

Continuous Improvement

2023 DelDOT Lessons Learned

March 14, 2023



Excellence in Transportation.

Every Trip.

We strive to make every trip taken in Delaware safe, reliable and convenient for people and commerce.

Every Mode.

We provide safe choices for travelers in Delaware to access roads, rails, buses, airways, waterways, bike trails, and walking paths.

Every Dollar.

We seek the best value for every dollar spent for the benefit of all.

Everyone.

We engage our customers and employees with respect and courtesy as we deliver our services.





Agenda

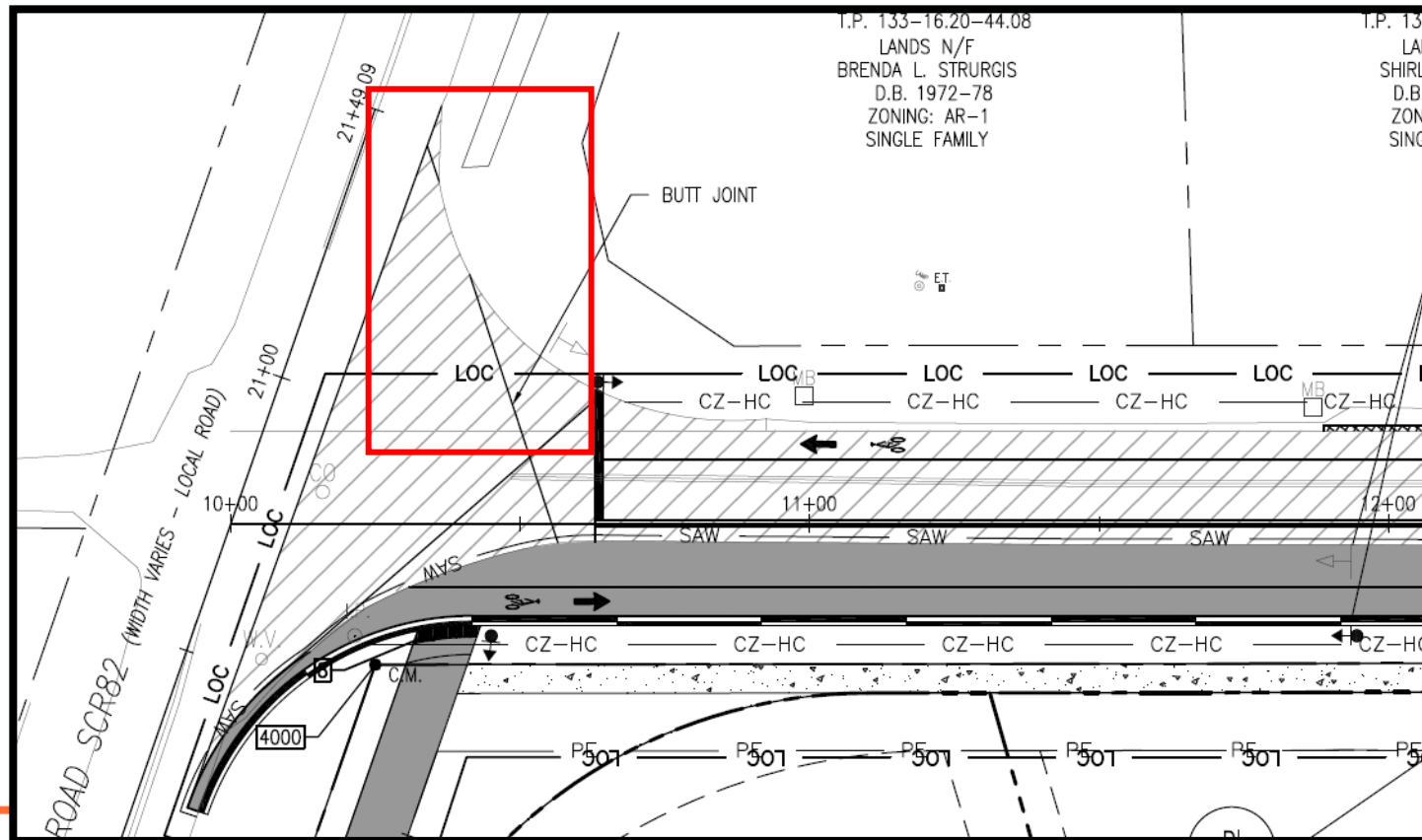
- Scoping
- Design
- Construction





Scoping – Pedestrian Connectivity (Missed Connection)

- Evaluate what is proposed on the project
- Also evaluate and consider what is adjacent for other potential improvements that are affected by the project





Scoping – Pedestrian Connectivity (Missed Connection)





Scoping – Pedestrian Connectivity (Alteration)

- Pedestrian facilities that are altered by roadway resurfacing are considered Alterations



28 CFR 35.151 (b) Alterations (1):

Each facility or part of a facility altered by, on behalf of, or for the use of a public entity in a manner that affects or could affect the usability of the facility or part of the facility shall, to the maximum extent feasible, be altered in such manner that the altered portion of the facility is readily accessible to and usable by individuals with disabilities, if the alteration was commenced after January 26, 1992.



Scoping – What's Wrong?





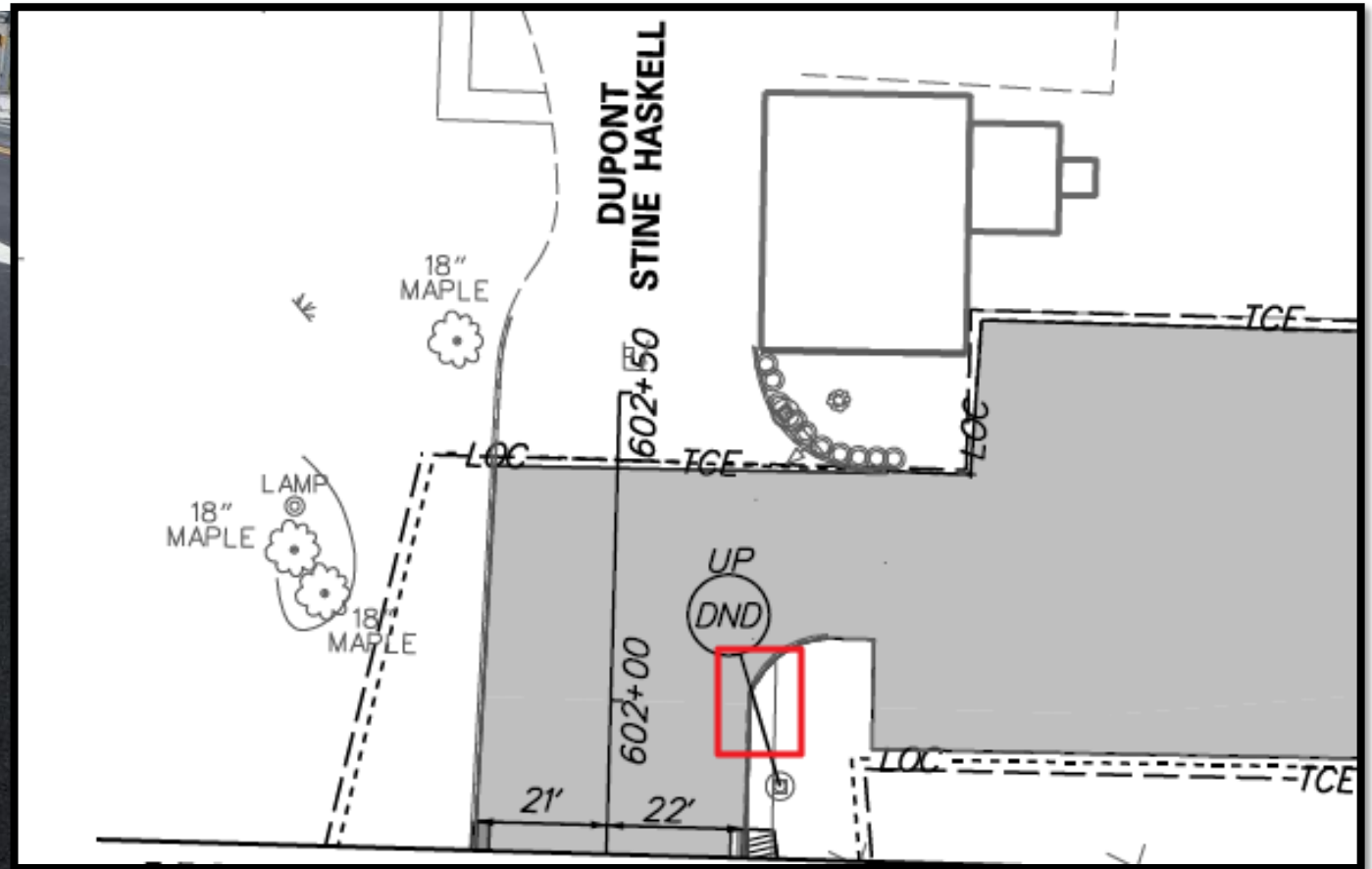
FIXED





Scoping – Pedestrian Connectivity (Alteration)

- Pedestrian facilities that are altered by roadway resurfacing are considered Alterations





POLL QUESTION

Which of these five items are most seen as deficient on the 2022 Primary Inspections?

