MOT Session

FTBA Construction Conference

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Construction and Design Offices
MOT Session

Agenda

1) FHWA Focused Inspections
2) Specification Updates
3) Standard Plans Updates
   a. General Information
   b. Temporary Traffic Control
   c. Pavement Markings
4) 2018 Process Review Findings
5) Current and Future Research
FHWA Focused Inspection

- FHWA conducted 2 focused inspections on temporary barrier wall and crash cushion
  - Randomly selected
  - Representing all Districts, excluding Turnpike
  - Found widespread QA/QC issues on product installation and acceptance methods
## FHWA Focused Inspection

<table>
<thead>
<tr>
<th>Issue</th>
<th>2018</th>
<th>2015</th>
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</thead>
<tbody>
<tr>
<td>Crash Cushion – Loose Bolts</td>
<td>57%</td>
<td>45%</td>
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<tr>
<td>Crash Cushion – Unlevel Cartridges</td>
<td>35%</td>
<td>24%</td>
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<tr>
<td>Barrier Walls – Deflection Space, Debris &amp; Obstructions</td>
<td>20%</td>
<td>28%</td>
</tr>
<tr>
<td>Barrier Walls – Damage (Spalling, Exposed re-bar, etc)</td>
<td>20%</td>
<td>28%</td>
</tr>
</tbody>
</table>
FHWA Focused Inspection

• FDOT response
  – Distribute report findings to Districts
  – DCE Memo 16-18 issued in June 2018
  – Focused Inspections of temporary barriers and crash cushions
  – Promotion of new training materials
    • Temporary Barrier Inspection Training
    • Crash Cushion Inspection Training

http://www.fdot.gov/construction/Engineers/MOT/MOTMain.shtm
Proposed Specification Changes

• Changes to 102
  • Temporary Barrier Wall Repair
    • Developed FDOT Evaluation Guide – Temporary Concrete Barrier
      – Objective Acceptable vs. Unacceptable criteria
    • Added new Subarticle
      – 102-9.6.2.4 Temporary Concrete Barrier Repair
  • To be implemented via DCE Memo for all current and future projects
ACCEPTABLE

Temporary Concrete Barrier exhibiting the following conditions is considered Acceptable:

1. The barrier is completely intact and has only minor blemishes or imperfections, which may include superficial gouges or minor cracks. The barrier has no structural cracks or cracks that exist through the entire cross-section.

2. Minor spalls with a depth of 1.5 inches or less, and no exposed rebar (excluding anchor slots).

3. The unit-to-unit connection assemblies are functional with no damage, are all intact, and fixed in their positions.

4. Temporary Concrete Barrier previously repaired in accordance with Specification 102.
UNACCEPTABLE
Temporary concrete barrier exhibiting any of the following conditions is considered unacceptable and must be repaired or replaced in accordance with Specification 102.

1. The barrier has multiple cracks throughout, structural cracks or cracks through the entire cross-section.
2. Spalls with a depth greater than 1.5 inches; any location with exposed rebar or rebar protruding from the barrier (excluding anchor slots); or bolts protruding from the barrier face.
3. Cracked or broken concrete that could easily be dislodged if hit, resulting in either of the two conditions above.
4. Anchored barrier with broken concrete with shear cracks.
5. The unit-to-unit connection assemblies are deformed, bent, broken, or no longer in a fixed position.
102-9 Temporary Traffic Control Devices.

