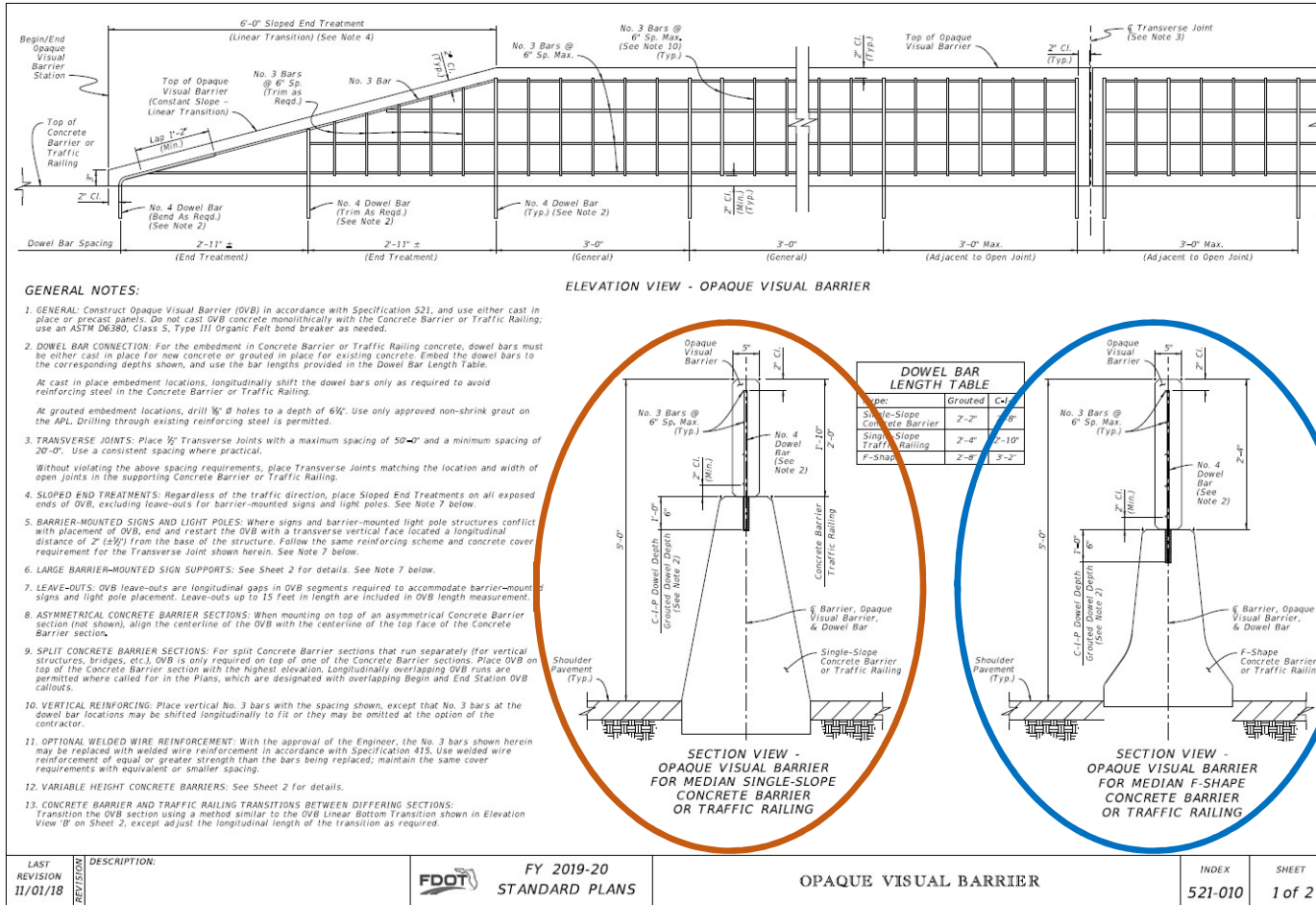
Per **Index 521-010**, align the centerline of the OVB with the centerline of the top face of the supporting Concrete Barrier or Traffic Railing. ....

### Covers:

- Crash-worthiness design limitations
- General placement practices
- Callout locations (corresponds to Index drawing's Begin/End OVB Sta.)
- Pay Item information



## Sheet 1: Redeveloped OVB – New Heights and Features



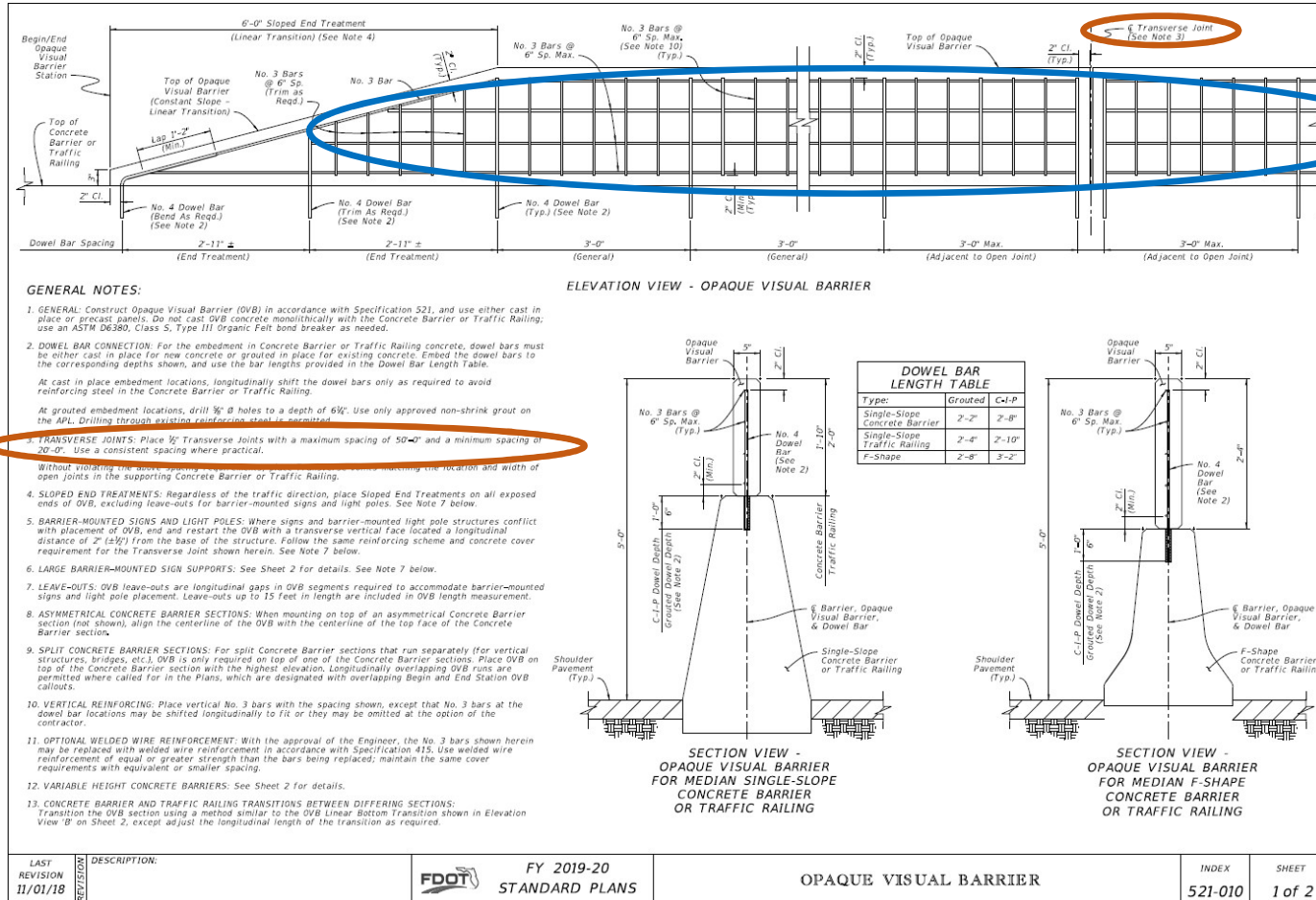
- Notes rewritten for clarity with new headings