- A. Pavement Joint Sealing
 - B. Signage (absence of, color, location, font)
 - C. Curb Joints
 - D. Breakaway Sleeves/Sign Hardware
 - E. Deficient? We are 100% *perfect!*
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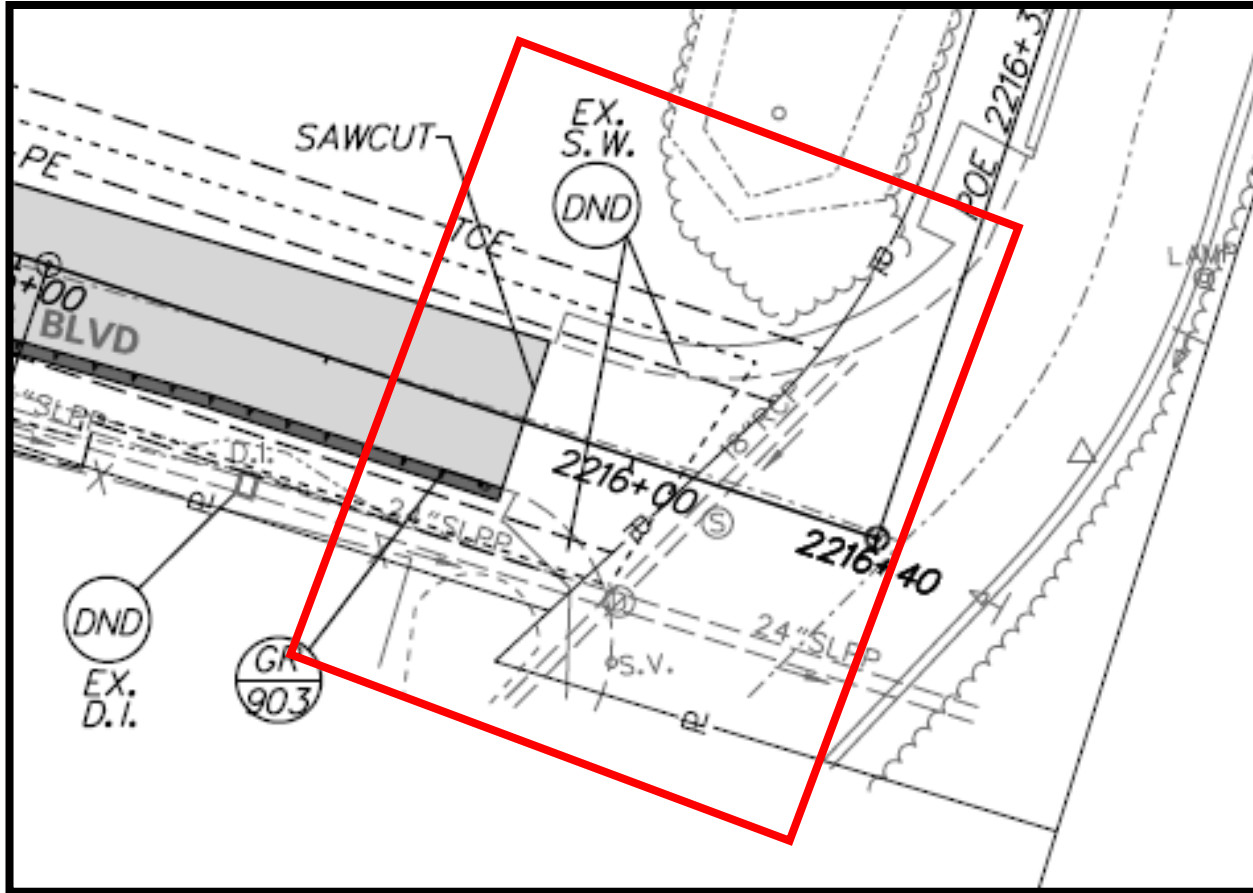
Scoping – Pedestrian Connectivity (LOC)



- Existing paving limits are clear
- Pre-existing pedestrian crossing
- What gets placed on the plans for limits?



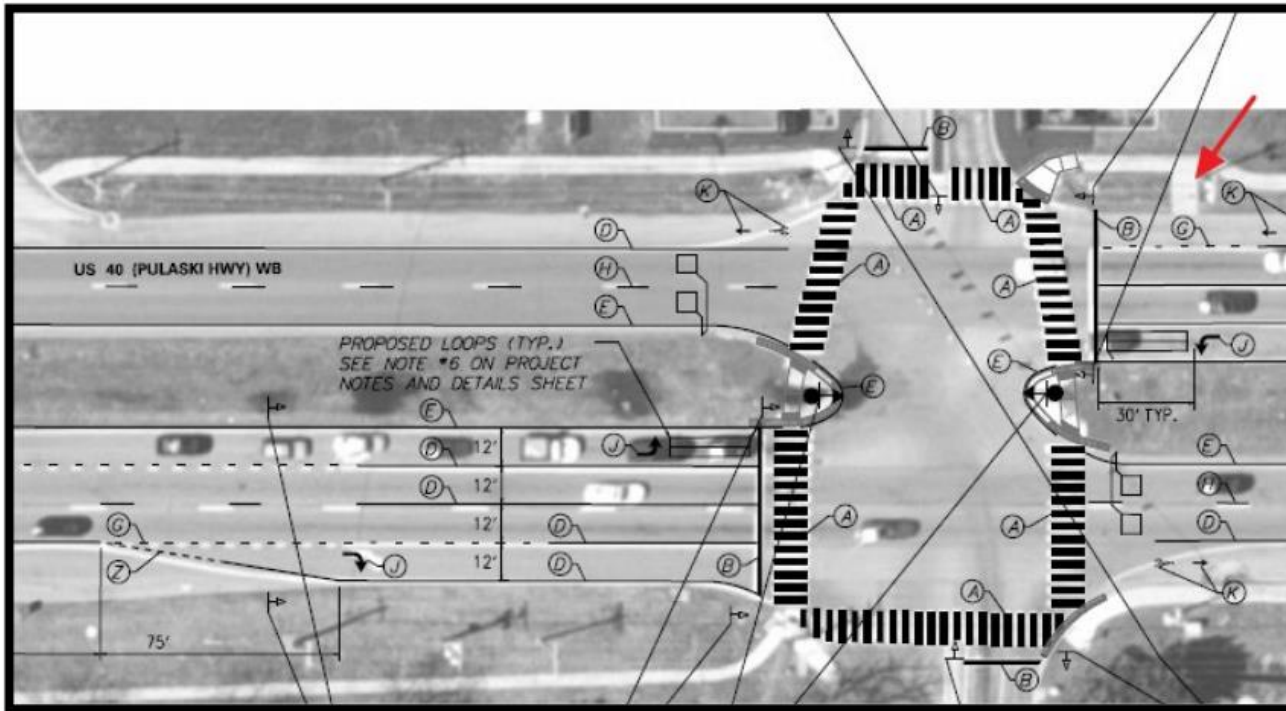
Scoping – Pedestrian Connectivity (LOC)



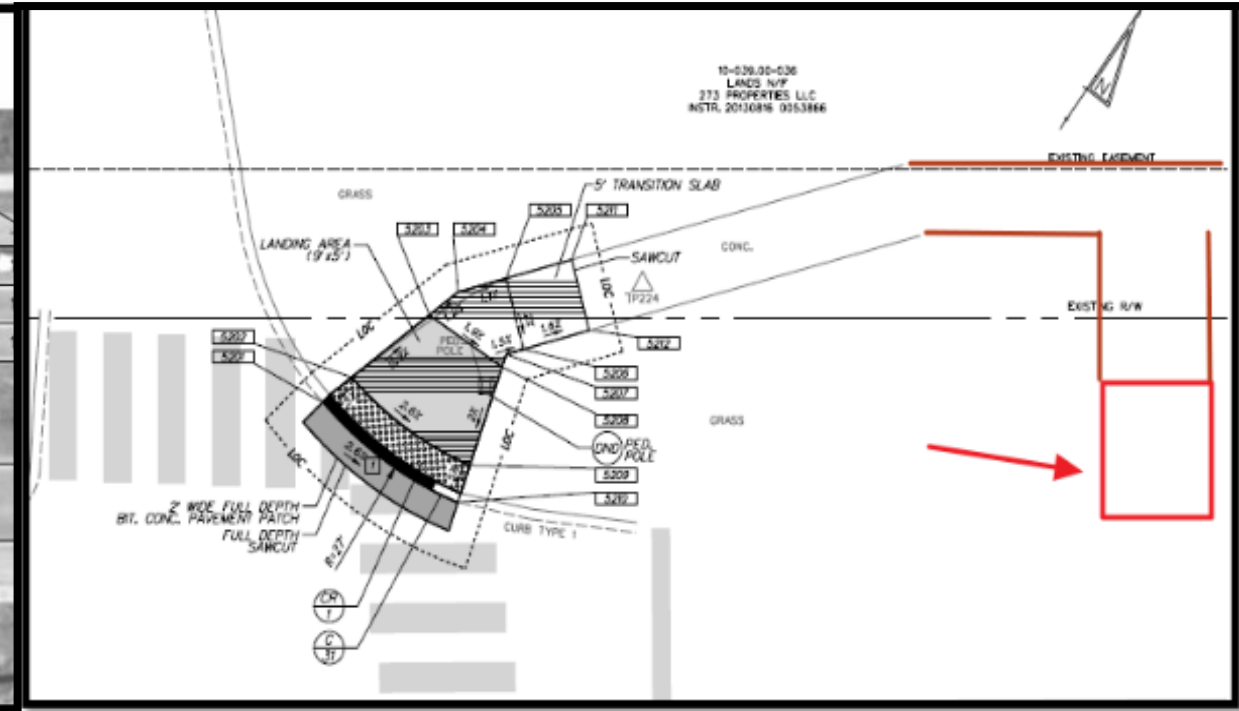


Scoping – Pedestrian Connectivity (Transit)

- Design provided for adjacent curb ramp, not provided to improve the non-compliant bus pad