102-9.1 Installation and Maintenance: ...Maintain temporary traffic control devices in the correct position, properly oriented, clearly visible and clean, at all times. All applicable temporary traffic control devices must meet the classification category of Acceptable as defined in the American Traffic Safety Services Association (ATSSA) Quality Guidelines for Temporary Traffic Control Devices and Features. Temporary concrete barriers must meet the classification category of Acceptable as defined in the Department’s Temporary Concrete Barrier Evaluation Guide, which may be viewed at the following URL: http://www.fdot.gov/programmanagement/Implemented/URLinSpecs/files/TemporaryConcreteBarrierGuide.pdf. Pedestrian longitudinal...
102-9.6.2.4 Temporary Concrete Barrier Repair: Before beginning the repair, remove all laitance, loose material, and any other deleterious matter to sound concrete or a minimum depth of 1 inch. Additionally, when reinforcing bars, inserts or weldments are exposed, remove the concrete to provide a minimum 1 inch clearance all around. Fill the repair area with an approved high performance concrete repair material in accordance with Subarticle 930-5 and the manufacturer’s recommendations. Restore surfaces and edges to the original dimensions and shape of the barrier.

Repairs are not allowed on barrier units that have one or more of the following deficiencies: structural cracking or cracks that exist through the entire cross-section; unit-to-unit connection assemblies or anchor slots are broken or no longer in a fixed position.

Do not paint repaired barriers.
SECTION 522 is expanded by the following new Article:

522-9 Opening Sidewalk to Pedestrian Traffic.

*Install detectable warnings, when shown in the Plans, in accordance with Section 527 on completed sections of sidewalk before opening to pedestrian traffic.*

522-10 Method of Measurement.

The quantity to be paid will be plan quantity, in square yards, completed and accepted. Ramps, reconstructed sidewalks, walk around sidewalks, sidewalk landings, sidewalk curb, and driveways will be included in the area to be paid.

522-11 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. Excavation for new installations will be paid for under the items for the grading work on the project.

Payment will be made under:

Item No. 522- Concrete Sidewalks and Driveways- per square yard.
SUBARTICLE 527-3.1 is deleted and the following substituted:

527-3 Installation Procedures.

527-3.1 Surface Preparation and Installation: Prepare the surface in accordance with the manufacturer’s recommendations. Use only products and materials appropriate for the surface on which they will be applied. Install in accordance with the manufacturer’s instructions, using materials and equipment recommended and approved by the manufacturer. *Install surface-applied tiles or mats as soon as the sidewalk concrete has cured and before opening to pedestrian traffic using* For surface-applied tiles or mats, use adhesives applied over the entire surface and mechanical fasteners.
ARTICLE 7-15 is deleted and the following substituted:

7-15 Opening Sections of the Work Highway to Traffic.

Whenever any bridge or section of the Work roadway is in acceptable condition for use travel, the Engineer may direct the Contractor to open it to vehicular or pedestrian traffic. The Department’s direction to open a bridge or section of the Work roadway does not constitute an acceptance of the Work bridge or roadway, or any part thereof, or waive any Contract provisions. Perform all necessary repairs or renewals, on any section of the Work roadway or bridge thus opened to traffic under direction instructions from the Engineer, due to defective material or work or to any cause other than ordinary wear and tear, pending completion and the Engineer’s acceptance of the roadway or bridge, or other Work, at no expense to the Department.
ARTICLE 102-4 is deleted and the following substituted:

102-4 Alternative Traffic Control Plan.

The Contractor may propose an alternative traffic control plan (TCP) to the plan presented in the Contract Documents. The Contractor’s Engineer of Record must sign and seal the alternative plan and submit to the Engineer. Prepare the TCP in conformance with and in the form outlined in the current version of the FDOT Design Manual. Indicate in the plan a TCP for each phase of activities. Take responsibility for identifying and assessing any potential impacts to a utility that may be caused by the alternate TCP proposed by the Contractor, and notify the Department in writing of any such potential impacts to utilities.

For projects with nighttime lane closure restrictions where paving is expected to extend into the winter months, the Contractor may propose an alternative TCP allowing for daytime lane closures for friction course paving. The alternative TCP must be a lane closure analysis based on actual traffic counts and prepared in accordance with the FDOT Design Manual.

