Lessons Learned: Inspection Observations

JOHN CARUANO
DELDOT SUPPORT ENGINEER
Inspection Observations

- Inspection Process Framework
  - Overview and Observations
  - Monthly Meetings
  - Evaluating Process and data

- Good Examples and Lessons to be Learned
Inspection Framework

- Semi-Final and Final Initial and Primary
- Appropriate Staff Attendance
- Alleviate Multiple Punch lists
- Timelier Acceptance of Projects
- Established timelines

MEMORANDUM

TO: All of Transportation Solutions
    All of Maintenance and Operations
    All of Planning

FROM: Sheryl Hastings, Chief Engineer, Transportation Solutions
      Drew Boyce, Director, Planning

DATE: February 11, 2020

SUBJECT: New Inspection Framework

Attached is the new Inspection Framework for the inspection and acceptance of projects into the Department’s maintenance responsibility. This new framework is intended to have all the appropriate staff attend the field inspections to answer questions, learn, and allow issues to be discussed and handled in a timely manner. It is also intended to alleviate multiple punch lists for the contractors to address and to allow for the timelier acceptance of projects.

You will notice new terminology for the inspections, which is intentional as this is a new process. The intent is for 2020 to be a trial implementation period to learn the benefits of and to identify issues with this new process. At the end of 2020, assuming enough data is available, the process will be reviewed, and adjustments will be made as deemed necessary.

We expect full participation of the appropriate staff at the appropriate level to ensure timeliness of the reporting and action items. Implementation will be effective March 1, 2020.

Any questions or concerns should be directed to Maureen Kelley, Chief of Environmental and Administrative Support.

SH/brm
Inspection Framework

- **Initial Inspection**
  - Completed by Administering Section
  - Prior to demobilization or at substantial completion

- **Initial Punch List**
  - Include E&S, ADA, Safety, Bridge Management lists
  - List to Contractor within 7 days
  - Itemized for correction, location, financial responsibility

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The Primary Inspection for the referenced project will be scheduled upon completion of the following items of work:

1. Installation of All Construction Signs. (Contractor’s Responsibility)
2. Installation of All Roadway Striping. (Contractor’s Responsibility)
3. Remove all Sediment Bags from Inlets. (Contractor’s Responsibility)
4. Repair Chips in Sidewalk project wide. (Contractor’s Responsibility)
5. Clean concrete spatter from neighboring parcels, buildings, sidewalk, etc. (Contractor’s Responsibility)
6. Installation of Polymeric Sand in Brick project wide. (Contractor’s Responsibility)
7. Seal all cracks in concrete project wide. (Contractor’s Responsibility)
8. Seal around the Manhole/Valve Adjustments in roadway. (Contractor’s Responsibility)
9. Topsoil, Grass Seed and Erosion Control Blanket low spots, missed areas adjacent to sidewalk, etc. (Contractor’s Responsibility)
20. Install 5" solid white permanent pavement striping from STA 1+50, LT to STA 2+50, LT and from STA 102+50, LT to STA 103+15, LT in accordance with plan sheet 34. (Contract item to be paid under existing contract items)

21. Extend 5" solid white permanent pavement striping for bike lane to STA 106+80, LT in accordance with plan sheet 25. (Contract item to be paid under existing contract items)

22. A temporary stop bar was observed at STA 6+75, RT on Pennsylvania Ave that was not covered in full by the permanent striping. It must be removed in order for the permanent pavement markings to accurately reflect the intended roadway guidance. Removal of pavement markings shall be in accordance Section 817-03.9. Use shotcrete or blast equipment to remove pavement markings. After removal of striping on bituminous concrete, an approved flat black paint or asphalt sealant shall be used to cover any exposed aggregate or embedded paint. (Incidental to previously paid contract items)

24. An existing epoxy white line was observed at STA 104+15, RT on Southbound SR 1 that was not properly removed in full. It must be removed in order for the permanent pavement markings to accurately reflect the intended roadway guidance. Removal of pavement markings shall be in accordance with Section 817-03.9. Use shotcrete or blast equipment to remove pavement markings. After removal of striping on bituminous concrete, an approved flat black paint or asphalt sealant shall be used to cover any exposed aggregate or embedded paint. (Incidental to previously paid contract items)

23. A temporary stop bar was observed at STA 6+75, RT on Pennsylvania Ave that was not covered in full by the permanent striping. It must be removed in order for the permanent pavement markings to accurately reflect the intended roadway guidance. Removal of pavement markings shall be in accordance with Section 817-03.9. Use shotcrete or blast equipment to remove pavement markings. After removal of striping on bituminous concrete, an approved flat black paint or asphalt sealant shall be used to cover any exposed aggregate or embedded paint. (Incidental to previously paid contract items)