Snapshot taken from the Approved Plans, Sheet 59

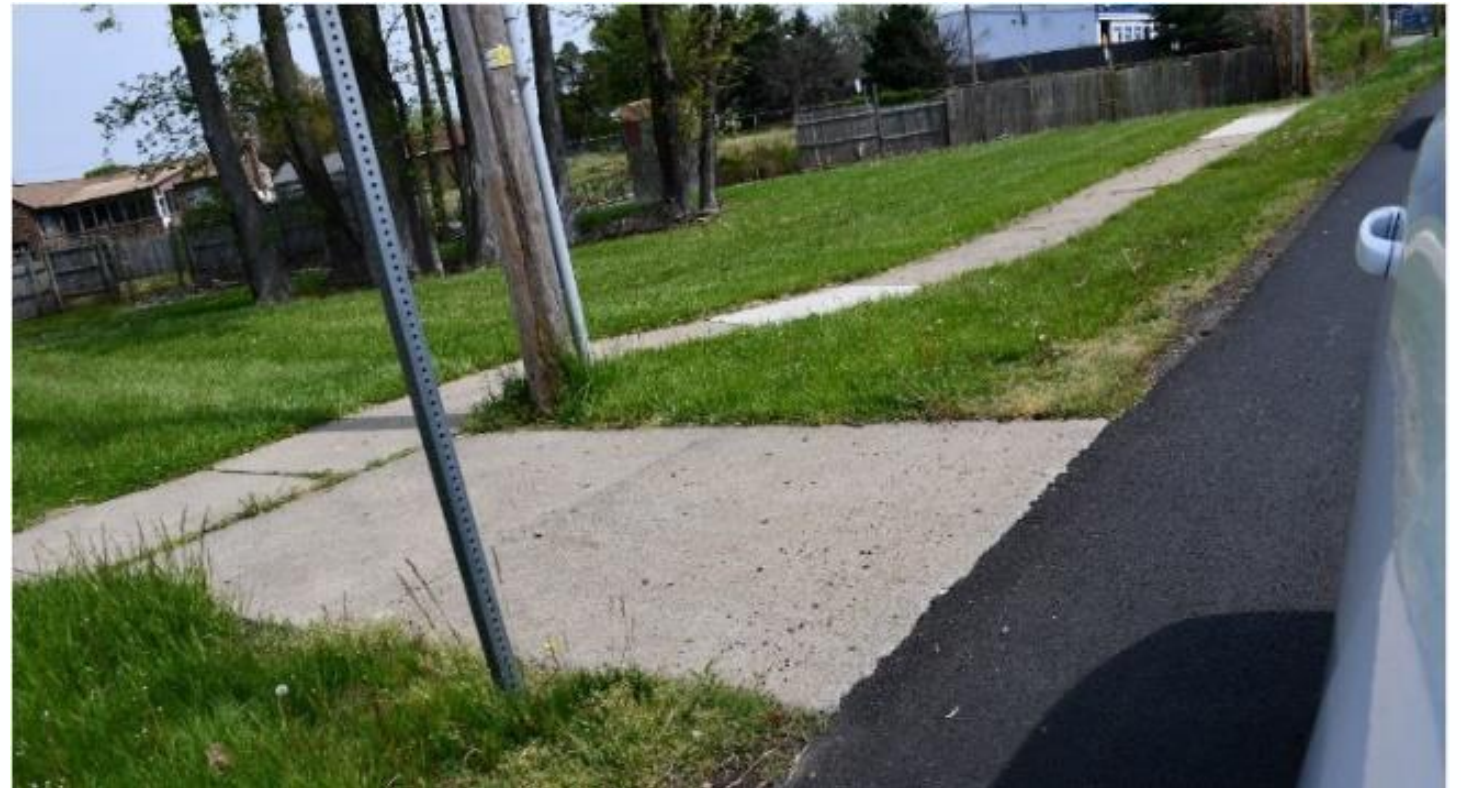
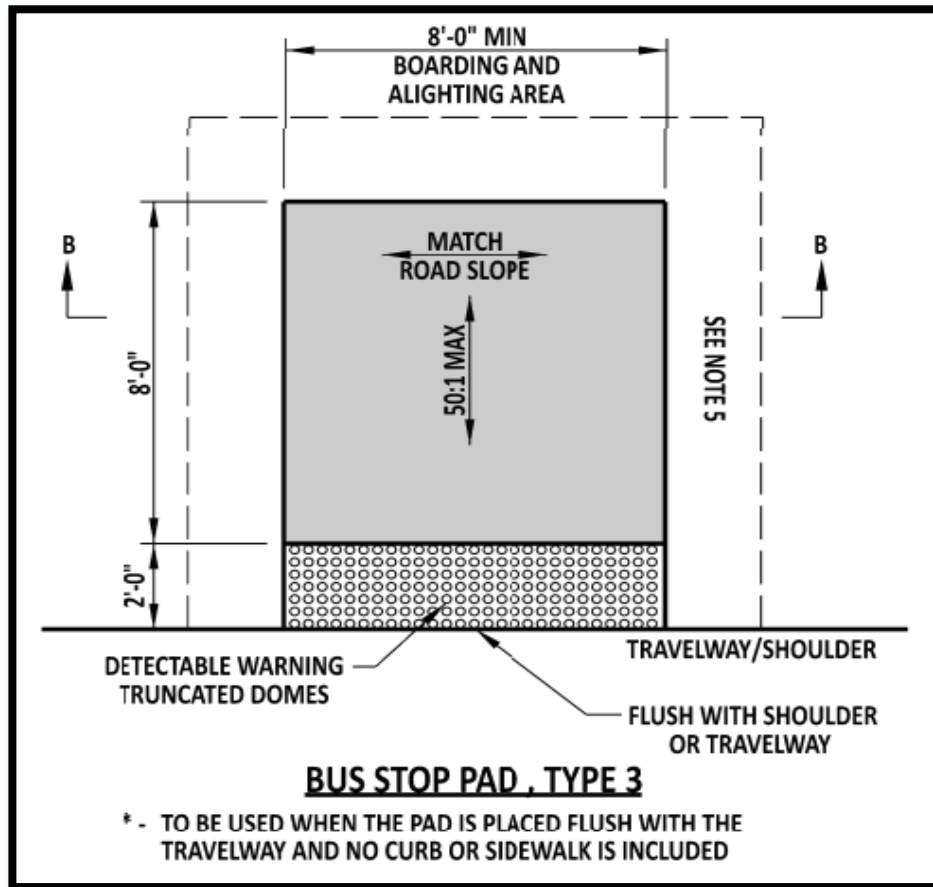


Snapshot taken from the Approved Plans (Construction Details), Sheet



Scoping – Pedestrian Connectivity (Transit)

- Bus pad was known to be noncompliant in the ADA Inventory (image on left)





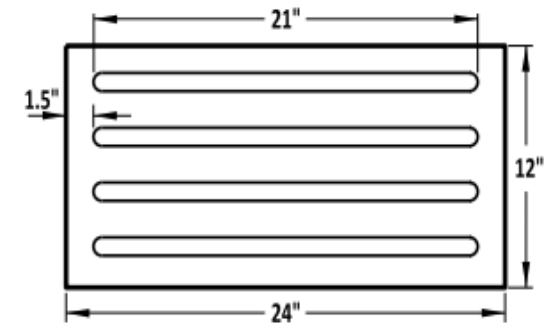
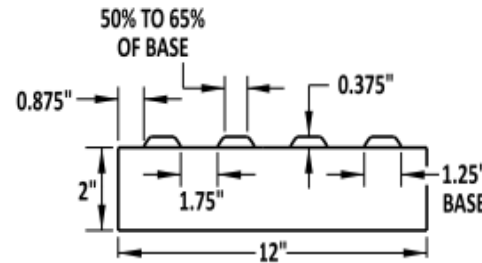
Designer Primary Inspection Attendance

- Design/EoR presence at Primary Inspection is ideal to answer questions. Not the VP but the designer.
 - To Provide Accurate Information - Paramount
 - To Resolve (everything) in a Timely and Professional Manner

- The Primary Inspection includes the following attending sections:
 - i. Administering Section
 - ii. Contractor
 - iii. M&O
 - iv. Designer
 - v. Engineering Support



Bike Slip Ramps and DTSI Installations



DIRECTIONAL TACTILE SURFACE INDICATORS FOR BICYCLE RAMPS

DETECTABLE WARNING SURFACE NOTES:

- 1). THE DETECTABLE WARNING SURFACE SHALL EXTEND A MINIMUM OF 2'-0" IN THE DIRECTION OF PEDESTRIAN TRAVEL AND EXTEND THE FULL WIDTH OF THE DEPRESSED CURB.
- 2). THE DETECTABLE WARNING SURFACE SHALL NOT BE PLACED ACROSS A GRADE BREAK.
- 3). WHERE THERE IS NO DEPRESSED CURB AT A MEDIAN CUT-THROUGH OF PEDESTRIAN CONNECTION, INSTALL THE DETECTABLE WARNING SURFACE A MINIMUM OF 8" FROM THE PAVEMENT EDGE.
- 4). THE DETECTABLE WARNING SURFACE MAY BE OMITTED WITH APPROVAL OF THE ENGINEER AT CUT-THROUGH LOCATIONS WHERE THE DETECTABLE WARNING SURFACE WILL BE SEPARATED BY 2'-0" OR LESS.
- 5). PLACE DETECTABLE WARNING SURFACES AS FOLLOWS:
 - A). PERPENDICULAR CURB RAMPS - SEE ABOVE FIGURE FOR PERPENDICULAR CURB RAMP APPLICATIONS. WHERE D IS LESS THAN OR EQUAL TO 5'-0", PLACE THE DETECTABLE WARNING SURFACE PERPENDICULAR TO THE RAMP AT THE BOTTOM GRADE BREAK. WHERE D IS GREATER THAN 5'-0", PLACE AT THE BACK OF CURB.
 - B). PARALLEL CURB RAMPS - PLACE AT THE BACK OF CURB ALONG THE ENTIRE LENGTH OF THE DEPRESSED CURB.
 - C). DEPRESSED CORNERS - PLACE AT THE BACK OF CURB ALONG THE ENTIRE LENGTH OF THE DEPRESSED CURB.
- 6). PLACE DIRECTIONAL TACTILE SURFACE INDICATORS ADJACENT TO THE SHARED USE PATH.