- New OVB Heights: Now accommodates multiple cases:

- New Single-Slope Concrete Barrier & Bridge Traffic Railing
- Old F-Shape Barrier (Existing)

|               |              |      |                              |                       |         |        |
|---------------|--------------|------|------------------------------|-----------------------|---------|--------|
| LAST REVISION | DESCRIPTION: | FDOT | FY 2019-20<br>STANDARD PLANS | OPAQUE VISUAL BARRIER | INDEX   | SHEET  |
| 11/01/18      |              |      |                              |                       | 521-010 | 1 of 2 |

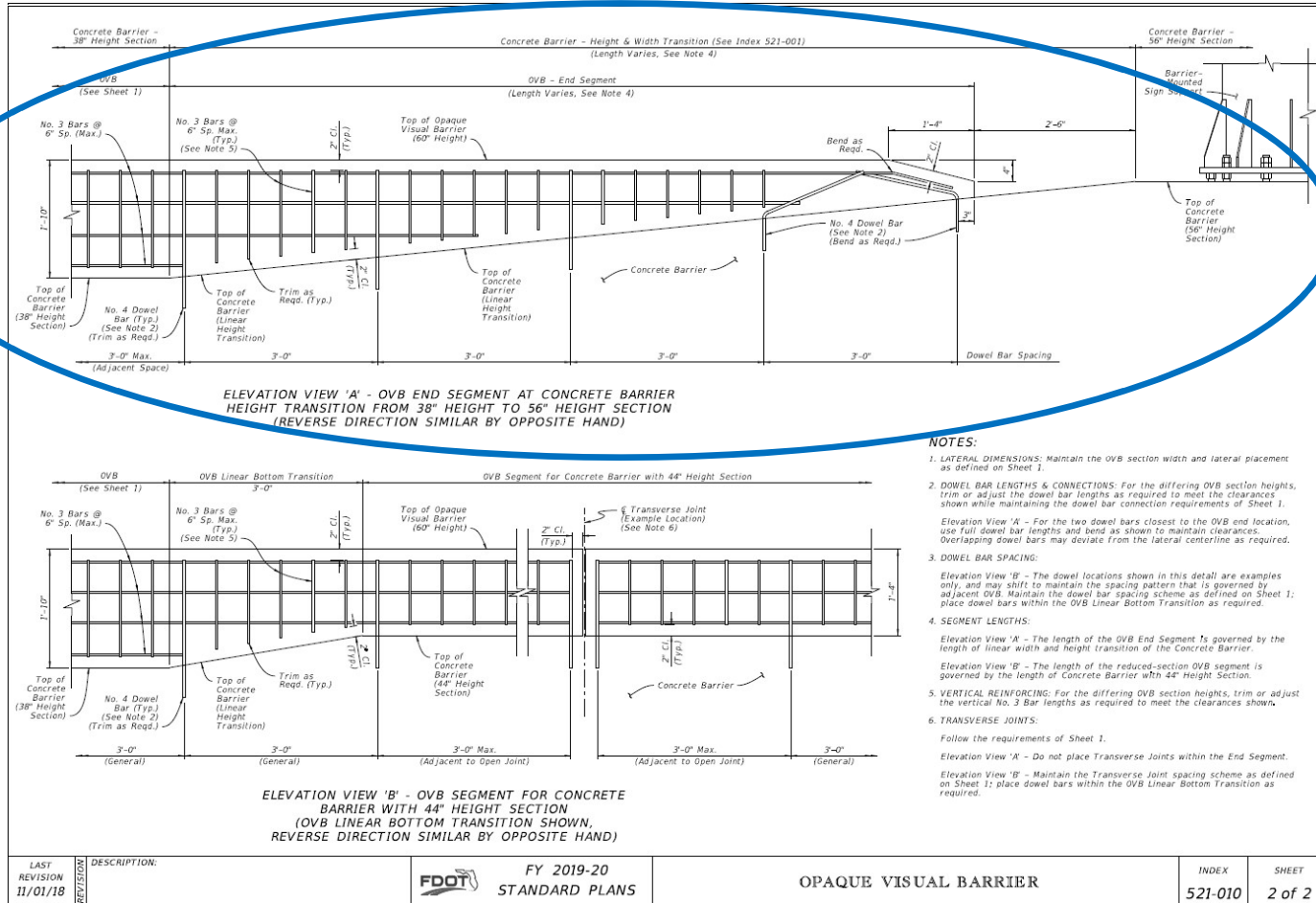
## Sheet 1: Redeveloped OVB – New Heights and Features