25a. STA 103+25, LT: One Way/Divided Highway Sign
25b. STA 107+35, LT: Type 3 Object Marker Sign

26. All sign posts need the breakaway feature to be within 1” to 4” from the top of grade and shall be equipped with corner bolts in accordance with Standard Construction Details T-15 (2013) sheet 1 of 1. The breakaway feature of the “North SR 1” sign at STA 106+20, LT was observed to be adjusted to the correct height. Check and correct all sign posts within the Limits of Construction to ensure that all comply with the Standard Construction Details to allow for the proper operation of the assembly in the event of a vehicular impact. (Incidental to previously paid contract items)
## Inspection Framework

### Initial Inspection List Annotation

1. Address all items on E&S Inspection Report dated July 15, 2020 or most current report. To be sent under separate cover. This work must be completed prior to acceptance. *(Incidental to previously paid contract item)*

2. Address all items on BMP 1013 Initial Inspection Report dated July 9, 2020. To be sent under separate cover. *(Incidental to previously paid contract item)*

3. Address all items on ADA Compliance Review Report & Measurements dated July 20, 2020. To be sent under separate cover. *(Incidental to previously paid contract item)*

### Example Table

<table>
<thead>
<tr>
<th>Date</th>
<th>SB</th>
<th>Location</th>
<th>Comments</th>
<th>Completed on</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/16/2020</td>
<td>SB</td>
<td>13:13:40</td>
<td>STA 104+40, RT existing, pork chop island</td>
<td>8/19/2020</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Countertop Non-Conforming (pavement/vertical difference in crosswalk). Vertical Difference Non-Conforming</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Hot mix patched in front of concrete.</td>
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</tbody>
</table>
Inspection Framework

**Primary Inspection**
- Administering Section with Engineering Support, M&O, Traffic, E&S, NPDES, Bridge, PM, Designer, etc.
- Meeting on site to identify items to be on the list, and list reviewed at end of inspection
- Administering Section generates list (7 days internal review, 14 days to contractor)

4. Seal cracks observed on the top of the pole base (PL/1) at approx. Sta 21+25 Left. (Contractor’s Expense)
5. Install the missing alkyl-thermoplastic pavement striping, white symbol/legend (Item 817002) at the North District DOTS Building entrance at Sta 22+25 Right shown on Sheet 20 of the plan set. (Contract Pay Item)
6. Install delineator(s) on the leading ends / corners of the islands. (Incidental to Pay Item 702000)
7. Grade to a maximum of 6:1, apply topsoil, seed, and blanket a minimum of 2’ behind the sidewalk at approx. Sta 22+75 Right to Sta 23+20 Right. (Contractor’s Expense)
8. Patch the top of the pole base (PL/3) to match the grades at the edge of sidewalk at approx. Sta 22+82 Right. (Contractor’s Expense)
Inspection Framework

- Primary Inspection Report
  - Engineering Support generates for Departmental documentation, education, and best practice development
  - Highlight specifications and details pertaining to items
Inspection Framework

- Monthly Inspection Meetings
  - Highlight items for discussion from reports issued in the prior month
  - Monthly Inspection Report attempt to highlight items by category (Construction, Design, ADA, Bridge, E&S, Traffic, etc.)
Inspection Framework

- Acceptance
  - The Administering Section notifies District Engineer and Maintenance Engineer that ALL Primary Punchlist items are addressed
  - Maintenance to verify all items are addressed within 30 calendar days
  - Maintenance to accept

4. Backfill around ET approximate Sta: 52+40. Cold patch any voids in maintenance strip between Sta: 44+75 Rt to 53+00 Rt. Dupont Road. Areas between Sta: 44+75 to 52+40 Rt Dupont Road. (Incidental to contract) North of 52+40 T&M. Completed 8/3/20

5. Trim tree above sidewalk Sta: 52+50 RT. Currently a branch is hanging below the required 8’ clearance height. (Incidental to contract) Completed 8/10/20


7. Permanent Signs breakaway sleeves not at proper elevation at the following locations: sign 3A Sta: 51+25 Lt and Stop Sign at intersection of Boulevard Road/Eastwood Road. (Incidental to contract) Completed 8/3/20

8. Fill in expansion dam vent holes at North and South Abutment. (Incidental to contract) Completed 8/4/20

MEMORANDUM

TO: Anne Ross, Director, Maintenance and Operations

VIA: Llano Rios, North District Engineer

FROM: Chris Combs, Group I Construction Engineer

DATE: January 25, 2021

SUBJECT: Contract No. TSM767661, BR 1445 89 BR on Dupont Road over East Pass Boulevard, P.O. Box 593052, St. Louis, MO 63159-0001

The referenced project has been completed in reasonable conformance with the applicable plans and specifications. All items identified during the ADA Inspection and Final Inspection have been completed.