Bike Slip Ramps and DTSI Installations

- Directional Tactile Surface Indicators (DTSI) are to be installed within a bike ramp directly adjacent and parallel to an SUP
- The raised portions of the DTSI are to delineate the PAR for pedestrians
- The below examples have Detectable Warning Surface (DWS) panels installed in the proper location, but DTSI should have been installed





DTSI Examples





POLL QUESTION

How many Primary Inspections were performed in 2022?

- A. 153
 - B. 96
 - C. 114
 - D. 78
 - E. What's a Primary Inspection?
-



POLL QUESTION

How many Primary Inspections were performed in 2022?

A. 153

B. 96

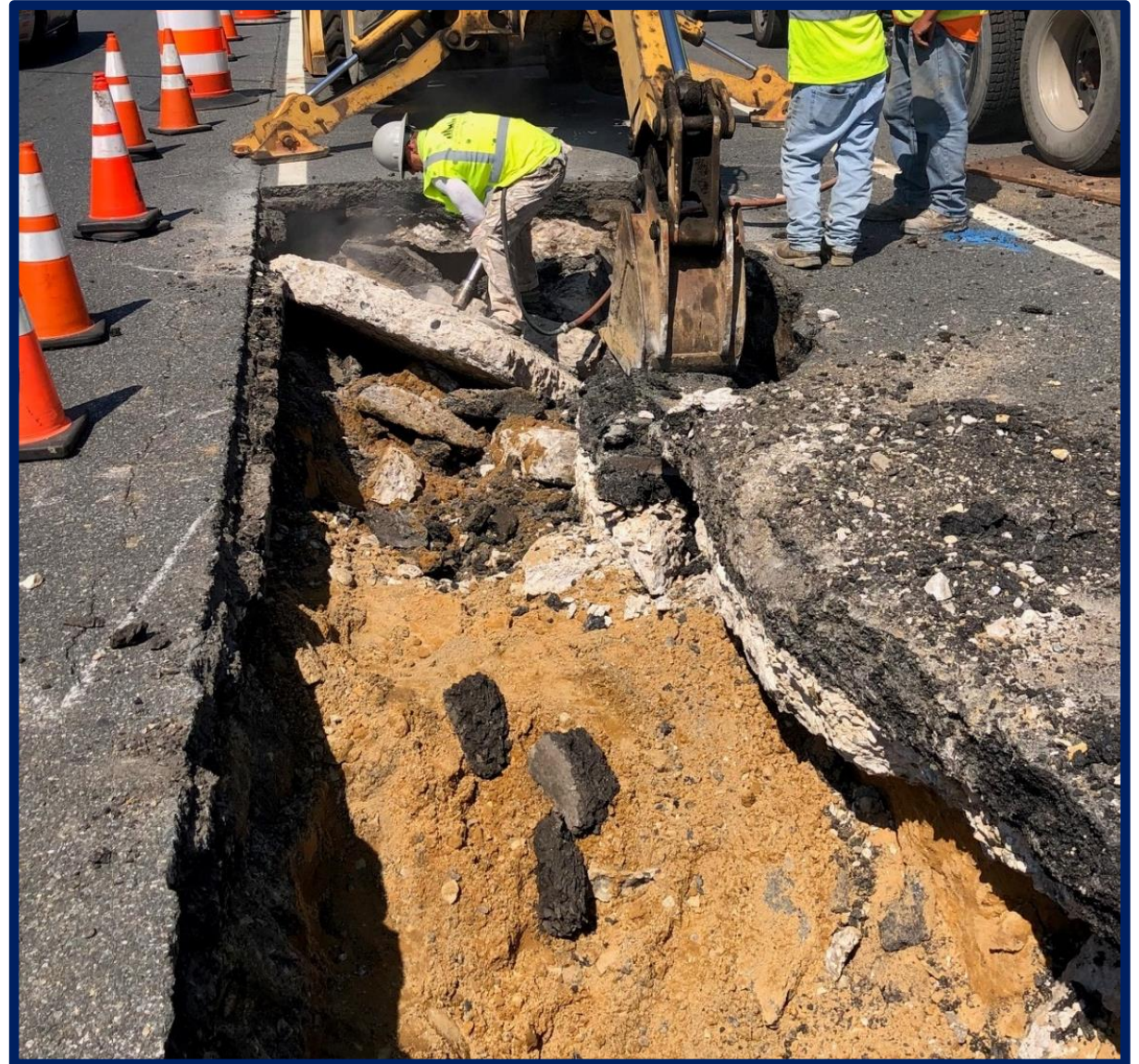
C. 114

D. 78

E. What's a Primary Inspection?

SINKHOLE ANSWERS

- How bad is the damage under the road?
 - It was pretty big!
 - It did not span more than one lane.
 - Fortunate that we got there when we did.
 - It was literally falling in when we pulled up.





Drainage Inlets



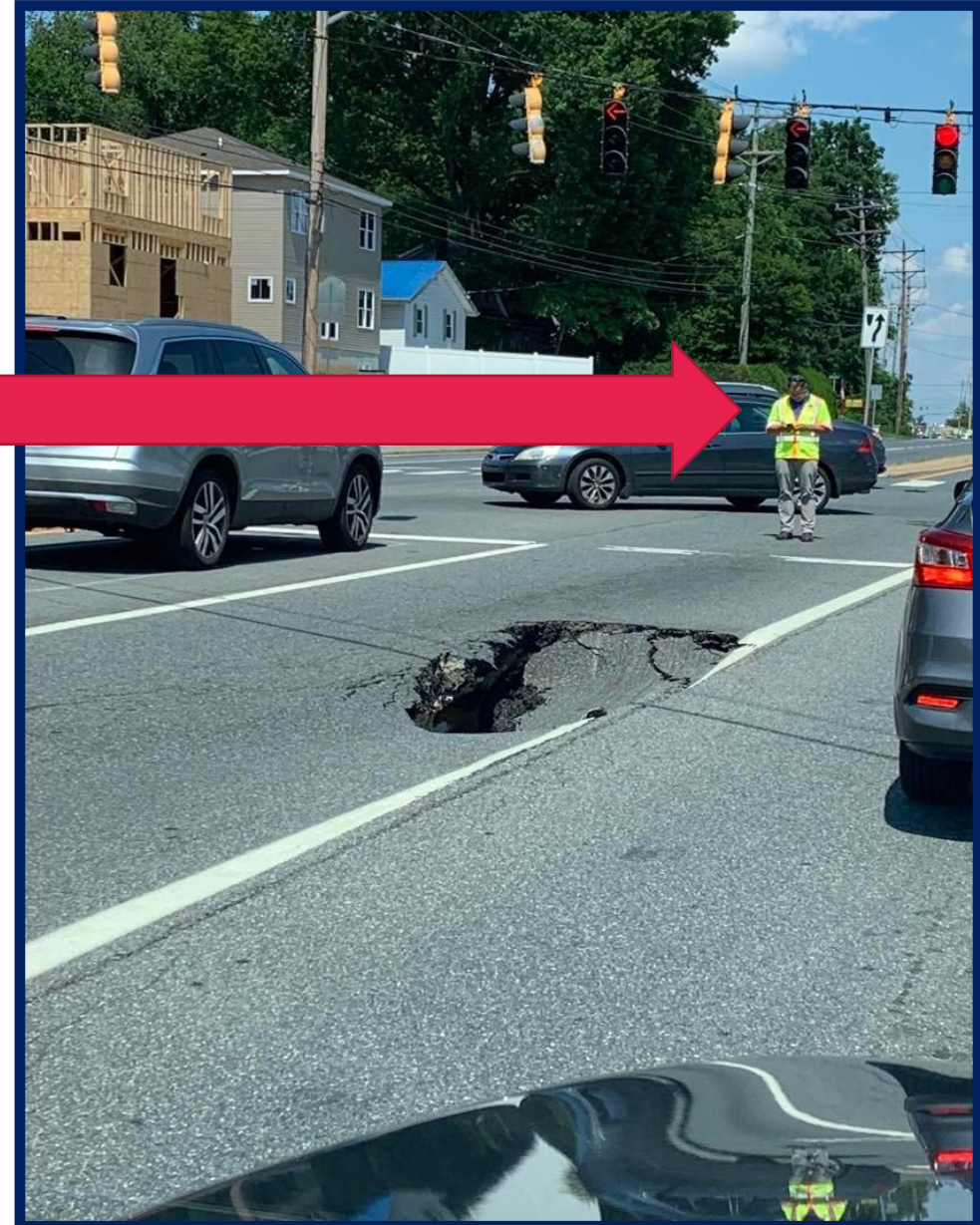
9. Ensure inlet and outlet pipes are the same size and type as the connecting pipes shown in the contract and that pipes extend through, and are flush with, the inside of the wall. When cutting off the end of a reinforced concrete pipe, finish with mortar so that no reinforcement steel remains exposed. Fill any space between the pipe and the walls of the drainage inlet with non-shrink grout conforming to the requirements of Section 1047, with a minimum strength of 5,000 PSI. Ensure that the pipe opening in the drainage inlet is no more than 4 inches larger than the pipe diameter measured from the outside wall of the pipe.

