

**FY 2020/2021 QC Category No. 12A  
STATEWIDE INSPECTION GUIDELIST  
Signalization**

**GENERAL**

1. Use the FDOT's Submittal Data – Traffic Control Equipment Form (750-010-02) and the approved shop drawings to confirm items installed are listed on the Approved Product List (APL), or when APL listing is not required, meet the Specs. [Spec. 603]
2. A pre-installation meeting should be conducted with the signal Contractor, maintaining agency, etc. to discuss signalization issues. Discuss with contractor his plan for staging of equipment for drilled shafts installation, giving consideration for single and double lane closures as well as closures of side streets, overhead utilities, access points and if necessary coordination with adjacent property owners to access the shaft location from private property with permission. [CPAM 3.1, Good Practice]

**MAST ARMS**

3. Mast arm shop drawings submitted in accordance with approved schedule well in advance of installation due to long lead time (3-6 months). [Good Practice]
4. Confirm Drilled Shaft Installation Plan is submitted and approved. [Spec. 455-15]
5. Mast arm foundations constructed in accordance with the Plans, Special Provisions, and Specifications. [Spec. 455-15]
6. Upon delivery, verify mast arm dimensions match the shop drawings and plans. Verify all vertical poles have ID tag installed with required information and proper location per Index 649-031.[Good Practice]
7. Wire the signal cable in the mast arms in accordance with the Plans, Specifications and/or the maintaining agency's color code. [Plans, Spec. 632]
8. Witness the contractor tighten all bolts and ensure all faying edges are in full contact after bolt tightening. Bolts should be tightened to a snug tight condition in accordance with Specification 649-5. [Spec 649]

**ACCEPTANCE PROCEDURES (SECTION 611)**

9. Witness completion of all field testing with the Contractor's representative and, with a representative from the maintaining Agency, if required. [Spec. 611-2, 611-4]
10. Warranty Period: Meet with the signal Contractor and the maintaining agency to discuss method of handling warranty period. Record model and serial numbers of electronic equipment. Establish a method to track all trouble calls during the warranty

period. Notify the Contractor of equipment malfunctions during the life of the contract and document the Contractor's response times. Record and track all equipment malfunctions and repairs during the life of the contract. Provide a letter to the maintaining agency and the Contractor documenting the beginning and anticipated end of the warranty period. [Spec. 611-5, Good Practice]

### ***SIGNAL INSTALLATION GROUNDING (SECTION 620)***

11. Installation of the required number and length of ground rods to be observed. [Spec. 620-3]

12. The resistance of each ground rod is to be measured and recorded (if required by Contract Specifications) and the buried location of each ground rod is to be staked. [Spec. 620-3]

13. Ensure that all separately grounded elements at an intersection are bonded to form an intersection grounding network. [Spec. 620-3, Index 639-002]

### ***CONDUIT AND SIGNAL AND INTERCONNECT CABLE (SECTIONS 630 AND 632)***

14. Conduit used is the proper type for the type of installation being performed. The conduit is installed at the proper depth. [Spec. 630, Index 630-001]

15. The proper number of conduit stub-outs, including spares, are provided through the cabinet base. [Plans and Index 676-010]

16. All conduit trenches are appropriately backfilled. [Index 630-001, Spec. 630-3].

17. Seal conduit ends in a controller base, pole, pull box, junction box, or pedestal with approved moisture resistant material approved by the Engineer. [Spec. 630-3.5, Index 630-001]

18. Signal cable meets requirements. [Spec. 632]

19. The signal cable is to be installed in continuous lengths between controller cabinets, disconnect hangers (or signal heads for non-span wire installations), pedestrian signal heads, and pedestrian detectors. [Spec 632-3]

20. The communication cable is to be installed in continuous lengths to and between controller cabinets and junction boxes. [Spec. 633-3.2]

21. The signal cable is to be properly attached to the messenger wire. [Index 634-001]

22. Pull wire or cord is installed per [Spec 630-3.1].

### ***PULL and FIBER OPTIC BOXES***

23. Verify that box is listed on Approved Product List (APL) and is marked with the APL number. [Spec. 635-2]

24. All pull and fiber optic boxes shall have a 1'-0" wide and 6" deep concrete aprons sloped away from box. [Index 635-001]

25. For fiber optic pull boxes, install ground rods as required and shown in the plans. [Spec. 630-2.3, Index 635-001]

26. Store a total of 200 feet of fiber optic cable in fiber optic splice boxes. [Spec. 633-3.1.4]

27. Store 50 feet of spare fiber optic cable in fiber optic pull boxes [Spec. 633-3.1.4]

28. Do not place the pull or fiber optic boxes in roadways, driveways, parking areas, ditches, or public sidewalk curb ramps [Spec. 635-3.2]

29. Ensure that all pull box covers include words describing the application for which it is to be used, such as "FDOT TRAFFIC SIGNAL" (signalized intersection applications), "FDOT FIBER OPTIC CABLE (fiber optic cable applications), FDOT ELECTRICAL (other electrical applications), FDOT LIGHTING (highway lighting applications), FDOT TRAFFIC MONITORING (traffic monitoring applications), or text as shown in the plans permanently cast into their top surface. [Spec. 635-2.2.2]

30. Never place expansion material around pull boxes in sidewalk. The pull box must bond to the sidewalk to avoid differential settlement. [Good Practice.]