Unless acceptance of the project by the Department of Transportation can now be made, the attached Acceptance Letter has been prepared for signature by the Director of Maintenance and Operations. The Acceptance Letter must be signed within 30 days of the date of this memo. Any outstanding items/invoices in the construction of the project may be noted so that the Acceptance Letter can be signed.

Additionally, it is noted that the following items (if found) were included as part of the construction of this project:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape/Planting</td>
<td></td>
<td></td>
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<tr>
<td>Highway Lighting</td>
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Inspection Framework Evaluation

Next Steps
- Evaluate data pertaining to timeframes
- Obtain observational feedback from users
- Collaborate and make any necessary changes
- Update Specifications
Inspection Framework Evaluation

Data Points to be investigated
- # Primary Inspections (Total)
- # Initial Inspections with M&O in Attendance
- # days between initial and punch list to contractor
- # Annotated punch lists submitted with Primary Request
- # days between request and Primary Inspection
- # days Draft Primary punch list for review to inspection team
- # days Primary punch list to contractor
- # days for contractor to resolve punch list items
- # days between notice of primary punch list completion to signed acceptance letter
Initial Observational Feedback

What are the biggest challenges you see with the framework? (CONSTRUCTION RESPONSES)

- “Getting the walk through for initial inspection (Construction/Maintenance and Contractor) and ADA notes to be able to get the primary inspection done.”

- “Still rare that the initial occurs before substantial completion/demobilization, how can we catch everything on the initial list if not all the work is complete?”

- “Timeframe for getting the initial list out (7 calendar days) is hard to meet because the initial lists are longer.”

- “Not getting everyone’s items in advance of the Primary for those who can’t make it.”

- “Terminology does not match Section 105.16 of the 2020 Standard Specifications, this framework should meet our contractual obligations.”
Initial Observational Feedback

What are the biggest challenges you see with the framework? (MAINT., DCA, ENG SUPPORT)

- “The long wait times for the walks because of staffing or scheduling conflicts throughout the district...has gotten better.”

- “Getting the inspections done timely and including all parties – preferably before the contractor demobes.”
Initial Observational Feedback

- **What works well under this framework? (CONSTRUCTION)**
  - “The documentation of this specific framework and timeframes helps to improve consistency and expectations of involved parties.”
  
  “The acceptance process seems to be working a lot faster. I like annotating the list with a date the item was addressed. Also scheduling the Primary doesn’t seem to take as long as it use to. It used to be months before we could get a final inspection on date on the calendar.”
Initial Observational Feedback

What works well under this framework? (MAINTENANCE, DCA, ENG SUPPORT)

- “The ability to discuss different issues that come up in the field during the walk through inspections; item and situations that’s not really on the approved plan set that was either overlooked through design or planning that was required or in some cases not.”

- “When the timing is early and all parties represented, it is much more efficient.”

- “It helps hold people accountable and keeps everyone on the same page. It’s easier for others to follow-up and check things off in theory if people are being honest about what’s completed on the lists.”
Initial Observational Feedback

▪ **What parts of the framework need improvement? (CONSTRUCTION)**

▪ “There are still going to be things that all those sections find at the primary that we didn’t find at the initial. I think more sections need to be made to attend the initial. Also most people never write back to the draft primary list. Maybe add language that they have 3 days to review the draft and after 3 days they lose their right to any further comments.”

▪ “Addition of the Designer/EOR at the initial inspection. I performed several initial inspections this past year and it was evident that the presence of the Designer/EOR would have streamlined addressing identified issues. One example was when significant stream erosion was observed during the initial inspection which resulted in a separate field meeting with the EOR to discuss acceptable solutions. Ultimately, a plan revision had to be issued.”

▪ “Because comments regarding deficiencies in E&S and Safety are expected during the initial inspection punch list, it might be beneficial to include E&S and Traffic as attending sections during the initial inspection.”