SINKHOLE ANSWERS

- We put our best guy on the job!

- Ladies and gentlemen, MR. John Garcia!

- Remember this photo!





Design Considerations – Curb Openings

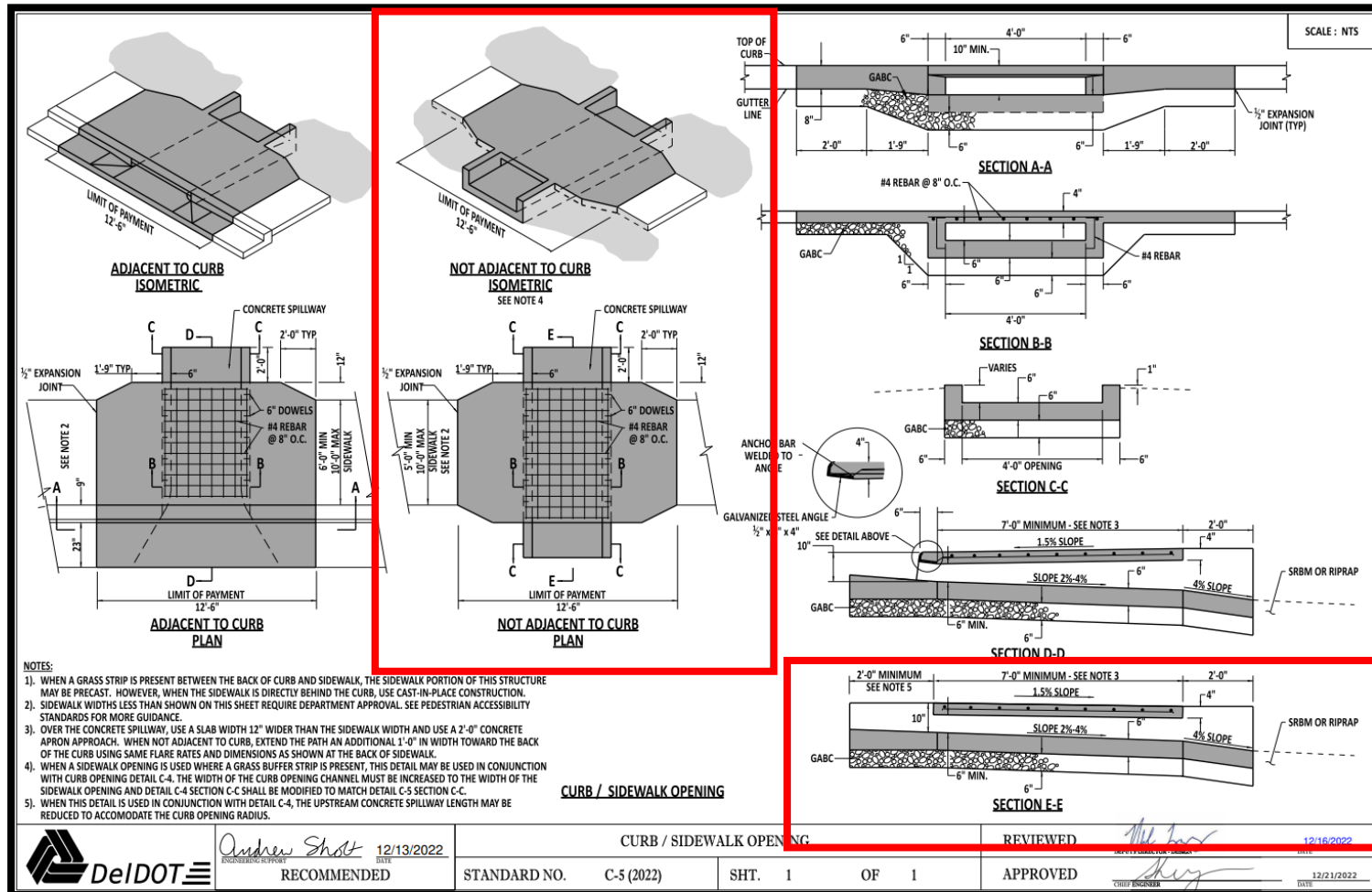
- Maintenance – lengthy enclosure, flat slopes, difficult to keep free of debris/sediment for drainage





Design Considerations – Curb Openings

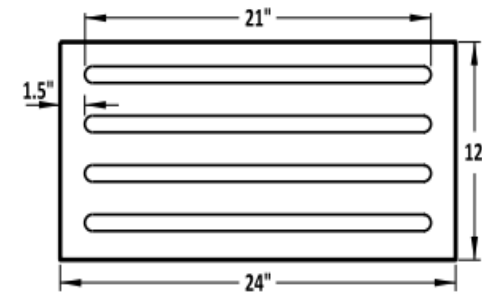
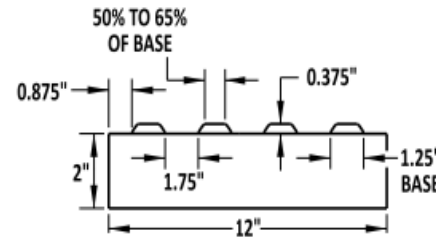
New Standard Construction Detail (2022) for Curb Opening Not Adjacent to Curb





Design Considerations – Curb Openings

- What are these? Pedestrian Circulation Path features? Consider tactile and visual edge indicators/detection to ensure users continue along designated PAR.



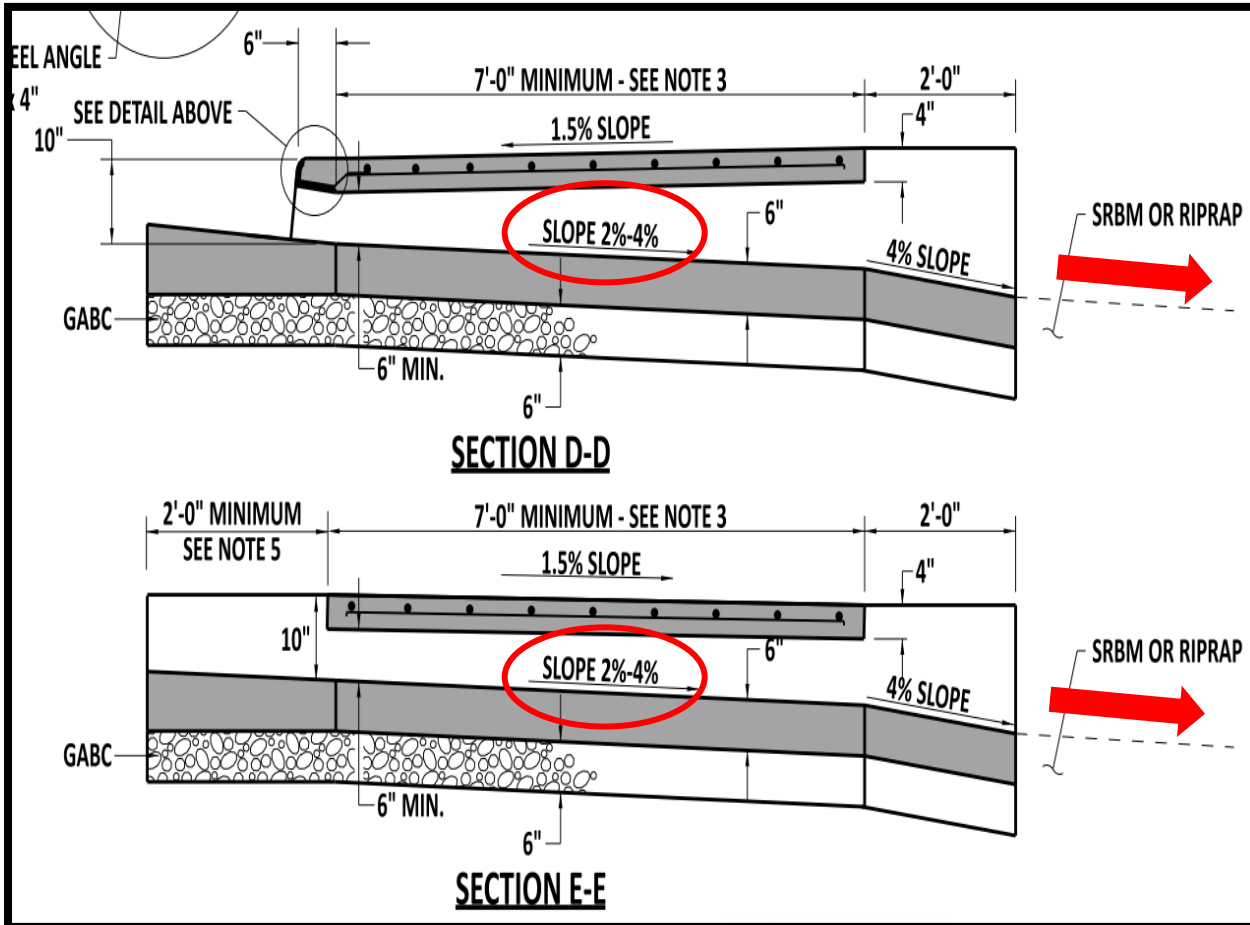
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Design Considerations – Curb Openings





