Origination Form

Specifications

Name:	Richard Stepp	**Specification Number:**	Section Title, 996-1.1, 996-5, 996-5.1, 996-5.1.1, 996-5.1.2, Table 996-4, 996-5.1.3, 996-5.1.4, 996-5.2, 996-5.3, 996-5.3.1, 996-5.3.2, Table 996-5
Email:	richard.stepp@dot.state.fl.us	**Associated Specs:**	635
Date:	2024-06-05T21:41:31Z	**Verified:**	VERIFIED

Summary:

Central Office held multiple meetings with the Florida Turnpike Enterprise (FTE) to clarify miscellaneous items throughout this section, as finalized with FTE subject experts Jason Tosspon, James Beverly, and Eddie Register. In addition to the miscellaneous clarifications, the substantial revisions are listed below: 996-1.1 (GENERAL – NEW AUXILIARY COMPONENTS) – Added new items to the general description that are covered by this Spec section, including surge protection, pull boxes, splice boxes, fiber optic splice vaults, camera lowering devices, and traffic control system auxiliaries; 996-5, 996-5.2 (FIBER OPTIC SPLICE VAULT): Added extensive language to support all-new Standard Plans, Index 635-005 “Fiber Optic Splice Vault”; 996-5.1.1 (MARKINGS) – Added new listed instructions to support the different types of markings on basic pull and splice boxes for “TPK ITS” applications; 996-5.1.2 (DIMENSIONS) – Replaced paragraph instructions for basic pull and splice box dimensions with a new Table 996-4. This is easier to follow and covers more conditions; 996-5.1.4 (LOAD REQUIREMENTS) – Clarified load requirements of ANSI/SCTE TIER 15 for pull boxes and splice boxes for conventional usage and TIER 22 for specific ITS applications on certain toll road corridors; 996-5.3, 996-5.3.1, 996-5.3.2 (TOLL SITE PULL BOXES) – Added “Toll Site Pull Box” language to accommodate this unique pull box type that is generally used around toll sites. This includes marking requirements and pull box dimensions in the new Table 996-5.

Justification:

FTE helped draft the proposed revisions to better handle their needs. The new Spec language handles specialized Toll Site Pull Boxes independently, and it now adds language to support the all-new Standard Plans Index 635-005 "Fiber Optic Optic Splice Vault". This Spec language has already been successfully used as a Blanket MSP for Turnpike projects this past year. Also, the "Fiber Optic Splice Vault" has been published as Developmental Standard Plans for this past year, and it has been successfully incorporated into numerous project plans already.

Do the changes affect other types of specifications?

Neither

List Specifications Affected:

Other Affected Documents/Offices	Contacted	Yes/No

Other Standard Plans	I am the developer of these Standard Plans.	Yes
Florida Design Manual		No
Structures Manual		No
Basis of Estimates Manual		No
Approved Product List		No
Construction Office		No
Maintenance Office		No
Materials Manual		No
Traffic Engineering Manual		No

Are changes in line with promoting and making progress on improving safety, enhancing mobility, inspiring innovation, and fostering talent; explain how?

These revisions were the result of FTE meetings to better meet their needs for Turnpike Pull Boxes and Splice Vaults. This incorporates an innovative new standardized Fiber Optic Splice Vault which incorporates other standardized items for cost efficiency.

What financial impact does the change have; project costs, pay item structure, or consultant fees?

Reduced costs are expected because the Specifications will meet more needs and be easier to understand. This will reduce project-specific design work. Also, standardizing the Fiber Optic Splice Vault creates an an efficient and safe reusable design with economy of scale. Also, the past project-specific designs for the Fiber Optic Splice Vaults are no longer needed, saving time and cost in the future.

What impact does the change have on production or construction schedules?

This will reduce project-specific design time once required to meet miscellaneous needs that are now covered in these Spec revisions. Also, the past project-specific designs for the Fiber Optic Splice Vault are no longer needed, saving time and cost in the future.

How does this change improve efficiency or quality?

See production and construction schedule response. These revisions optimizes load resistance requirements for specific pull box usages, improving durability where needed. This also provides information for a newly standardized Fiber Optic Splice Vault, which is expected to provide a more consistent and high quality end product.

Which FDOT offices does the change impact?

Design, Construction

What is the impact to districts with this change?

These changes were requested by the FTE. See production and construction schedule response.

Does the change shift risk and to who?