▪ “Include the time the Contractor has to correct the initial punch list as outlined in Section 105.16.2.b.”
Initial Observational Feedback

- **What parts of the framework need improvement? (MAINTENANCE, DCA, ENG SUPPORT)**
  - “Decrease timeframes (i.e. get official punch list from initial inspection back faster). Schedule primary as soon as possible.”

  - “Make it mandatory for ADA inspection to occur before Initial Inspection while crews are still at jobsite.”
Initial Observational Feedback

- General comments on the framework? (CONSTRUCTION)

  “I like the new framework. But I would request we go back to the naming convention of Semi-Final and Final it is more standard.”

  “Overall, I like the new process a lot. I’m thankful for it because it provides consistency among all of DelDOT.”
Initial Observational Feedback

- **General comments on the framework? (MAINTENANCE, DCA, ENG SUPPORT)**
  - “At Acceptance, Construction has been providing the date punch list work (ADA & Inspection) was completed but also providing pictures of the repairs. This has been a huge help to allow M&O to sign off right away because we don’t need to send one of our inspectors out to review the punch list work. Just because there is a date of remedial work doesn’t mean it was actually done. We’ve found many inspectors just slap dates on repairs but the repairs have not been done once they come to our desk for acceptance.”
  - “New system works.”
  - “The one aspect I believe should be re-considered is the terminology. The Initial and Primary terminology is noted as intentional due to the new process. I don’t see this as new process rather than a detailed clarification of how we should be conducting inspections.”
Primary Inspections

- Engineering Support generates Primary Inspection Report
  - Departmental documentation
  - Education
  - Best practice/process development
  - Detail/Specification evaluation

- Findings are based on the finished product
  - Ask questions to start a dialog.
  - We can only see what is on top.
  - Assist the Administering Section in making sure we get the product specified in contract documents
Pavement
Pavement

- Open Joints
  - Water intrusion
  - Butt Joints require sealing

Snapshot taken from Standard No. P-3 (2014), SHT 1 of 1, of the Standard Details
Pavement

- Open Joints
  - Water intrusion
  - Sealing around patches for curbing, drainage inlets, manholes, utilities, etc.
Pavement

- 1/4" Pavement Tolerance

N. **Surface Tolerances.** Maximum deviation both longitudinal and transverse is 1/4 inch in 10 feet. Correct or remove areas exceeding these tolerances at no expense to the Department.

401.05 Basis of Payment:

Payment will be for the accepted quantity of bituminous pavement Materials at the Contract Unit Price per ton for furnishing, preparing, hauling, and placing all Materials, including tack coat and safety edge; for removing Material from around manholes, drainage inlets, valves, and similar features; for removing and replacing excess asphalt cement; and for all labor, Equipment, tools, and incidentals required to complete the Work.

*Snapshot taken from 2016 Standard Specifications, Section 401.04 and 401.05*
Pavement

- Pop outs
  - Fix to prevent water intrusion
  - Prevent premature deterioration
- Tackifier coverage

Snapshot taken from Section 401.15 of the Standard Specifications
Pavement

- Utility lids/manholes covered with material
Pavement

- **Rumble strips**
  - Did they exist prior to project?
  - Design – scope existing conditions, verify no change at PSE

- **Raised Pavement Markers (RPMs)**
  - Included in contract bid items?
  - Lens colors/orientation
Signs

- Breakaway sleeves
- Breakaway height 1”-4”
- 90 degree bolt installation
- Pin double sign blades
Vegetative Stabilization/Grading
Vegetative Stabilization/Grading

- Backfill any settlement, rills, washouts, voids
- Adequate vegetation coverage
Vegetative Stabilization/Grading

- Blanket/mulch must be identified on the Approved Product List for use.
- Photodegradable products are not acceptable.

D. Erosion Control and Mulching Products:

1. Rolled Erosion Control Products. Select from the Approved Products List [link to PDF](https://www.deldot.gov/Business/prodlists/pdfs/soil/approved_product_list Rolled_erosion_control_products.pdf?1032018) for the location and type of blanket (ECB, TRM Type 1, or TRM Type 2) designated on the Plans. Photodegradable products are not acceptable.

Snapshot taken from the 2016 Standard Specifications, Section 908.02.D (Rev. 12/28/2018)
Vegetative Stabilization/Grading

- Structure height shall not exceed 4” above grade (lighting base, sign base, etc.)
- Utility Valves, junction wells, etc. to be flush with grade
Vegetative Stabilization/Grading

- Key in/secure geotextile (riprap)


**708.03 Construction.** Place the geotextile on a prepared suitable base area in a loose unstretched condition to minimize tearing and shifting. Join the adjacent edges of the fabric with a lock-type or chain-type stitch folded seam or overlap adjacent swaths of fabric a minimum of 12 inches, if permitted. The overlap direction shall be upstream over downstream and upslope over downslope. Anchor the fabric in place using securing pins or other acceptable methods. Cover the fabric as soon as possible so that it is not exposed for more than two weeks.