Design Considerations – Curb Ramp Drainage

3.2.5.5 Drainage Consideration

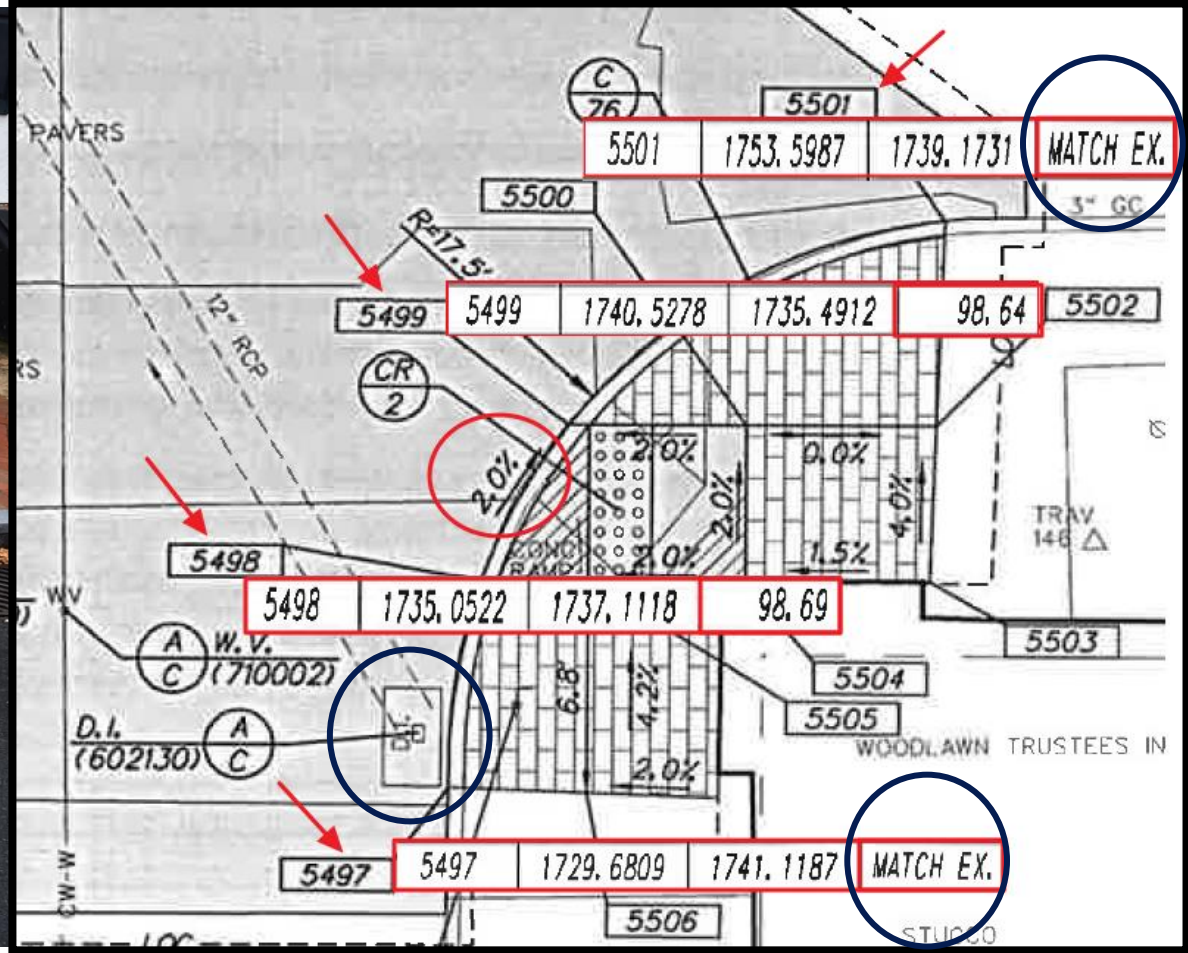
Standard:

01 Curb ramps and blended transitions shall be designed to prevent the accumulation of water. (405.10)





Design Considerations – Curb Ramp Drainage





POLL QUESTION

What is the timeframe for the Primary Inspection Punch List to be sent to the Contractor?

- A. 15 week days
 - B. 14 calendar days
 - C. 10 week days
 - D. 7 calendar days
 - E. 5 week days
-



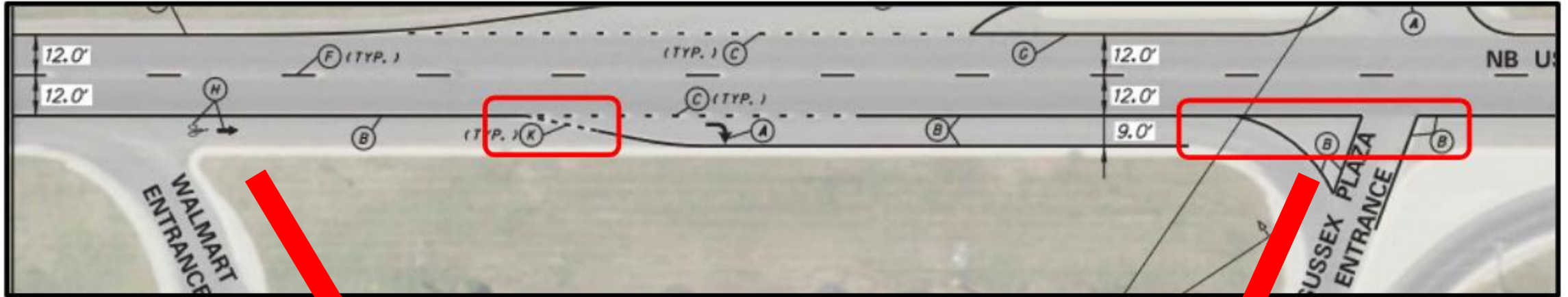
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Pavement Marking Consideration for Bicycles

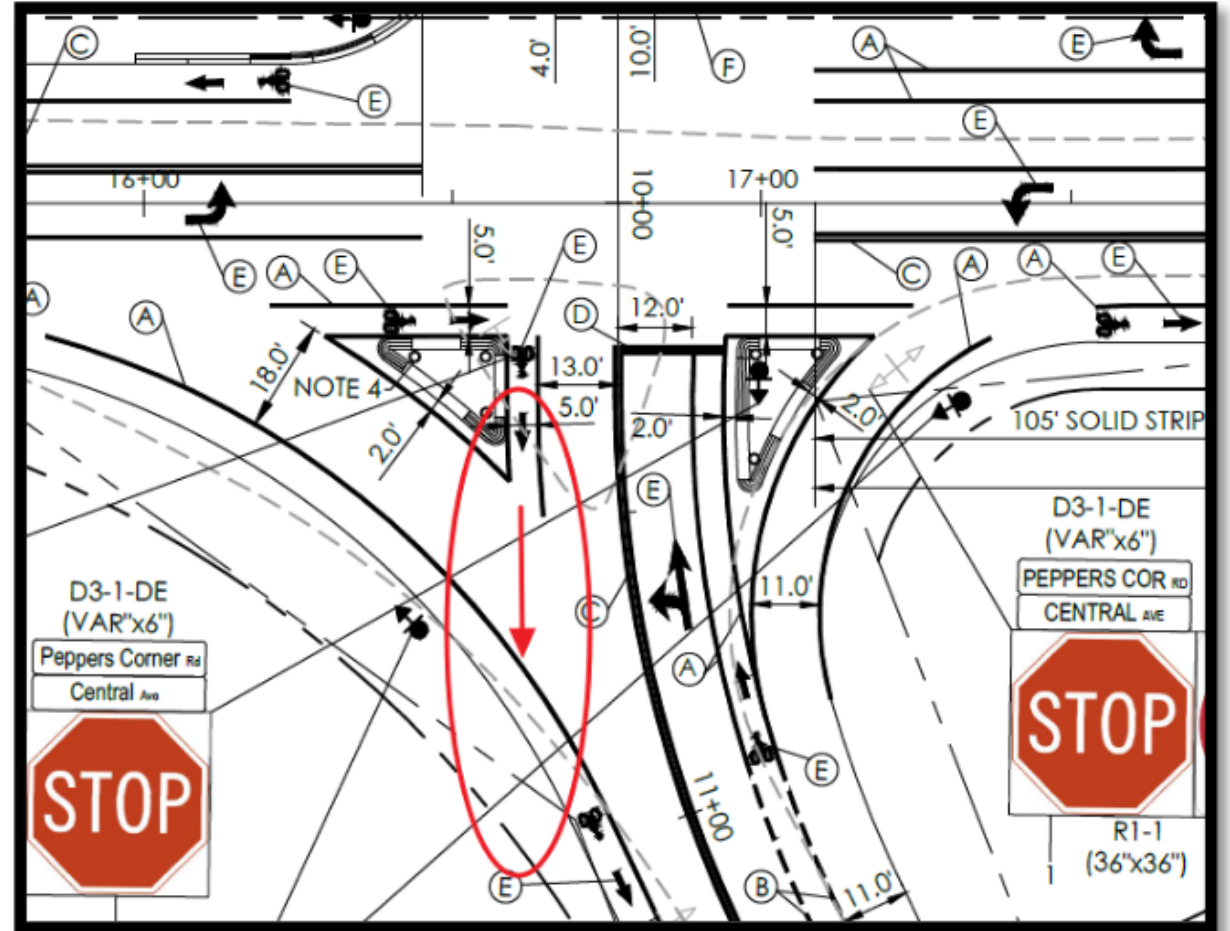


Snapshot taken from the Approved Plans, Sheets 12





Pavement Marking Consideration for Bicycles



Snapshot taken from the Approved Plans, Sheet 19



Follow-Up...