No

Provide summary and resolution of any outstanding comments from the districts or industry.

Comments and Responses are available on the Track the Status of Revisions hyperlink located on the Specifications landing page: https://www.fdot.gov/programmanagement/Specs.shtm

What is the communication plan?

Through the established specification revision process (e.g., Internal and Industry Review)

What is the schedule for implementation?

The Standard Specifications eBook and Workbook are effective July 1st every year.

INTELLIGENT TRANSPORTATION SYSTEM DEVICE AND AUXILIARY COMPONENT MATERIALS
(REV 6-5-24)

SUBARTICLE 996-1.1 is deleted and the following substituted:

996-1 Description.

996-1.1 General: This Section governs the requirements for all permanent intelligent transportation system devices, surge protection devices for traffic control devices, pull boxes, splice boxes, fiber optic splice vaults, camera lowering devices, and traffic control system auxiliaries. All equipment shall be permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number.

ARTICLE 996-5 is deleted and the following substituted:

996-5 Pull Boxes, ~~and~~ Splice Boxes, and Fiber Optic Splice Vaults.

996-5.1 ~~General~~Pull and Splice Boxes: Pull and splice boxes ~~shall~~must be listed on the Department's Approved Product List (APL). Manufacturers seeking evaluation of their product shall submit an application in accordance with Section 6.

The box bodies and covers shall be free of flaws such as cracks, sharp, broken, or uneven edges, and voids.

Ensure in-ground boxes have an open bottom design.

996-5.~~2~~ 1.1 Marking: The following information shall be permanently cast or engraved into the top surface of all pull and splice box covers. If used, identification plates shall be UV stable, mechanically fastened, bonded with adhesive material suitable for outdoor applications, and capable of installation in the field

1. Mark application as follows:
   - FDOT TRAFFIC SIGNAL for signalized intersections
   - FDOT FIBER OPTIC CABLE for fiber optic cable
   - FDOT LIGHTING for highway lighting
   - FDOT TRAFFIC MONITORING for traffic monitoring
   - FDOT ELECTRICAL for other electrical applications
   - TPK ITS FIBER OPTIC for Turnpike ITS fiber optic cable
   - TPK ITS ELECTRIC for Turnpike ITS electric power
   - TPK ITS LOCATE for Turnpike ITS fiber locate cables
   - TPK ITS COMPOSITE for Turnpike ITS electric power (<50 Volts)
   - TPK LIGHTING for Turnpike highway lighting
2. Manufacturer's name or logo
3. FDOT APL approval number
4. TIER rating per Section 996-5.1.4

The date of manufacture (month/day/year, or date code) shall be permanently located on the top or bottom of the cover. The interior of the box body shall have a permanent marking that includes the manufacturer part/model number and date of manufacture near the top of box in a location that is visible after installation when the cover is removed.

996-5.3 1.2 Dimensions: For signalized intersection and lighting applications, pull boxes with nominal cover dimensions of 13 inches wide by 24 inches long or larger and no less than 12 inches deep shall be provided. The inside opening area shall be a minimum of 240 square inches and no inside dimension shall be less than 12 inches.

For fiber optic cable applications, pull boxes with nominal cover dimensions of 24 inches wide by 36 inches long or larger and no less than 24 inches deep shall be provide

Rectangular splice boxes with nominal cover dimensions of 30 inches wide by 60 inches long or larger and no less than 36 inches deep shall be provided. Round splice boxes with a nominal cover diameter of 36 inches or larger and no less than 36 inches deep shall be provided.

Table 996-4
Minimum Dimensions for Pull and Splice Boxes

Application:	Type:	Minimum Size:	Notes:
Signalized Intersection and Lighting	Pull Box	13W x 24L x 12D	Provide a minimum area of 240 square inches and no inside dimension less than 12 inches.
Fiber Optic Cable	Pull Box	24W x 36L x 24D	
ITS	Rectangular splice box	30W x 60L x 36D	
	Round splice box	36Dia. x 36D	

996-5.4 1.3 Fabrication: Box covers shall be constructed of concrete, polymer concrete or other materials meeting the requirements of this Section.

Box covers with lifting slots and a flush-seating lockdown mechanism shall be provided. Penta-head or other non-standard, security type lockdown lag bolts shall be used. Lockdown bolts and lifting slots shall be Type 316, 304, or 302 passivated stainless steel or brass. Lockdown bolt assembly shall be designed to prevent seizing and can be removed without damaging the cover or box body. The lockdown bolt threaded insert/nut assembly shall be field replaceable.