- Tighter Reinforcing:** web now 6" spacing

- Longer Panel Lengths:** minimum joint spacing of 20 feet

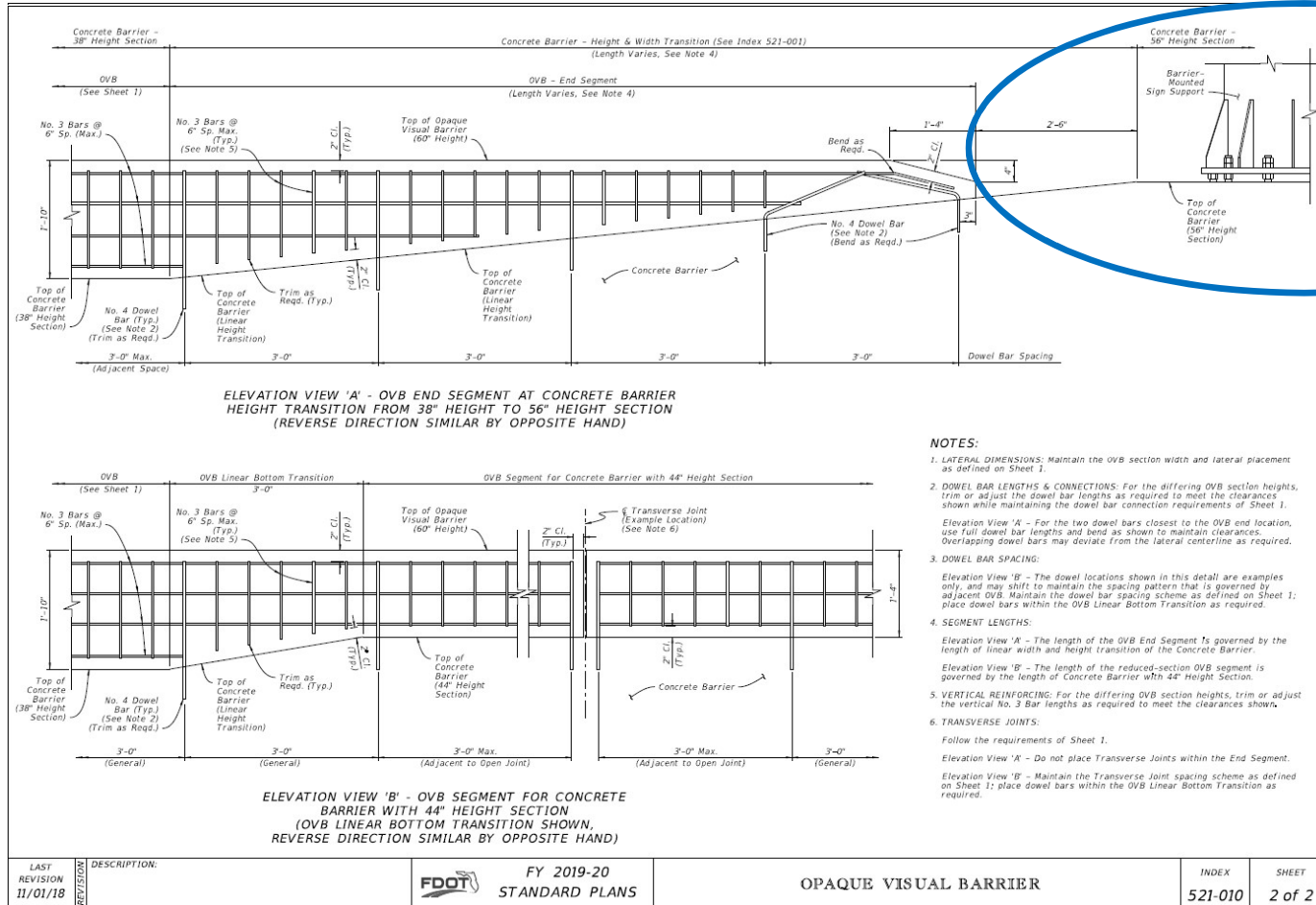
## Sheet 2: **New Sheet – “Leave-Out” & Variable Height Details**



- Large Sign Support with 56" Height Barrier (per Index 521-001)

| LAST REVISION | DESCRIPTION: | FY 2019-20     | INDEX   | SHEET  |
|---------------|--------------|----------------|---------|--------|
| 11/01/18      |              | STANDARD PLANS | 521-010 | 2 of 2 |

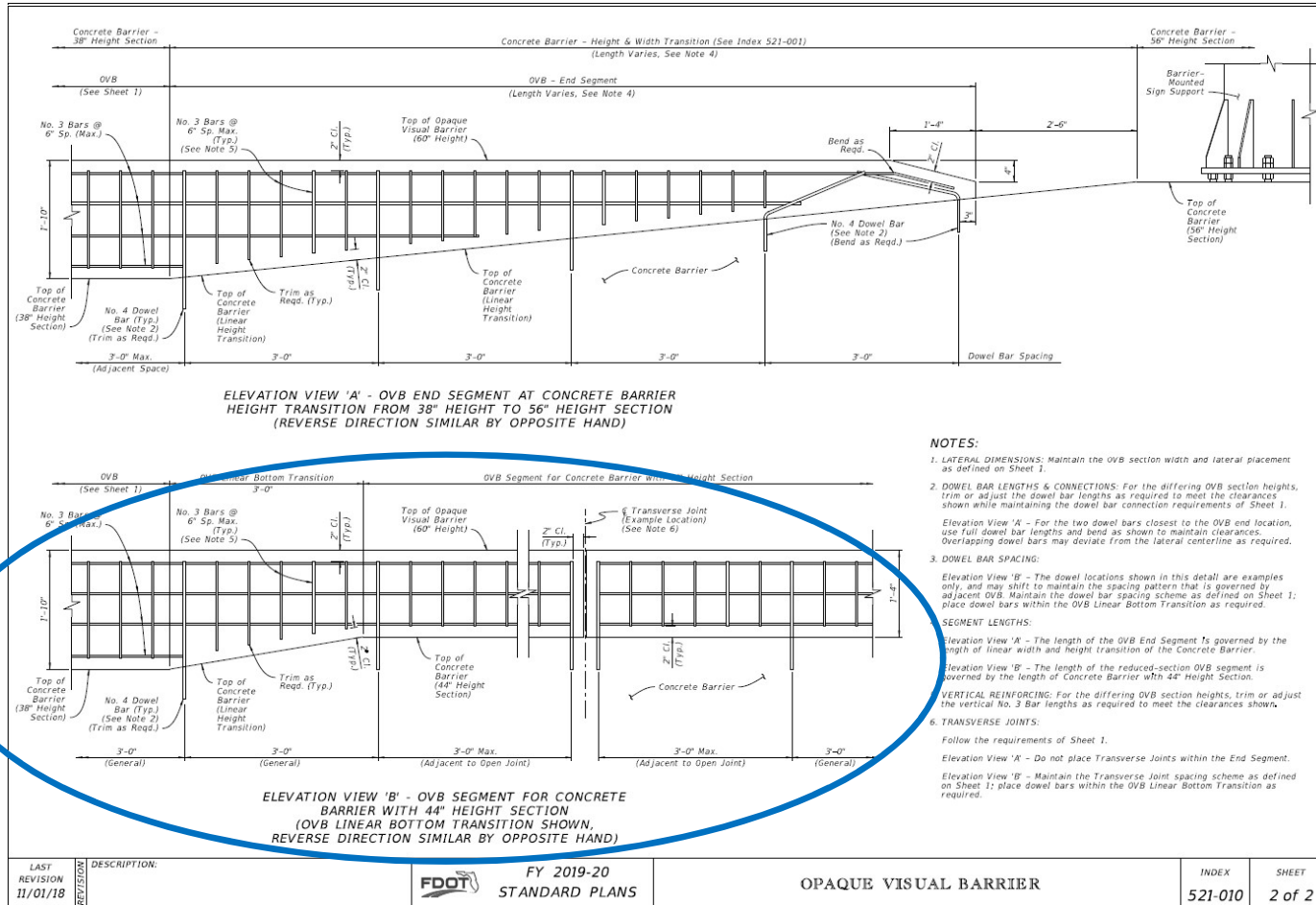
## Sheet 2: **New Sheet – “Leave-Out” & Variable Height Details**