Snapshot taken from the 2018 Standard Specifications, Section 708.03
Vegetative Stabilization/Grading

- Remove any sediment/vegetation buildup that impedes flow
Pipes

- Recommended lift holes in structures be parged
- Recommended exposed rebar parged or epoxy
- Safety grates and locks
Drainage Inlets

- Pipes are to be mortared and flush with the wall

5. Ensure inlet and outlet pipes are the same size and type as the connecting pipes shown in the Contract Documents and that pipes extend through the walls and are flush with the inside of the wall. When the end of a reinforced concrete pipe is cut off, ensure that the end is cut clean and smoothly finished with mortar so that no bar reinforcement 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 5000 pounds per square inch. Ensure that the greatest dimension of the opening in the drainage inlet for the pipe is no greater than the outside pipe diameter plus 4 inches.

*Snapshot taken from Section 602.03 of the Standard Specification (2016)*
Drainage Inlets

- Steps installed when required
  - First step located 24” max from grate top
  - Top slab or 4 feet in depth from top of grate to invert of lowest pipe

4. Install steps on the backwall for all drainage inlets and manholes, and junction boxes that utilize a removable top slab, as specified in the Contract Documents. Ensure 6 inches of embedment from the top of grate or cover to invert of the lowest pipe. Provide minimum embedment of 3 inches in the wall and ensure that the steps protrude out 6 inches from the wall. Begin steps within 24 inches of the top of grate lid and end steps no more than 12 inches above the lowest invert except where a pipe is in the backwall. Space steps vertically at 12 inch intervals.

Snapshot taken from Section 602.03 of the Standard Specification (2016)
Drainage Inlets

- Flow channel installation

Snapshots taken from Standard No. D-4(2009) Sheet 1 of 1, of the Standard Construction Details
Drainage Inlets

- Formwork/foam to be removed
- Parging for “honey combing”, around pipe entry, frame adjustments
- Grate types
Drainage Inlets

- Grate orientation
PCC Curb, Sidewalk, Islands
PCC Curbs

- Gutter Flow/Drainage (Design)
  - Gutter to better manage and direct flows
  - Verify outfall within project scoping, check for highpoints just beyond tie-in location
  - Does typical section (adjacent grading) prevent roadway from draining?
  - “Maintain/Ensure Positive Drainage” vs. “Match Existing Pavement or Curb Elevations”
  - Entrance or driveways may require additional consideration/information to maintain gutter flow/conveyance
  - Pedestrian connections and drainage structures

1. UNLESS OTHERWISE NOTED, POINT GEOMETRY ADJACENT TO CURB IS GIVEN TO THE EDGE OF PAVEMENT.

2. RADAR ARE GIVEN TO THE EDGE OF PAVEMENT.

3. THE CONTRACTOR SHALL STAKE ALL GRADES TO ENSURE POSITIVE DRAINAGE AND ADA CONFORMANCE PRIOR TO CONSTRUCTION. ALL GRADES MUST BE APPROVED BY THE ENGINEER IN THE FIELD PRIOR TO CONSTRUCTION. ALL WORK REQUIRED FOR THE CALCULATING AND STAKING OF GRADES SHALL BE PAID FOR UNDER ITEM 76.3501 - CONSTRUCTION ENGINEERING.

4. PROPOSED CURBS OR PAVEMENT THAT TIE INTO EXISTING PAVEMENT OR CURB SHALL MATCH THE EXISTING PAVEMENT OR CURB ELEVATIONS. THE INTENT IS TO MEET EXISTING ROAD ELEVATIONS.
Sidewalk/Curb

- Cut joints where spacing exceeds maximum
- Provide 2’ @ 6:1 slope adjacent to Sidewalk/SUP
  - Consider specifying 6:1 slope on typical sections when R/W permits
PCC Islands

- Depress Median/Channelizing Island leading edges/noses
  - No signs within this 10’ taper

- Tubular Markers on channelizing islands
Bridge

- Bridge Painting

Example:
BR 1-001
MAR 2013

Snapshot taken from the 2016 Standard Specifications, Section 616.01.08
Guardrail