Engineer’s approval of the alternate TCP does not relieve the Contractor of sole responsibility for all utility impacts, costs, delays or damages, whether direct or indirect, ...
SUBARTICLE 102-6.1 is deleted and the following substituted:

102-6.1 General: Construct and maintain detour facilities wherever it becomes necessary to divert traffic, including pedestrians and bicyclists, from any existing roadway or bridge facility, or wherever construction operations block the flow of traffic.

ARTICLE 102-6 is expanded by the following:

102-6.8 Pedestrian Special Detour: A pedestrian special detour is defined as a temporary pedestrian way that requires temporary pavement or other stable, firm, slip-resistant surface.

ARTICLE 102-11 is expanded by the following:

102-11.25 Pedestrian Special Detours: When a pedestrian special detour is shown in the Plans, the work of constructing, maintaining, and subsequently removing such detour facilities will be paid for under Pedestrian Special Detour, lump sum. However, traffic control devices, warning devices, barriers, signing, pavement markings, and restoration to final configuration will be paid for under their respective pay items.
ARTICLE 102-13 is deleted and the following substituted:

102-13 Basis of Payment.

...102-13.24 Pedestrian Special Detours: Price and payment will be full compensation for providing all pedestrian special detour shown in the Plans.

102-13.24 Payment Items: Payment will be made under:
Item No. 102- 1- Maintenance of Traffic - lump sum.
Item No. 102- 2- Special Detour - lump sum.
Item No. 102- 3- Commercial Material for Driveway Maintenance - per cubic yard.
Item No. 102- 4- Pedestrian Special Detour - lump sum.
Item No. 102- 14- Traffic Control Officer - per hour.
Item No. 102- 30- Temporary Highway Lighting - lump sum.
Item No. 102- 60- Work Zone Sign - per each per day.
Item No. 102- 61- Business Sign - each.
Item No. 102- 62- Barrier Mounted Work Zone Sign – per each per day
Item No. 102- 71- Temporary Barrier - per foot.

For additional information, refer to Roadway Design Memorandum 19-01.
SUBARTICLES 102-9.11 thru 102-9.14 are deleted and the following substituted:

102-9.11 Arrow Board: Furnish arrow boards that meet the requirements of Section 990 as required by the Plans and Standard Plans to advise approaching traffic of lane closures or shoulder work. Ensure that the arrow board display panel is raised to a minimum mounting height of 7 feet from the bottom of the panel to the edge of the travel way elevation when in the **fully upright position** and is **fully visible to motorists**. Type B arrow boards may be used on low to intermediate speed (0 mph to 50 mph) facilities or for maintenance or moving operations on any speed facility. Type C arrow boards must be used for all other operations on high-speed (50 mph and greater) facilities and may be substituted for Type B arrow boards on any speed facility.

102-9.12 Portable Changeable Message Sign (PCMS): Furnish PCMSs or truck mounted changeable message signs that meet the requirements of Section 990 as required by the Plans and Standard Plans to supplement other temporary traffic control devices used in work zones. Ensure that the PCMS display panel is raised to a minimum mounting height of 7 feet from the bottom of the panel to the edge of the travel way elevation when in the **fully upright position** and is **fully visible to motorists**. Messages must have a maximum of two phases. The display time for each phase must be at least two seconds but no more than three seconds. The sum of the display time must be a maximum of six seconds.
SUBARTICLES 102-9.11 thru 102-9.14 are deleted and the following substituted:

102-9.13 Portable Regulatory Signs (PRS): Furnish PRSs that meet the requirements of Section 990 as required by the Plans and Standard Plans. Ensure that the PRS sign panel is raised to a fully upright position and is fully visible to motorists to a minimum mounting height of 7 feet from the bottom of the panel to the edge of the travel way elevation when in the upright position.

Activate portable regulatory signs only during active work activities and deactivate when no work is being performed.