- **“Leave-Out” Example:** Per General Note 7, “Leave-Outs” of up to 15 feet are permitted with one continuous Pay Item measurement (to accommodate barrier-mounted signs and light poles)



## Sheet 2: **New Sheet – “Leave-Out” & Variable Height Details**



- **Variable Heights:** Detail for OVB Panels over raised barrier height sections (Uses same Pay Item)

- Example here shows 44" Height Barrier with height transition (other heights and transitions similar)

| LAST REVISION | DESCRIPTION: | FY 2019-20     | INDEX   | SHEET  |
|---------------|--------------|----------------|---------|--------|
| 11/01/18      |              | STANDARD PLANS | 521-010 | 2 of 2 |



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*544-001 is for "Permanent Crash Cushions" on the APL...*



## Sheet 1: *Redeveloped – Updated Design Process*

**GENERAL NOTES:**

1. GENERAL: Work this Index in accordance with Specification 544 and the "Summary of Permanent Crash Cushions" table in the Plans.
2. TRANSITION PANEL: Where crash cushions are placed between two-way traffic or adjacent to two-way two-lane traffic, place a Transition Panel from the Concrete Barrier to the Crash Cushion on the downstream side of the barrier end (as shown). Follow the requirements of the APL drawing.
3. MANUFACTURER'S TRANSITION: Construct the proprietary guardrail transition only if shown in the applicable APL drawing. See Note 4 below.
4. STANDARD GUARDRAIL TRANSITION: If the APL drawing does not provide a guardrail transition to w-beam guardrail, construct the Standard Guardrail Transition segment from three-beam to w-beam as shown per Sheet 2. This 21'-10 1/2" segment must remain parallel to the roadway.  
  
If the APL drawing does provide a guardrail transition to w-beam guardrail, replace the Standard Guardrail Transition segment with a w-beam guardrail segment at 6'-3" post spacing, except that Post (10) will remain where shown herein if it is located at a guardrail begin or end taper station callout per the Plans. This 21'-10 1/2" segment must also remain parallel to the roadway.
5. LENGTH OF END TREATMENT: For Crash Cushions, the Length of End Treatment includes all proprietary elements of the design as shown in the APL drawing, including the manufacturer's transition of guardrail if applicable.  
  
The actual Length of End Treatment varies per Crash Cushion type, but an estimated Length of End Treatment is generally shown in the Plans to provide sufficient space for the Contractor's option of differing Crash Cushion types.
6. LENGTH RESTRICTION: In the "Summary of Permanent Crash Cushions" table, if a value is provided in the Length Restriction column, then select a Crash Cushion from the APL which has a Length of End Treatment less than or equal to the value shown. If the table instead shows not applicable (N/A), then Crash Cushion selection is unrestricted regarding length.
7. CRASH CUSHION STATION: The Crash Cushion Station point shown herein corresponds to the station provided in the "Summary of Permanent Crash Cushions" table in the Plans.

**CONCRETE BARRIER APPLICATION**

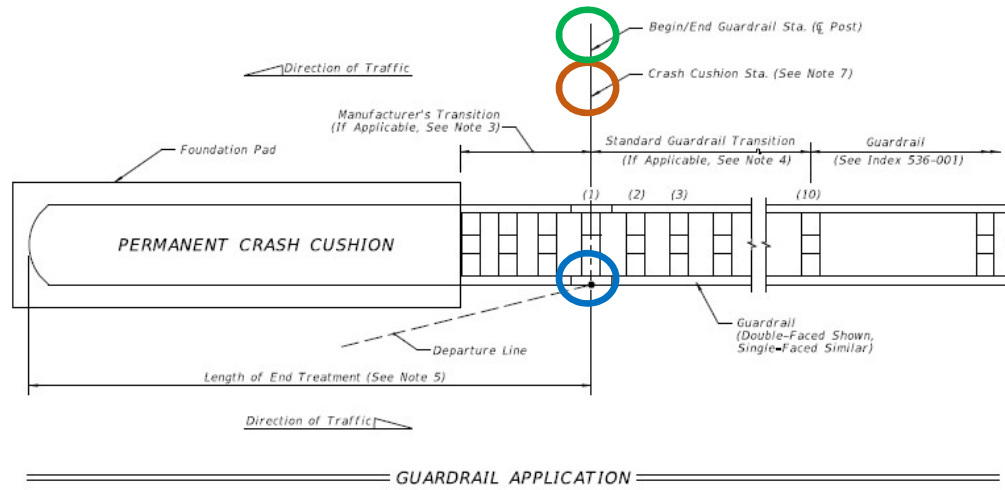
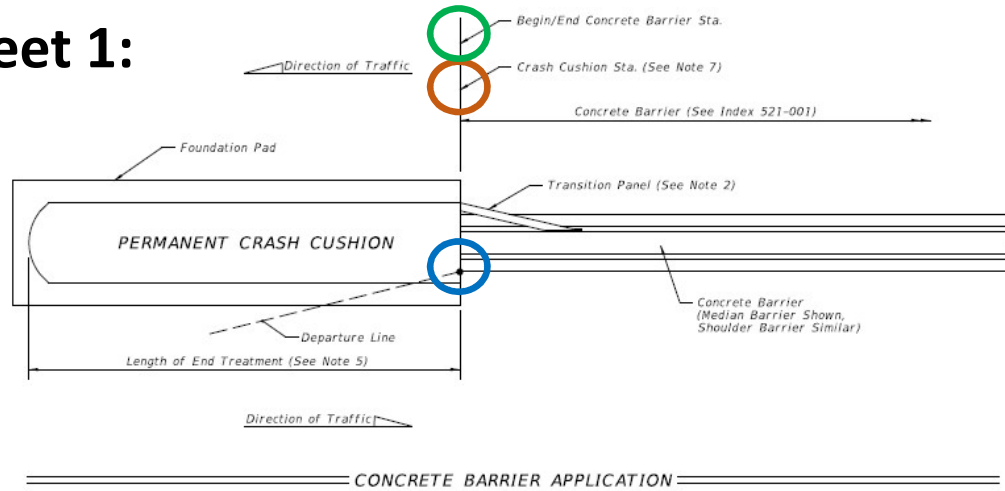
**GUARDRAIL APPLICATION**