996-5.5 1.4 Testing Requirements: Pull and splice boxes shall must meet have or exceed the a TIER 15 load capacity per the American National Standards Institute/Society of Cable Telecommunications Engineers (ANSI/SCTE) 77 2017 Specification for Underground Enclosure Integrity. for TIER 15 loading requirements with Pull and splice boxes must have a TIER 22 load capacity when used for ITS applications on toll road corridors; this excludes express lane corridors.

Additionally, meet the following additional clarifications and requirements:

1. Apply all environmental tests to the box and its cover.
2. All flexural testing shall be conducted in accordance with an appropriate ASTM standard and clearly stated in the report.
3. Perform repetitions of Cycle 1 in Table X2.1 of ASTM G154 for a minimum duration of 1000 hours for the simulated sunlight exposure test.
4. Use deflection-measuring devices positioned to measure vertical and lateral deflection (wherever maximum deflection occurs) for the vertical sidewall load test.

5. Conduct the lateral sidewall pressure, vertical sidewall load and cover vertical load tests without any removable or permanent wall to wall supporting beams located in the interior or top of the box opening.

When testing pull and splice boxes of various sizes (width x length x depth), the cover impact test, internal equipment protection test, coefficient of friction test, and all environmental tests, can be completed using a single representative box/cover (instead of samples from all box/cover sizes) as long as the test report indicates the following:

1. Materials of construction, compositions, and manufacturing processes are identical for all box and cover sizes submitted for listing on the APL.

2. Size (width x length x depth) of the representative box/cover.

996-5.2 Fiber Optic Splice Vaults: Construct fiber optic splice vaults in accordance with Standard Plans, Index 635-005.

Manufacturers of fiber optic splice vaults must meet the requirements of Section 105 and be listed on the Department's Production Facility Listing.

Construct the vault top and bottom with concrete in accordance with Section 346, and use steel reinforcement bars in accordance with Section 415.

Construct the concrete apron per the requirements of Section 347.

Use non-shrink grout per the requirements of Sections 400 and 934.

Provide hook racks and mount them to the interior walls of the fiber optic splice vaults per the Standard Plans. Precast steel inserts into the vault's interior walls, and attach the racks using galvanized steel bolts threaded into these inserts.

Provide cable support hooks and mount them to the compatible installed hook racks for supporting the fiber optic cabling and fiber optic splice enclosures. Provide two hooks per rack as shown in the Standard Plans.

Racks, cable support hooks, and inserts must be made of steel material that is galvanized per ASTM A153 or A123.

996-5.3 Toll Site Pull Boxes: In addition to the Pull Box requirements of 996-5.1, use UL listed or other National Recognized Testing Laboratory (NRTL) listed handhole enclosures (pull and splice boxes) from the APL.

Use un-reinforced polymer concrete enclosures for toll site pull box covers. Provide one-piece covers with two hold-down bolts.

996-5.3.1 Toll Site Pull Box Marking: The following information must be permanently cast or engraved into the top surface of all pull and splice box covers. If used, identification plates shall be UV stable, mechanically fastened, bonded with adhesive material suitable for outdoor applications, and capable of installation in the field.

1. Mark application as follows:
   - TPK TOLL LOOPS for loops
   - TPK GANTRY DATA for gantry data
   - TPK GANTRY POWER for gantry power
   - TPK ITS INTERFACE for ITS lateral
2. Manufacturer's name or logo
3. FDOT APL approval number
4. TIER rating per Section 996-5.1.4

The date of manufacture (month/day/year, or date code) must be permanently located on the top or bottom of the cover. The interior of the box body must have a

permanent marking that includes the manufacturer part/model number and date of manufacture near the top of box in a location that is visible after installation when the cover is removed.

996-5.3.2 Toll Site Pull Box Dimensions: The dimensions for pull boxes used at toll sites are listed below:

Table 996-5
Minimum Dimensions for Toll Site Pull Boxes

Application:	Type:	Size (inches):
Gantry power	Pull Box	24W x 36L x 24D
Gantry data		
Fiber optic cable		
Leased line communications		
Toll Loop	Pull Box	30W x 48L x 24D
Grounding	Pull Box	12W x 12L x 12D