102-9.14 Radar Speed Display Unit (RSDU): Furnish RSDUs that meet the requirements of Section 990 as required by the Plans and Standard Plans to inform motorists of the posted speed and their actual speed. Ensure that the RSDU display panel is raised to a minimum mounting height of 5 feet from the bottom of the panel to the edge of the travel way elevation when in the upright position mounted in accordance with the manufacturer’s recommendations.

Activate the radar speed display unit only during active work activities and deactivate when no work is being performed.
SUBARTICLE 102-3.3 is deleted and the following substituted:

102-3.3 Lane Closure Information System: Approval for all lane closures, mobile operations, and traffic pacing operations is required. Submit routine requests to the Engineer fourteen calendar days in advance of planned lane closures, mobile operations, and traffic pacing operations at the following URL address: https://lcis.dot.state.fl.us/. Confirm at least once every two weeks that information entered within LCIS reflects current planned operations and update as necessary. For unforeseen events that require cancelling or rescheduling lane closures, mobile operations, and traffic pacing operations, revise the lane closure request as soon as possible.

For additional information, please refer to DCE Memo 20-18.
ARTICLE 102-11 is expanded by the following:

102-11.24 Temporary Highway Lighting: When temporary highway lighting is required by the Plans, the work of constructing, maintaining, and removing the temporary highway lighting, including all materials and any necessary design work, will be paid for under Temporary Highway Lighting, lump sum.

ARTICLE 102-13 is deleted and the following substituted:

102-13.23 Temporary Highway Lighting: Price and payment will be full compensation for providing all temporary highway lighting shown in the Plans.

102-13.24 Payment Items: Payment will be made under:

Item No. 102-1- Maintenance of Traffic - lump sum.
Item No. 102-2- Special Detour - lump sum.
Item No. 102-3- Commercial Material for Driveway Maintenance - per cubic yard.
Item No. 102-14- Traffic Control Officer - per hour.
Item No. 102-30- Temporary Highway Lighting - lump sum.
SUBARTICLE 990-2.1.1 is deleted and the following substituted:

990-2.1.1 Sign Panels, Bands for Tubular Markers, Vertical Panels, Barricades, **Vehicular** Longitudinal Channelizing Devices, and other Devices: Sign panels, bands for tubular markers, vertical panels, barricades, **vehicular** longitudinal channelizing devices, and other devices shall meet the requirements of ASTM D4956 for Type III or higher retroreflective sheeting materials identified in Section 994 except for mesh signs shall meet the color, daytime luminance and nonreflective property requirements of Section 994, Type VI.
MOT Session – Standard Plans Updates

General Information

http://www.fdot.gov/design/standardplans/
MOT Session – Standard Plans Updates

General Information

http://www.fdot.gov/design/standardplans/
### General Information

See the FDOT Design Manual (FDM), Chapter 115, for additional information on the use of Standard Plans within FDOT Contract Plans.

**Standard Plans for Road Construction**

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<th>Standard Plans Index</th>
<th>Interim Revision or Errata</th>
<th>Index Title</th>
<th>Design Standards Index</th>
<th>Standard Plans Instructions</th>
<th>Design Tools</th>
<th>Contact</th>
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**Support Detail**