**PERMANENT CRASH CUSHION APPLICATIONS**

- Drawings and Notes Redeveloped for Clarity
- “Length of Need” Process Simplified
- “Summary of Permanent Barrier Wall” Table Simplified
- Pay Item Updates

|                           |          |              |                              |                       |                  |                 |
|---------------------------|----------|--------------|------------------------------|-----------------------|------------------|-----------------|
| LAST REVISION<br>11/01/18 | REVISION | DESCRIPTION: | FY 2019-20<br>STANDARD PLANS | CRASH CUSHION DETAILS | INDEX<br>544-001 | SHEET<br>1 of 2 |
|---------------------------|----------|--------------|------------------------------|-----------------------|------------------|-----------------|

## Sheet 1:

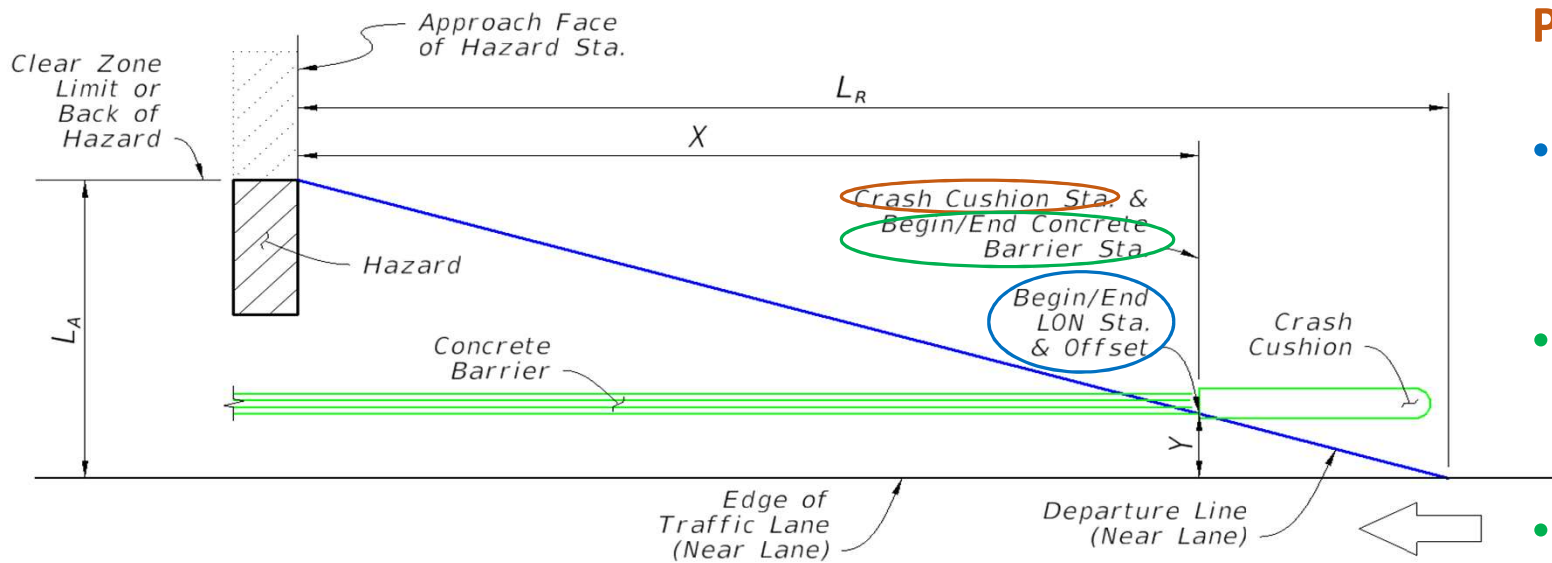


### First Concept:

Crash Cushion Callout Point is the same as the:

- 'Length of Need' Location
- Begin/End Guardrail Station or...
- Begin/End Concrete Barrier Station

## Concrete Barrier LON Design Tool (Excel):



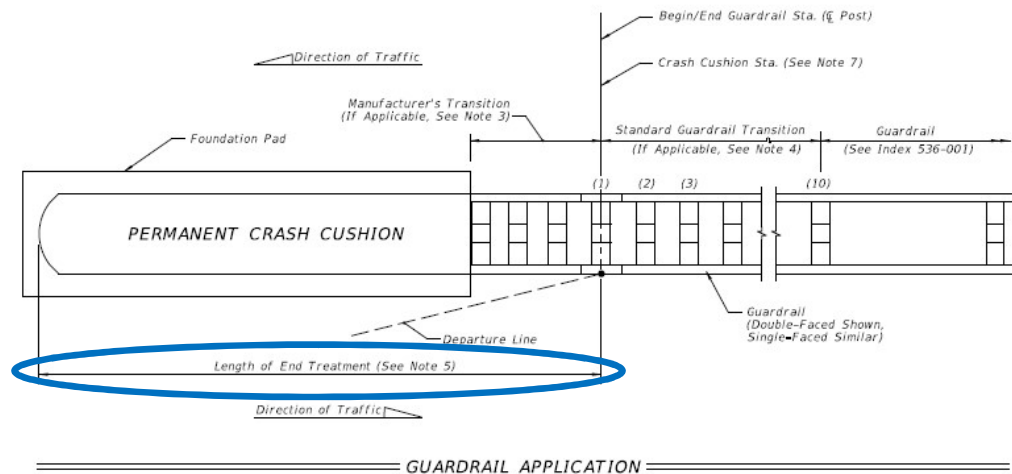
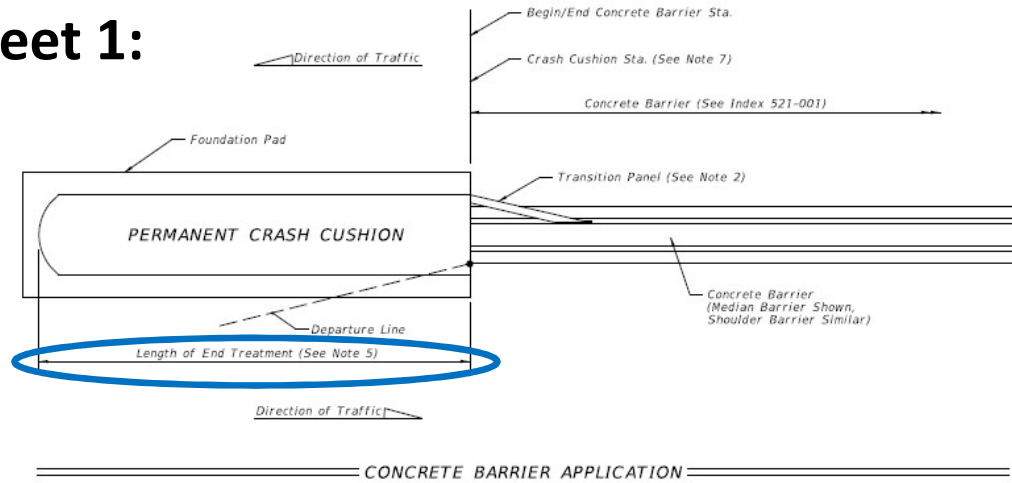
### First Concept:

Crash Cushion Callout Point is the same as the:

- 'Length of Need' Location
- Begin/End Guardrail Station or...
- Begin/End Concrete Barrier Station



## Sheet 1:

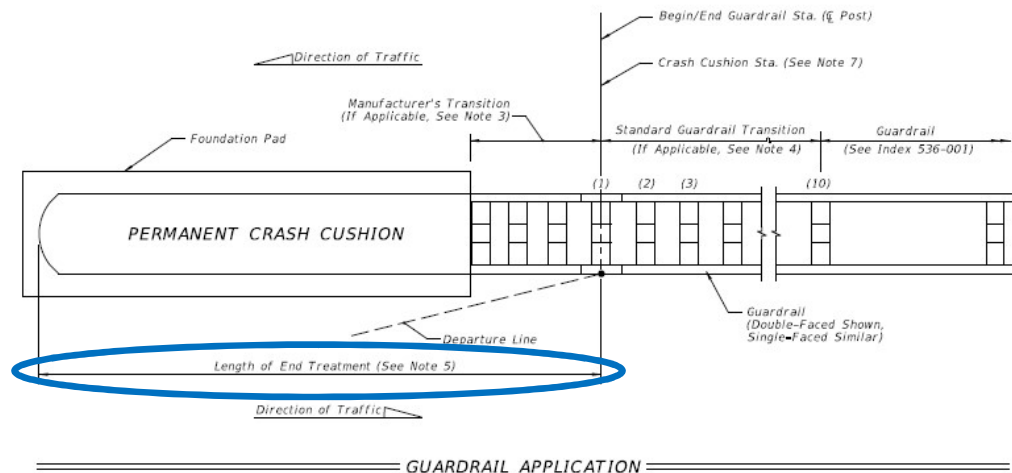
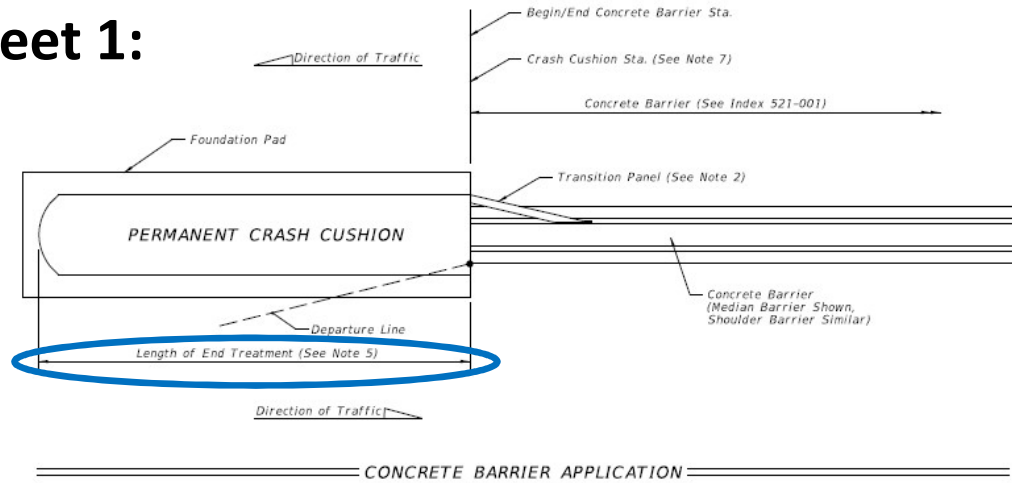


## Second Concept:

**‘Length of End Treatment’** – Segment upstream of the connecting Concrete Barrier or Guardrail...

- Includes all proprietary elements required per the APL drawings
- For Guardrail, this includes the *“Manufacturer’s Transition”*