#### **SPAN WIRE ASSEMBLY (SECTION 634)**

31. Span wire, fiberglass insulators, and associated hardware comply with Specification and installation requirements. [Spec. 634-2, 634-3, Index 634-001, Plans]

32. Span wires to be of one continuous length with no splices except where an insulator is required. [Spec. 634-3.3]

33. Ensure the span wire assembly is installed with the correct amount of sag. [Spec. 634-3.3]

#### **PRESTRESSED CONCRETE POLES (SECTION 641)**

34. The poles are set to the depth specified in the [Plans.]

35. The oval eye bolts are located in accordance with the pole guide schedule [Plans, Shop Drawings]

- 36. FDOT approved material is used for the footing. [Spec. 641-4]
- 37. The area around the pole is properly backfilled and tamped. [Spec. 641-4]
- 38. The pole is installed out of plumb at the correct angle of rake. [Mfgr's Rec.]

***SIGNAL HEAD ASSEMBLIES (SECTION 650)***

- 39. Verify that the Light Emitting Diodes (LEDs) modules are listed on the APL. [Spec. 650-2]
- 40. Two each ¼" diameter weep holes are drilled in the bottoms of each signal head assembly. [Spec. 650-3.9, Index 634-001]
- 41. Traffic signal heads are installed in the proper location, aimed properly, and set with the proper horizontal and vertical clearances. [Spec. 650-3]
- 42. For vertically mounted 5-section clusters, construct the signal assembly so that door hinges are located along the outside edges of the complete signal assembly and each section opens away from the horizontally adjacent section. [Spec. 650-2]

***PEDESTRIAN SIGNALS (SECTIONS 653 AND 665)***

- 43. Pedestrian signs match the type of visual signal on the pole, i.e., international visual signal with international type signs. [Index 665-001]
- 44. Install Pedestrian detector controls with the center line of the push button 42" above finished walking surface immediately below the control, except where 2 push buttons installed on the same pole conflict. Then set the center line of one at 42" and the other as close as practical above it within the range of 42 to 48". [Index 665-001]
- 45. Use only an ADA (Americans With Disabilities Act) compliant pedestrian detector push button assemblies listed on the FDOT APL and marked according to spec. [Spec. 603-6, 665-2]

***INDUCTIVE LOOP DETECTORS (SECTION 660)***

- 46. Use inductive loop detectors, preformed loop assemblies and loop sealant on the FDOT's Approved Products List. [Spec. 660-1]
- 47. Confirm that loop wire, lead-in cable, and splicing materials meet the standard requirements. [Spec. 660-2]
- 48. The required number and type of inductive loop assemblies is installed in accordance with the [plans and pay item numbers].

49. All loop assemblies are installed at the proper distance from the stop bars. [Plans, Index 660-001]

50. All loop assemblies to be installed in accordance with [Index 660-001, Spec. 660].

51. All loop wires are held down to the bottom of the saw cut with proper hold down material and then properly sealed. [Spec. 660-3, Index 660-001]

52. All wires are megged out for correct resistance values. Contractor to provide report and loops certification. [Spec. 611-4, 660-3]

53. Loop wires are spliced as detailed in Index and spec. [Spec. 660-2, 660-3, Index 660-001]

### ***TRAFFIC CABINETS (SECTION 676)***

54. Controller cabinet is on the Approved Products List. [Spec. 676-2]

55. Controller cabinet is sealed at its contact to the concrete base and all field wiring is neatly bundled and labeled. [Spec. 676-3]

56. Make sure that the Contractor is connecting all fork or ring terminals to the cable conductor ends (signal cable, communication cable, loop wires) using a calibrated ratchet crimping tool. [Spec. 632-3, 660-3, 676-3]

### ***ELECTRICAL POWER SERVICE (SECTION 639)***

57. For the service disconnect (main circuit breaker) between the meter and the controller cabinet (located on a separate power service pole) use a manually re-settable circuit breaker which has a larger amperage rating than the amperage rating of the equipment circuit breaker to which electrical power is being provided. Note the minimum allowable size for this main circuit breaker is 40 amps where the rating of the equipment circuit breaker to which electrical power is being provided is less than 40 Amps. Use a surge lightning arrestor rated for a maximum permissible line to ground voltage of 175 V<sub>AC</sub>. [Spec. 639-3, Index 639-002]