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*Last updated: 11/02/2018*

http://www.fdot.gov/design/standardplans/
## General Information

### STANDARD PLANS
**FY 2019-20 REVISIONS LOG**

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<th>Standard Plans Index</th>
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<tr>
<td>000-506</td>
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</table>
| 000-510              | All Sheets: Changed Title.  
Sheet 1: Deleted "DESIGN SPEED" table and "RADIUS OF CURVE" table; Deleted subtitle.  
Sheet 2: Added Concrete Pavement note to clarify shoulder slope transitions. |
| 000-511              | All Sheets: Changed Title, Subtitles, and Renumbered.  
Sheet 1: Deleted Superelevations Rates Tabulated and Charted Values (information can be found in FDM); combined General Notes with Old Sheet 2; Deleted all callouts for "CHARTED VALUES" on Old Sheet 2.  
Sheet 2: Updated Subtitle. |
| 000-515              | Deleted Index, Criteria information moved to New FDM Chapter 214. Construction details moved to New Indexes 522-003 or 330-001. |
| 000-516              | Deleted Index and moved information to Index 330-001. |
| 102-200              | Sheet 1: "STORAGE FACILITY" Note; Changed phone number to 407-278-2727. |
| 102-600              | Sheet 3: Updated "LENGTH OF LANE CLOSURES" Note.  
Sheet 9: Changed "DROP-OFF CONDITION NOTES" Note 5. |
| 102-655              | Sheet 1: Changed Notes to remove limitations to Limited Access Facilities and Overhead work.  
Clarified "TRAFFIC PACING GUIDE" notes for the requirements of site specific traffic control plans. Added Note 6 to the "TRAFFIC PACING GENERAL NOTES" for short duration operations. |
**MOT Session – Standard Plans Updates**

Index 102-600: General Information for Traffic Control Through Work Zones  
Sheet 3 of 12

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**CLEAR ZONE WIDTHS FOR WORK ZONES**

<table>
<thead>
<tr>
<th>WORK ZONE</th>
<th>LANE WIDTHS</th>
<th>MINIMUM WIDTHS</th>
</tr>
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<tbody>
<tr>
<td>Short</td>
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<tr>
<td>Med. &amp; Long</td>
<td>7 ft.</td>
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</tbody>
</table>

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**OVERWEIGHT/OVERSIZE VEHICLES**

- For high-speed facilities, maximum lane closure lengths will be three miles.
- The maximum lane closure length for high-speed facilities will be two miles.

---

**LANE WIDTHS**

- Lanes on high-speed facilities should be increased to a minimum of 12 ft.
- For high-speed facilities, the minimum lane width should be increased to 11 ft.

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**HIGH VISIBILITY SAFETY APPAREL**

- Minimum visibility safety apparel requirements include:
  - High-visibility safety apparel
  - Reflective safety apparel

---

**REGULATORY SPEEDS IN WORK ZONES**

- Maximum lane width for high-speed facilities should be three miles.
- The maximum lane closure length for high-speed facilities should be two miles.

---

**LENGTH OF LANE CLOSURES**

- Maximum lane closure length for high-speed facilities should be three miles.
- Maximum lane closure length for high-speed facilities should be two miles.

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*Florida Department of Transportation*
MOT Session – Standard Plans Updates

Index 102-655: Traffic Pacing

TRAFFIC PACING GUIDE
Traffic pacing is a traffic control technique to allow but not stop traffic to facilitate short duration work operations without an elaborate and difficult setup or diversion. Traffic control officers pace or slow the traffic to a speed that permits approximately 20–30 minutes to perform the work operation. The Department has frequently used this technique for setting bridge beams, overhead sign structures, and installing overhead sign supports.

NOTICE
This Index represents the minimum requirements for traffic pacing operations on the State Highway System. Develop a site-specific traffic control plan for each pacing operation location.

TRAFFIC PACING GENERAL NOTES
1. Variable AHEAD CLOSED (VAC) signs approximately 1000 ft. prior to the work area. These signs shall remain uncovered until the pacing operation begins and covered when the pacing operation has ended.
2. Prior to requesting that the traffic control officer supervise the pacing operation, the contractor shall ensure that the necessary equipment is properly positioned off the roadway for the construction activity requiring the traffic pacing operation.
3. Truck-mounted attenuators with changeable message signs are required to protect workers and/or equipment positioning in a travel lane at the work area during the pacing operation from an oncoming vehicle. If no workers and/or equipment are positioned in a travel lane at the work area, truck-mounted attenuators are not required.
4. A traffic control officer supervisor shall be stationed at the work area continuously throughout the pacing operation to ensure communication between the contractor and the project administrator, and all the persons involved in the pacing operation.
5. When more than one pacing operation is requested in one work period, the contractor shall allow sufficient time between pacing operations to ensure accessibility and allow additional time to be requested in the pacing operations to allow traffic to return to normal speed. The operations of the pacing should be documented to the project administrator or traffic control officer supervisor.
6. For work durations of less than five minutes, coordinate with traffic control officer to provide necessary for pacing traffic Portable changeable message signs, truck-mounted attenuators, and road closed signs, and site-specific traffic control plans if required for such operations. Use traffic pacing distance tables from the Traffic Pacing Distance Tables in the Traffic Control Plans of Technical Specifications.