- Depressed CC (curb-cut) shown on Plans
 - Crosswalk realigned and pre-existing curb ramp left in-place

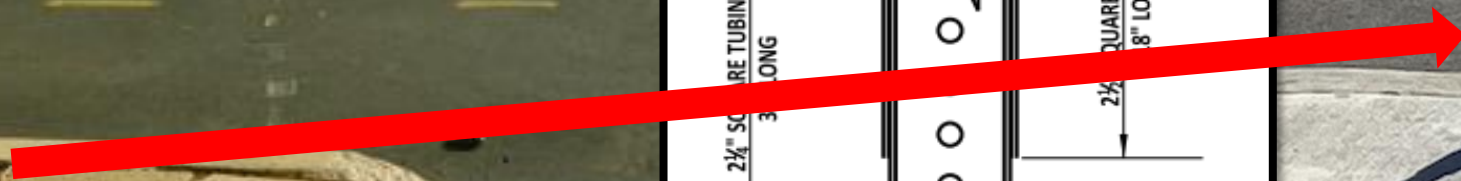
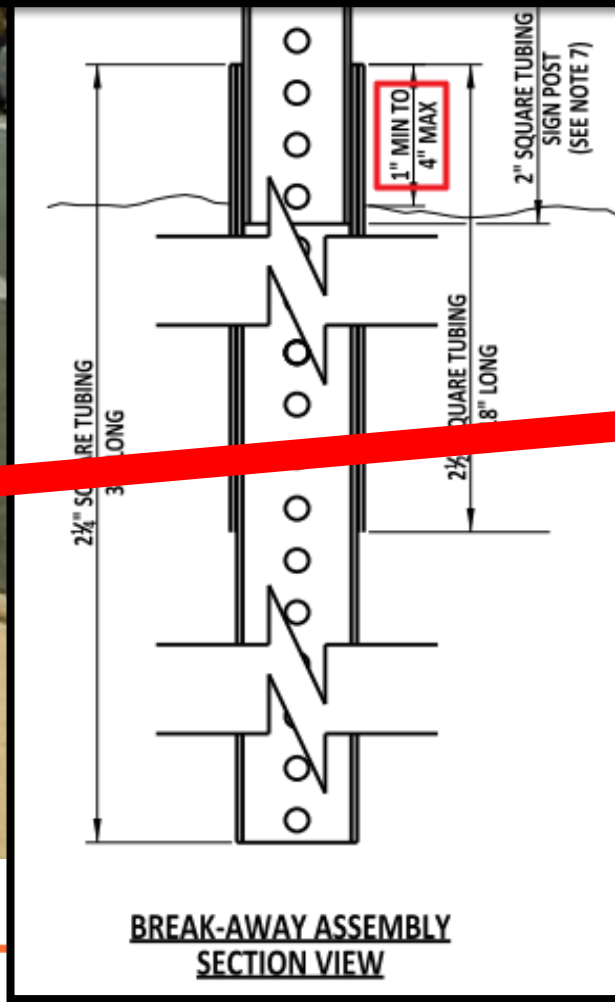




Sign Installations

BREAKWAY SIGN POST AND PIN ASSEMBLY DETAILS

STANDARD NO. T-15 (2022) SHT. 1 OF 1



**BREAK-AWAY ASSEMBLY
SECTION VIEW**



POLL QUESTION

What happens when the Administering Section notifies the District that all punch list items are addressed?

- A. An annotated punch list is sent and M&O has 30 days to verify prior to M&O acceptance
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 - D. ADA inspection process begins
 - E. Contractor can finally submit any Formal Claims
-



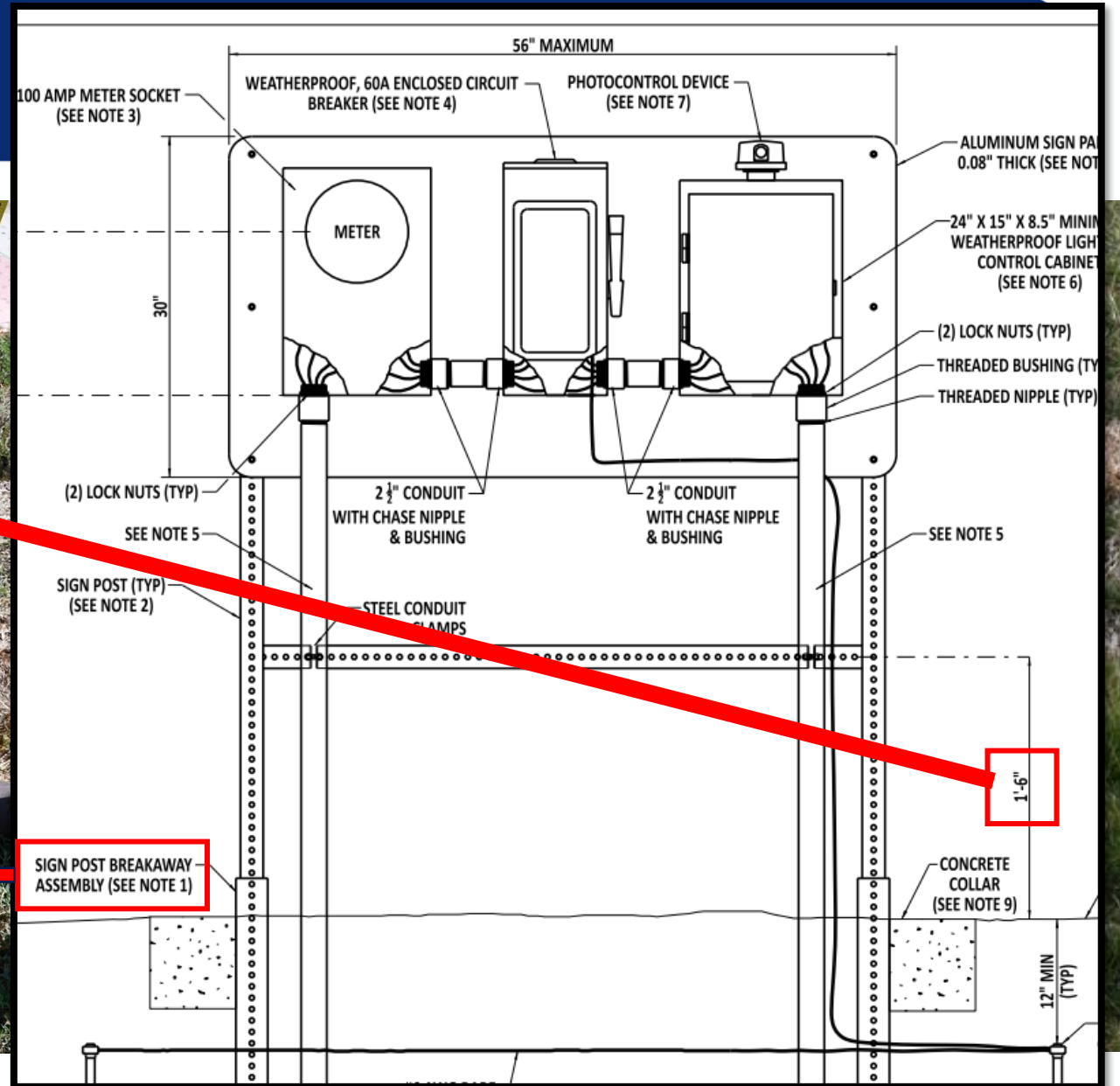
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Sign Installations





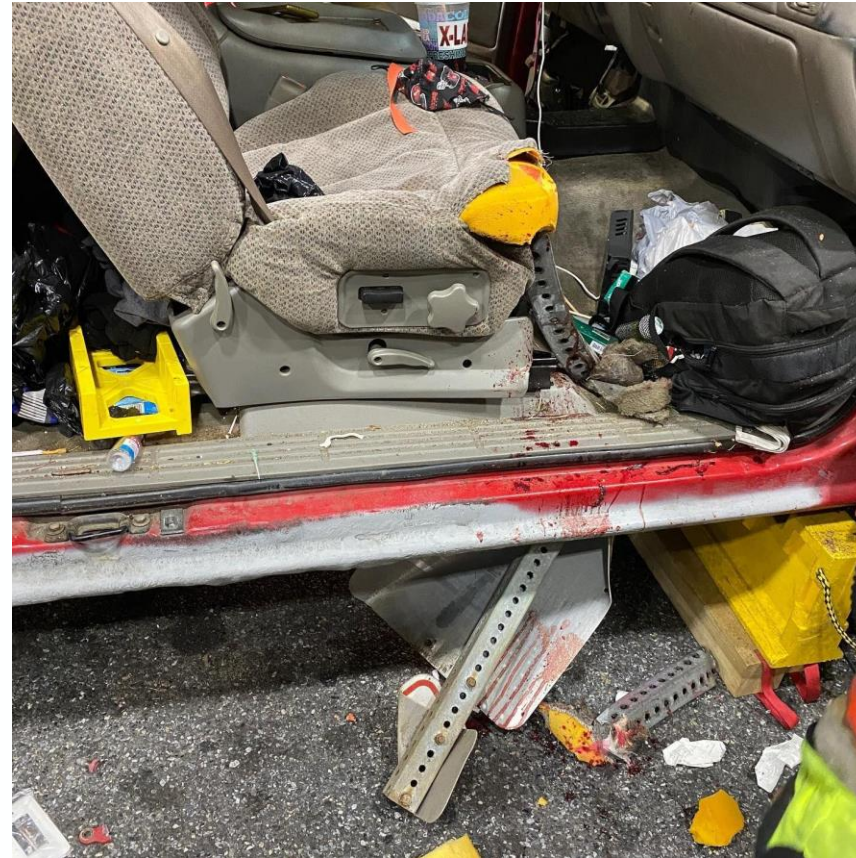
Sign Installations

Every Trip • Every Mode • Every Dollar • Everyone

Dover firefighters work to free person impaled by street sign in vehicle

WDEL, Aug 26, 2021

- Sign stubs require proper embedment to perform properly
- Snagging hazard
- Sign may pull from ground versus yielding