## Sheet 1:



## Second Concept:

**‘Length of End Treatment’** – Segment upstream of the connecting Concrete Barrier or Guardrail...

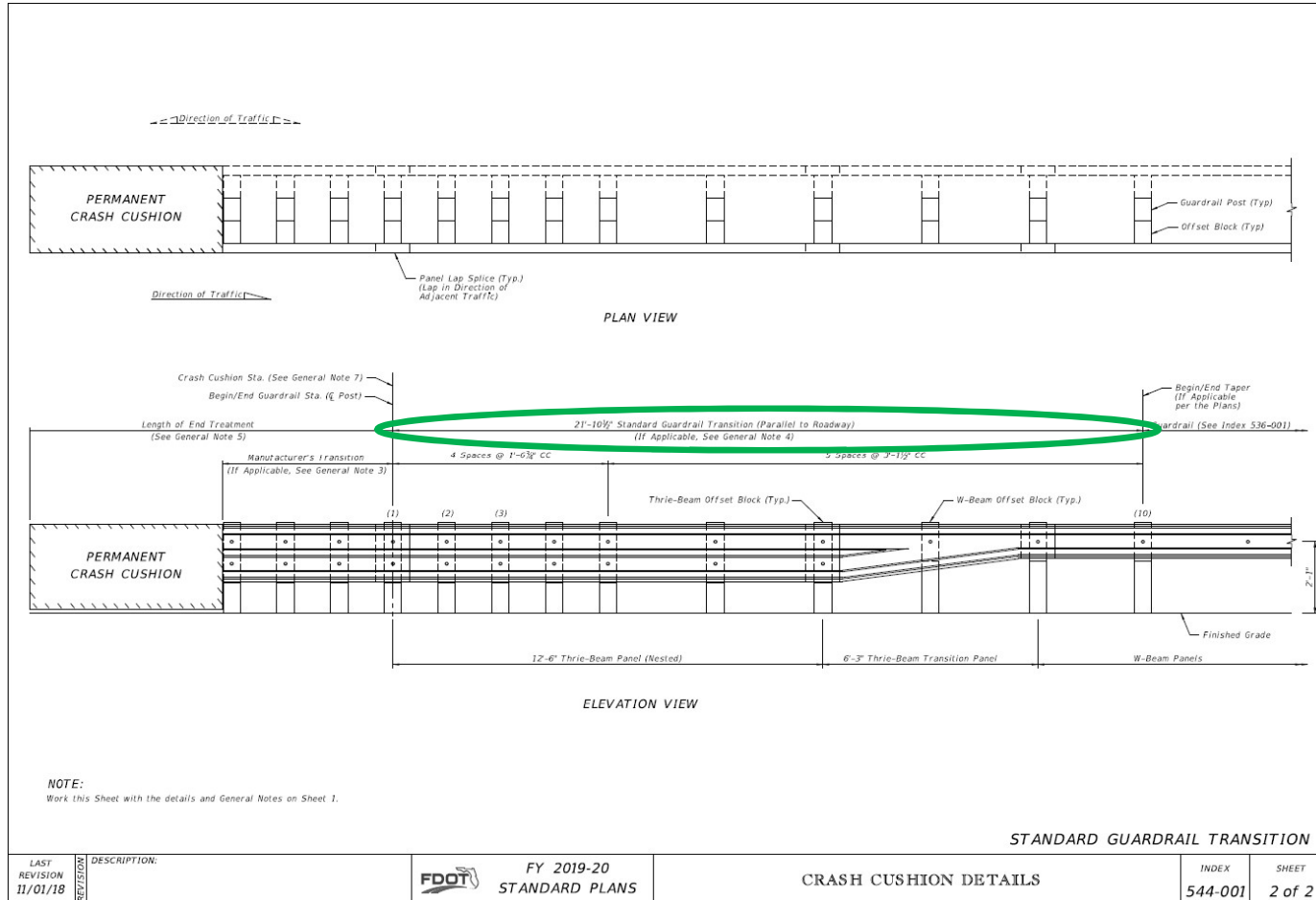
- Length varies by type and manufacturer
- **Default length** for designers is **27'-6"** (to accommodate contractor's choice)  
*See SPI Part D*

## Sheet 2: *Redeveloped* – Standard Guardrail Transition

### Third Concept:

### 'Standard Guardrail Transition'

- Always a required parallel segment that is 21'-10½" Long
- This post and panel configuration may change depending on Manufacturer's needs, but for Designer's planning, the segment is always parallel to roadway and 21'-10½".



**'LON' Design  
Tool (Excel):**

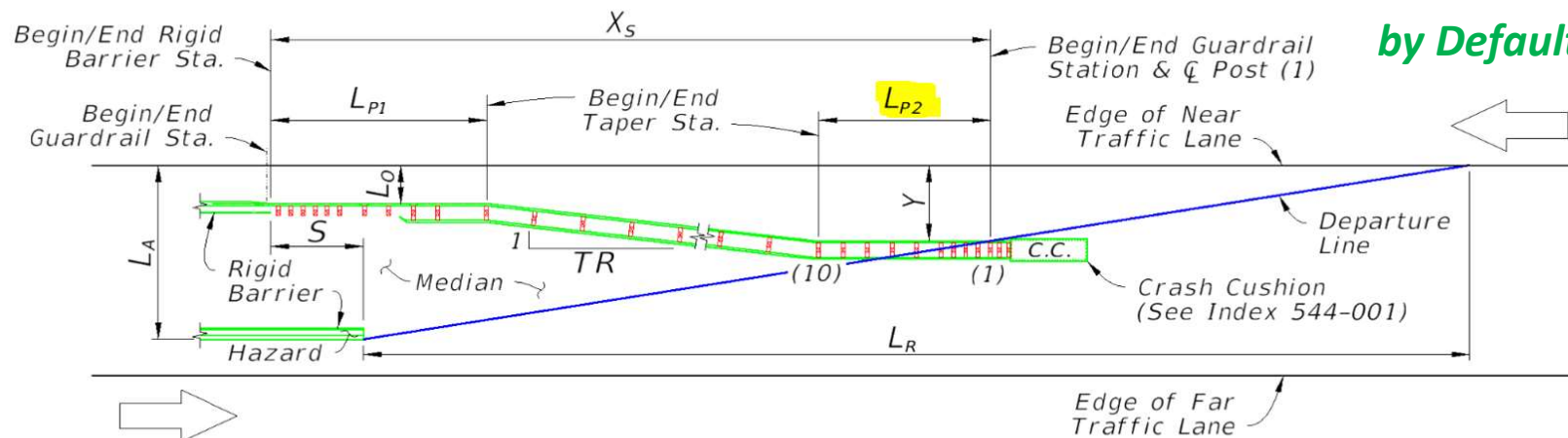
## Redeveloped – Standard Guardrail Transition

**Third Concept:**

### 'Standard Guardrail Transition'

- $L_{p2}$  = 'Length of Standard Guardrail Transition' by Default!