CHANGEABLE MESSAGE SIGNS (Typical Placement and Messages)

+ 3 MILE

CHANGEABLE MESSAGE SIGN MESSAGE (MAINLINE AND RAMPS)

Symbols
- Channelizing Device (see Index 102-640)
- Work Zone with Flashing Blue Lights
- Portable Changeable Message Sign
- To be placed at the end of pacing operation
- Lane identification and direction of traffic

<table>
<thead>
<tr>
<th>ONE WEEK PRIOR TO PACING OPERATION</th>
<th>EXCEPT DELAYS OR HOLD ON</th>
<th>ROAD WORK FROM 7 AM - 5 PM</th>
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<tr>
<td>ROAD WORK</td>
<td>EXCEPT DELAYS OR HOLD ON</td>
<td>7 AM - 5 PM</td>
</tr>
<tr>
<td>SLow TRAFFIC AHEAD</td>
<td>BE PREPARED TO STOP</td>
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</table>

TRAFFIC PACING

1. When developing a pacing plan, traffic flow points should be identified for these work operations in which the construction problem could create a condition that could not be immediately cleared. A traffic flow point is the safe safe crossing point for traffic traveling on the work that is being performed during the operation. In the unlikely event that the work is not completed during the time estimated for the pacing, the plan or specification should direct the pacing to be continued past the traffic flow point until the traffic flow is cleared. In the event of major construction problems that cannot be immediately cleared, traffic can then be diverted off the facility.

2. The traffic control plans or technical specifications should require the contractor to submit a pacing plan in advance of the operation. The pacing plan should outline the contractor's expected equipment and personnel, outlined the operation, and indicate the contingency plans in the event of the contractor's critical equipment breaks down. If the project includes a dam or reservoir closure, the traffic control plans or technical specifications should be clear that the damage recovery applications to the pacing operation as well.

3. Changeable message signs shall be displayed one week prior to work using messages described in the traffic pacing plan. The number and duration of changeable message signs shall be called out in the traffic control plans.
MOT Session – Standard Plans Updates

Index 706-001: Typical Placement of Raised Pavement Markers

Sheet 4 of 6

Revised RPM and Reflective Yellow Paint placement.
Index 706-001: Typical Placement of Raised Pavement Markers

Sheet 5 of 6

New!

Added sheet showing the placement of RPMs at Limited Access crossovers. This information was previously in FDM 211.3.2.
Added sheet showing the placement of blue RPMs. This information is currently in TEM Section 4.3.
Significant changes on Sheet 1 are the following:

- Added standard details for route shields
- Added pavement message spacing table
Index 711-001: Pavement Markings

Sheet 9 of 13

LEFT ROADWAY CENTERED ON EXISTING ROADWAY

RIGHT ROADWAY CENTERED ON EXISTING ROADWAY

SCHEMES FOR TRANSITION - 2 LANE / 4 LANE ROADWAY

NOTE: If no pavement markings exist for SRT roadway centered on combining roadway, right lane(s), median or combining roadway is served with white pavement markings.

DETAIL "D" - 6" PAVEMENT MARKING (350 FT MIN) - EDGE 9" PAVEMENT MARKING

NOTE: Use Sheet 2 for "E" details.