Tubular Delineators

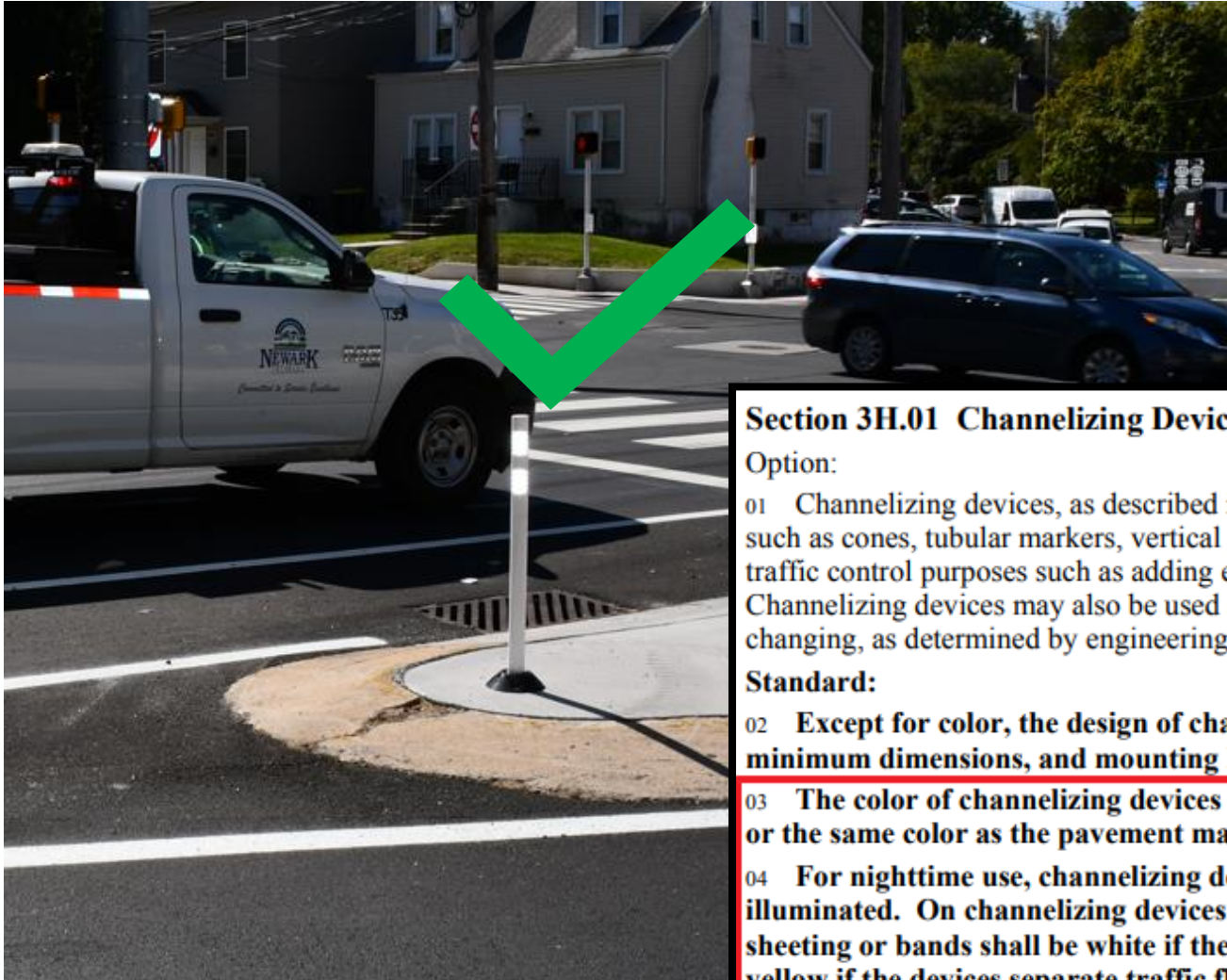
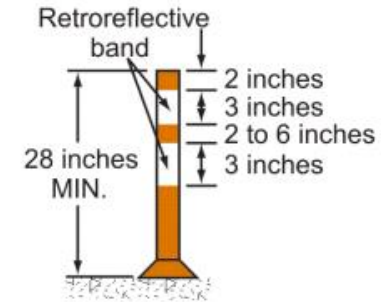


Figure 6F-7. Channelizing Devices
(Delaware Revision)



TUBULAR MARKERS

Section 3H.01 Channelizing Devices

Option:

01 Channelizing devices, as described in Sections 6F.63 through 6F.73, and 6F.75, and as shown in **Figure 6F-7**, such as cones, tubular markers, vertical panels, drums, lane separators, and raised islands, may be used for general traffic control purposes such as adding emphasis to reversible lane delineation, channelizing lines, or islands. Channelizing devices may also be used along a center line to preclude turns or along lane lines to preclude lane changing, as determined by engineering judgment.

Standard:

- 02 Except for color, the design of channelizing devices, including but not limited to retroreflectivity, minimum dimensions, and mounting height, shall comply with the provisions of Chapter 6F.
- 03 The color of channelizing devices used outside of temporary traffic control zones shall be either orange or the same color as the pavement marking that they supplement, or for which they are substituted.
- 04 For nighttime use, channelizing devices shall be retroreflective (as described in Part 6) or internally illuminated. On channelizing devices used outside of temporary traffic control zones, retroreflective sheeting or bands shall be white if the devices separate traffic flows in the same direction and shall be yellow if the devices separate traffic flows in the opposite direction or are placed along the left-hand edge line of a one-way roadway or ramp.



Tubular Delineators

SECTION 702 — TRIANGULAR CHANNELIZING ISLANDS

702.1 Description.

This work consists of constructing triangular channelizing islands.

702.2 Materials.

- | | |
|-----------------------------|--------------|
| A. Bituminous Patching | Section 402 |
| B. Delineator | Section 1073 |
| C. Bituminous Pavement | Section 1014 |
| D. PCC, Class B | Section 1022 |
| E. Curing Compound | Section 1022 |
| F. Expansion Joint Material | Section 1042 |

12. Provide and install delineators on the **leading ends or corners of the island** in accordance with section 824.

SECTION 824 — DELINEATORS

824.1 Description.

This work consists of providing, installing, relocating, maintaining, and replacing high performance flexible plastic, post-mounted delineation devices or delineators reflectors mounted on posts or barriers.

824.2 Materials.

- | | |
|----------------|--------------|
| A. Delineators | Section 1073 |
|----------------|--------------|

824.3 Construction.

- A. High Performance Flexible Plastic Delineators.
1. Provide high performance flexible plastic delineators meeting the requirements of the [DE MUTCD](#), and in accordance with the contract.
 2. Remove loose debris from the road surface in the application area.
 3. Install and anchor delineators on dry asphalt or concrete surfaces in accordance with the manufacturer's instructions. Ensure that the installation method allows for easy replacement of future damaged delineators.
 4. Replace damaged delineators within 24 hours of notification by the engineer.





Vertical Surface Discontinuities



3.1.5.2.1 Vertical

Standard:

- 01 Changes in level of 0'-0.25" high maximum shall be permitted to be vertical. (303.2)

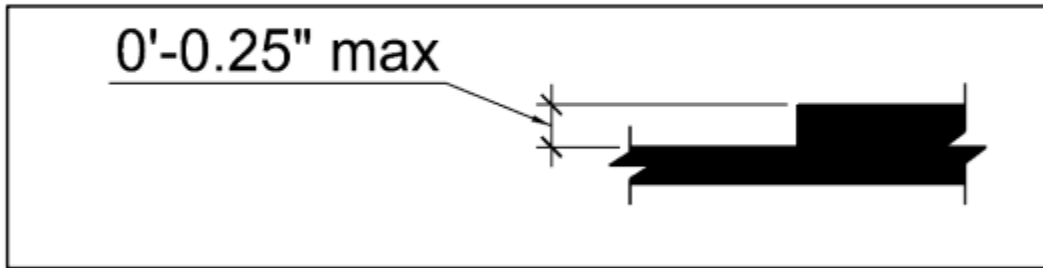


Figure 3.1.5.2.1 Vertical Change in Level (303.2)

3.1.5.2.2 Beveled

Standard:

- 01 Vertical surface discontinuities between 0'-0.25" and 0'-0.50" shall be beveled with a slope not steeper than 50 percent. The bevel shall be applied across the entire vertical surface discontinuity (R302.7.2)

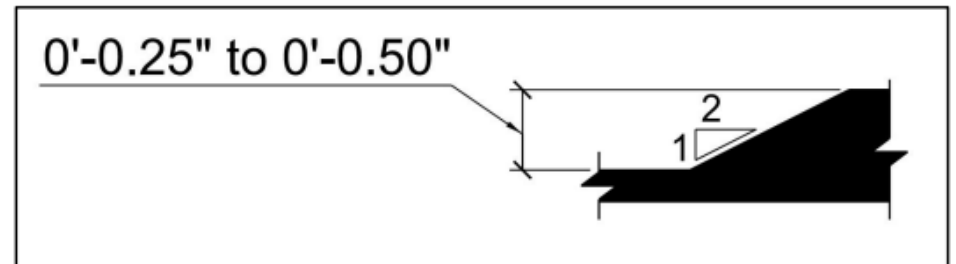


Figure 3.1.5.2.2 Beveled Change in Level (R302.7.2)

Thank You!

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Division of Transportation Solutions
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Mark Luszcz

Deputy Director (Operations & Support)
Division of Transportation Solutions
Mark.Luszcz@delaware.gov