**PART C: CROSSOVER GUARDRAIL WITH 'CRASH CUSHION' -  
SHIELDING CONCRETE RAILING ACROSS MEDIAN (WITHIN CLEAR ZONE)**

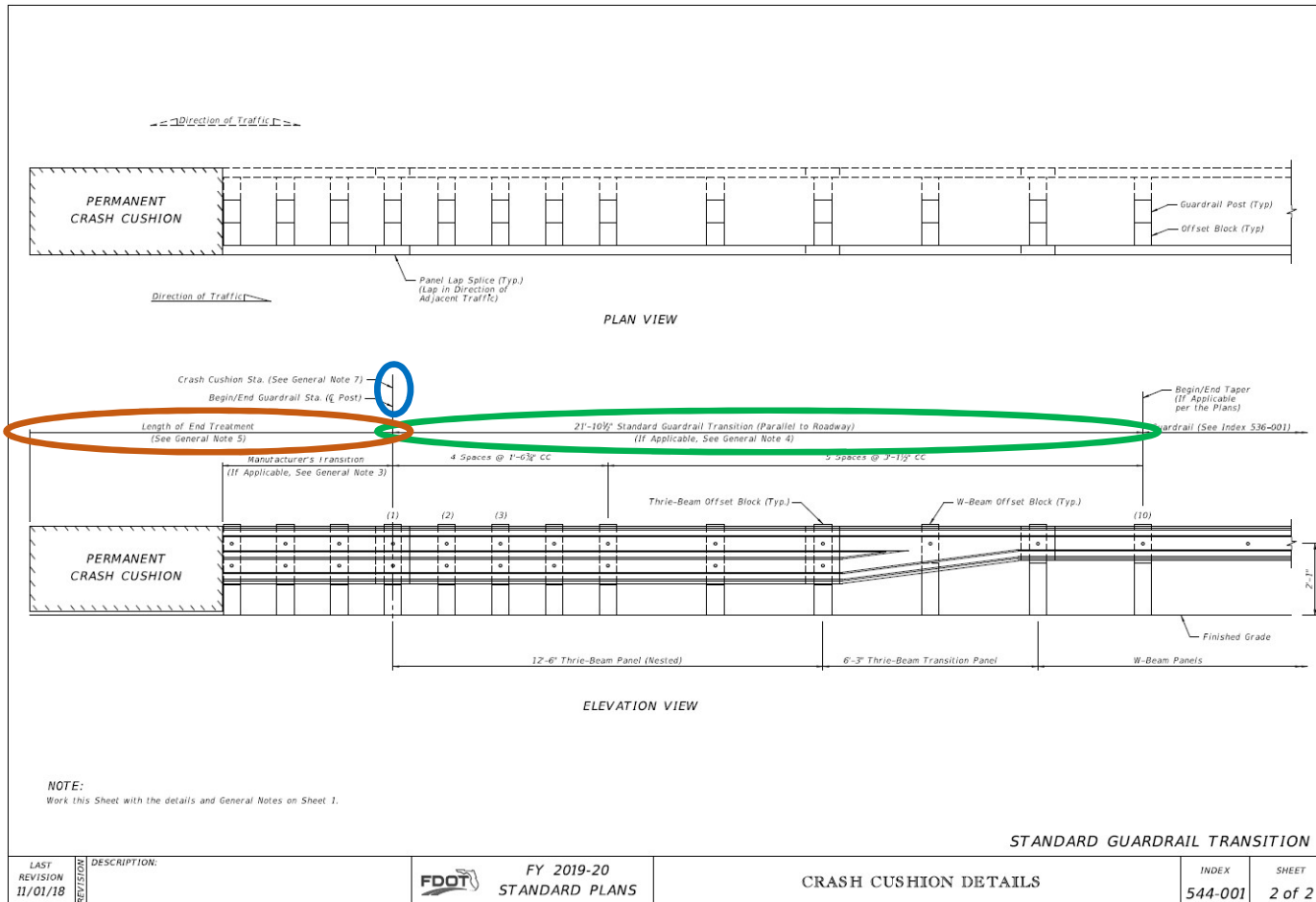


|   |             |  |
|---|-------------|--|
| <b>Parallel C.C. Trans. Length, <math>L_{p2}</math> (Ft.)</b> | <b>21.9</b> | <i>the length of the parallel segment required for Guardrail Transition, just beyond the taper. This is the length between Post (1) and Post (10) per Index 544-001 (21.9 Ft.)</i> |
|---|-------------|--|

## Sheet 2: *Redeveloped* – Standard Guardrail Transition

### Reminders!:

- ‘Standard Guardrail Transition’ is downstream of ‘LON’ point
- ‘Begin/End Guardrail Station,’ ‘Crash Cushion Station,’ and ‘LON’ point
- The ‘Length of End Treatment’ Treatment is upstream of the ‘LON’ point (27’-6” default)





## SPI: *Redeveloped Standard Plans Instructions*

Standard Plans Instructions  
Index 544-001 Crash Cushion Details

Topic No. 625-010-003  
FY 2019-20

### Index 544-001 Crash Cushion Details

#### Design Criteria

*AASHTO Roadside Design Guide* 4th Edition 2011; **FDOT Design Manual (FDM)**, *FDM 215*; *AASHTO Manual for Assessing Safety Hardware, MASH 2016*

#### Design Assumptions and Limitations

**Index 544-001** is only applicable for permanent crash cushion installations which shield the ends of Concrete Barrier and Guardrail.

For general usage information for crash cushions, see **FDM 215**. For a listing of crash cushion types and the corresponding usage limitations, see the Approved Products List (APL) webpage.

#### A. Location:

A crash cushion is located by the Crash Cushion Station, which corresponds the end station of the connecting barrier. See the drawings in **Index 544-001** for a depiction of the Crash Cushion Station for guardrail and concrete barrier connections.

Crash cushions are typically placed to shield the ends of barrier systems that are either providing median crossover protection or shielding against a hazard per Part B below. ....

### Topics Covered:

- A. 'Location' of callout station
- B. 'Length of Need' process
- C. 'Test Level' selection
- D. 'System Width' selection
- E. 'Length of End Treatment' (default value 27'-6")
- F. 'Constrained Conditions' (Methods for Reducing Space Needed for Crash Cushions)
- G. 'Temporary Crash Cushions' (where to look for more info)
- H. 'Alternative Crash Cushion Usage' (not barrier ends)

**SPI: *Redeveloped Standard Plans Instructions***

**Old Pay Item:**

~~544-75- AA~~ Crash Cushion, EA

AA= Type

1 (Optional) PENDING: Valid through 6-30-2019 lettings; replaced by 544-2- or 544-3- items.

**New Pay Items:**

➔ 544-2- Crash Cushion, TL-2, EA (45 mph or less)

A= Width

1 (Narrow)

2 (Wide)

➔ 544-3- Crash Cushion, TL-3, EA (Over 45 mph)

A= Width

1 (Narrow)

2 (Wide)

**Per SPI, Part D:**

- “Narrow” system: connects to barriers (or objects)...  
*24” width or less*
- “Wide” system: connects to barriers (or objects)...  
*Over 24” width*



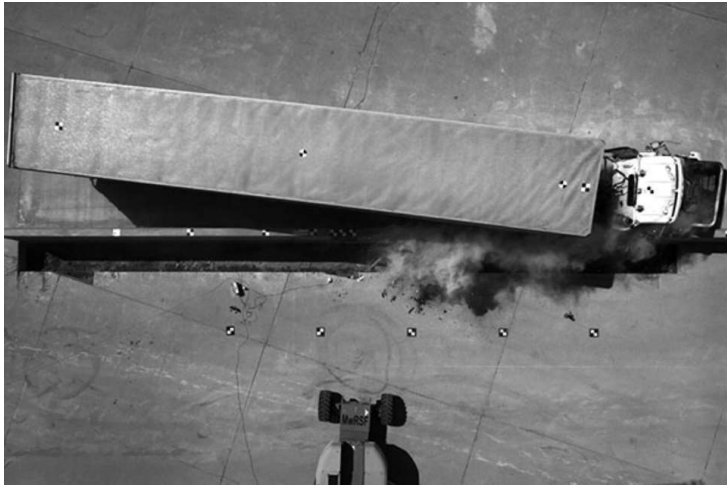












## Questions?



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