DETAIL "E" - PAVEMENT MARKINGS FOR TRAFFIC SEPARATION

MARKINGS FOR TRAFFIC SEPARATION

Florida Department of Transportation

MOT Session – Standard Plans Updates

Index 711-001: Pavement Markings
Index 711-001: Pavement Markings

Sheet 10 of 13

Revised sheet to show only basic crosswalk pavement marking details.

Moved to sheet 7 of 13
Index 711-001: Pavement Markings

Sheet 11 of 13
This sheet has been deleted. See Index 509-070 for pavement markings at at-grade railroad crossings.
2018 Process Review – Summary of Findings

- Improper installation and maintenance of temporary barriers and crash cushions
- MOT devices not properly labeled with the APL number
- Improper installation of work zone signage
- Improper installation and maintenance of pavement markings
- Inadequate pedestrian accommodation
Temporary Barrier Issues

Freestanding Type K barrier did not have proper amount of overlapping units. Index 415 requires 2 feet minimum clearance with 6 overlapping units (see screenshot).
Temporary Barrier Issues

Type K barrier did not have proper approach transition from freestanding to anchored (i.e. semi-rigid to rigid condition). Index 414, Sheet 14 requires a 3-3-2-1 anchored approach section from freestanding to bolted or anchored barrier units.
Inadequate deflection space for temporary barrier. Index 412 requires 9 inch deflection for low profile barrier and 414 requires a minimum of 1 foot deflection space for anchored units and 4 foot for freestanding units.
Temporary Barrier Issues

Construction debris, stockpiled material and other objects within deflection space of Type K barrier. Index 415, Sheet 1 requires the deflection space to be clear of any grass, construction debris, stockpiled materials, equipment and objects.
Temporary barrier contained structural cracks through the cross section and damage to anchor slots and connection assemblies. Spec 102-9.1 requires all temporary traffic control devices to meet acceptable standards as outlined in the ATSSA’s Quality Guidelines for Temporary Traffic Control Devices and Features.
Temporary Barrier had improper offset to the Travel Way. Index 415 requires a minimum offset of 1 foot for work zone speeds 45 mph or less.
Temporary Barrier Issues

Type K barrier had improper connection pins. Index 414 requires a rectangular connection pin for proper impact performance (see screenshot below).
Crash Cushion Issues

Crash cushion bracket support for the transition panel was **missing**. Vendor drawings require bracket support for transition panels (see screenshot below).
Quadguard II crash cushion installed without a shim kit
Manufacturer’s vendor drawings requires a shim kit, diaphragm, and rail guide (see screenshot below).
Crash Cushion Issues

Crash cushion with loose nuts. Manufacturer’s vendor drawings require all nuts be snug tight.
Missing APL Numbers

Trailer mounted devices not properly labeled with APL Number. Spec 102-9.1 requires the APL number to be permanently marked on the device at a readily visible location.
Missing APL Numbers

Crash cushions missing APL number. Spec 102-9.1 requires the APL number to be permanently marked on all TTC devices at a readily visible location.
Missing APL Numbers

Work zone sign posts with incorrect, missing or not legible APL number. Spec 102-9 requires all TTC devices be permanently marked on the posts at a readily visible location.
Improper Sign Installation

Project Information Sign with lap splice improperly installed.

APL vendor drawing requires lap splice be installed to front side of post with stub height less than 4”.

Lap splice installed on back side and improper stub height

Note:
Bolts may be installed going either direction.
Improper Sign Installation

Project Information signs were not properly installed with incorrect spacer bars and bolt orientation. Vendor drawings require a rectangular spacer and bolts located either at the 1st and 5th or 2nd and 6th hole (see screenshot below).
Improper Sign Installation

Work zone signs improperly installed on portable sign stands. The vendor drawings require a 48”x48” size sign and be 12” from the bottom of the sign to the ground. Index 600 requires signs to be post mounted when work operations exceed one day.
Improper Sign Installation

Lane Shift Symbol Sign obstructing view of permanent Signal Ahead sign. Index 600 requires sign placements be increased or decreased based on field conditions in order to avoid conflicts or to improve site specific traffic controls.
Pavement Marking Issues