- Tighten all hardware (bolts, swaged cable, offset blocks)
- Bearing plate orientation and secured
Guardrail

- End Treatment Grading
  - Ensure adequate R/W
  - How does this affect proposed drainage?
  - 10:1 slope per the detail
Guardrail

Delineator Panel

**Delineator Panel Attachment**

Installation of the front delineation plate will be determined by the location of the attenuator and state regulations. A delineation plate is shipped with a yellow powder coat background and no striping. It is attached with four bolts. Applying the striping to the plate is easier while it is removed from the attenuator. Examples of the delineation plate are as follows:

- **Right Shoulder**
- **Chevron for Medians**
- **Left Shoulder**
Guardrail

- Offset/Clearance distance from back of post
- Curb Opening Considerations
  - Leave Outs
  - Guardrail with omitted post
  - Layout based on guardrail spacing (Type 1-31 = 6’3”)

![Diagram of guardrail placement and layout based on guardrail spacing]

**Type 1-31 Guardrail Placement**
- Post spacing 6’-3”
- Required clearance 4’-0” min from back of post

**Plan View**
- PCC curb flush with face of guardrail, per detail 9-1 sheet 9-D-5’s

**Elevation View**
- Area of omitted post
- First post able to be omitted (after end post downstream from PAV limits)

**Omitted Post with a Type 1-31 Guardrail End Terminal**
Guardrail

- Pavement overlay and Guardrail Height
Pavement Markings
Pavement Marking Considerations

- Consider proposed improvement impacts on existing striping
Pavement Marking Removal

- Asphalt Sealer or black paint over striping removal
Traffic Equipment

- Electric Service Pedestals
ADA/Pedestrian/Bicycle

- Vertical Differences

3.3.2 PAR Vertical Surface Discontinuities

Vertical surface discontinuities between adjacent surfaces shall be beveled where greater than 1/4 inch. Vertical surface discontinuities between 1/4 inch and 1/2 inch shall be beveled with a slope not steeper than 20:1 (0.05%) as illustrated in Figure 3.3.2. Where a vertical difference of 1/2 inch or less is impractical, the surface discontinuity shall be sloped no steeper than 120:1 (0.33%). The transition between the depressed curb at a blended transition or ramp segment and gutter must meet the requirements of Section 38.7.8. Beveling shall be applied across the entire limits of the vertical surface discontinuity.

Snapshots taken from, Section 3.3.2, the 2018 Pedestrian Accessibility Standards (PAS)
ADA/Pedestrian/Bicycle

- Consideration for accessibility/turning space
ADA/Pedestrian/Bicycle

- Protrusions and Vertical Clearance
  - Vegetation
  - Guy Wires
  - Utilities
  - Signs

3.7.4 Protruding Objects

Objects mounted on fixed structures where the objects’ leading edges protrude into the PCP above the cane detectable range and below the required Vertical Clearance (for example protruding edge occurs between 27 inches and 80 inches above the pedestrian facility’s surface) shall meet the Minimum Standard of 4 inches maximum protrusion, measured from the face of the fixed structure into the PCP. (See protruding objects mounted on fixed structures in Figure 3.2, Figure 3.7.4 and Figure 3.8.6-a.)

PAR Minimum Standards along a SUP require that no overhanging or protruding objects impact any portion of a shared use path at or below 96 inches. At the time of final inspection for SUP facilities, the Minimum Standard is 120 inches for overhanging vegetation such as tree limbs to allow for future growth.

Snapshot taken from Section 3.7.4 of the DelDOT PAS Manual (2018)

3.7.6 Post-Mounted Objects

Signs mounted on posts or pylons with leading edges that protrude at a height above the cane detectable range (more than 27 inches above the PCP surface and below the required vertical clearance) cannot protrude more than 4 inches out into the PCP per the DE MUTCD. The

Snapshot taken from Figure 3.7.6 of the DelDOT PAS Manual (2018)
ADA/Pedestrian/Bicycle

- **DWS Placement**
  - DWS shall extend the full width of curb ramp and fully depressed curb.

*Snapshot taken from 2018 PAS, Section 3.9.3*
ADA/Pedestrian/Bicycle

- DWS Placement
  - Consideration with parallel on-road bicycle facility/bike lane
  - Directional Tactile Surface indicator (DTSI) – DGM 1-28
    - Located on approach/exit of the bike ramp
    - Run parallel to the pedestrian route of travel to identify to the pedestrian the continued direction of travel
Thank you!

John Caruano

DelDOT Support Engineer

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