Edge line striping was **missing**. Design Standards, Index 600 requires temporary work zone markings using paint or removable tape.
Pavement Marking Issues

Conflicting or faded pavement markings. Index 600, Sheet 8 requires the removal of existing pavement markings that conflict with temporary work zone delineation when work exceeds one daylight period. Spec 710-4.3 requires work zone markings retroreflectivity to be greater than 150 mcd/lx m2.
Pavement Marking Issues

Pavement Markings were faded and pedestrian signals were not maintained. Spec 710-4.3 requires work zone markings retroreflectivity to be greater than 150 mcd/lx m2 and Spec 102-9.15 requires maintaining functionality of signals.
Pedestrian and ADA Issues

Type II barricades with signs attached to close sidewalks and curb ramps did not have detectable warnings. Index 660 requires pedestrian LCDs be placed across the full width of closed sidewalks and requires curb ramps to have detectable warnings.
The temporary pedestrian walkway was not properly delineated with ped LCDs and the surface was not firm, stable and slip resistant. Design Standards, Index 660 and ADA Guidelines requires all temporary walkways be delineated with ped LCDs on both sides and surfaces be accessible with firm, stable, slip resistant and kept free of obstructions.
Pedestrian and ADA Issues

Newly constructed curb ramps were missing detectable warnings. Spec 527 and ADA requires detectable warnings on all open pedestrian facilities.
Pedestrian and ADA Issues

Pedestrian walkway bridge was not ADA compliant. ADA Standards requires all pedestrian facilities have smooth continuous hand trailing with detectable edging.
Ped LCDs were not properly maintained.

Spec 102-9.1 requires Ped LCDs be maintained in accordance with FDOT’s Ped LCD Evaluation Guide.

Pedestrian and ADA Issues

**Missing detectable warnings and/or crosswalks.** Design Standards, Index 660 and ADA Guidelines require detectable warning (i.e. truncated domes) with properly installed crosswalks.
Research Studies

• **Mobile Operations on Two-Lane Roadways**
  - NCHRP Research was approved and awarded to TTI in April 2018.
  - Problem Statement Summary: This operation presents unique problems due to highly variable conditions encountered in the field, such as number of vehicles in the work convoy, speed of work vehicles, posted speed, roadway geometry, traffic volume, and motorist behavior.
  - Potential Improvements:
    • Truck mounted changeable message signs that can improve driver understanding of specific hazards and desired responses.
    • Addition of flaggers at each end of the mobile operation to provide periodic passing opportunities for motorists.
Research Studies

• Temporary Barrier Gap Spanning Hardware System
  – Funded through Pooled Fund Study.
  – The purpose for this research is to identify a MASH compliant system to span gaps between adjacent temporary barrier systems with lengths ranging from 0.5 ft to 12.5 ft.
  – The system developed was to use thrie beam panels, a steel toe plate, and internal stiffeners.
  – The first test will evaluate the structural capacity of the hardware when spanning the largest gap between the barrier segments.
  – A second test will be conducted to evaluate a potential vehicle stability issue identified through computer simulation on a shorter gap length.
Research Studies

- Temporary Barrier Gap Spanning Hardware System
Research Studies

• Low Profile Barrier Mash Testing
  – UF ran simulation models using MASH criteria which showed promising results.
  – FDOT is contracting with UF to have the low profile barrier physically crash tested to MASH.
  – The plan is to receive those results by Summer 2019
  – Depending on the results, updates to the barrier may be necessary for manufacturing after January 1st, 2020.
Research Studies

• Low Profile Barrier Enhancements
  – Project Benefits:
    • Research would provide enhancements to LPBs to allow for transitions to other barrier types and to crash cushions, which are not currently available options.
    • Some examples include crashworthy end treatments in areas with limited space and transitions from high speed (TL-3) applications to low speed (TL-2) applications.
Questions

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