Mast Arm

Roadway Lighting

Signal Support Arm

POLE EXTENSION FOR LIGHTING LUMINAIRE

Anchor Bolts with Standard Steel Hex nuts and Plain Washers. Tighten nuts using turn-of-the-nut method according to C&M's 560-05 and 538-03 C except that match-marks shall be pasted nut. (Typ.) (See Note 19)

POLE DETAILS

BASE PLATE

POLE IDENTIFICATION

Tag per C&M's 732.11

LEGEND:

= Required dimension see Note 2

NOTES:

1. The design of the Single Arm Overhead Signal Support meets the requirements of the AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, First Edition 2013 (LRFD-1.5-1) and all interim revisions prior to the bid date of the project.

2. Dimensions noted as required shall be as indicated on the drawing and shall not be altered.

3. Calculations are required for any modifications to the information shown on the drawings. Modifications shall meet the requirements of LRFD-1.5-1 and the design criteria shown in Note 33. Calculations shall be stamp excavated by a Professional Engineer registered in the State of Ohio and shall be submitted for review and approval with the shop drawings.

4. Arm plate hole diameter shall be bolt diameter plus 1/8". Plate hole shall have threads with 72% (min.) full profile height. Threads may be rethreaded after galvanizing.

5. For sign mounting details, see Standard Construction Drawings (SCDs) TC-16.22 and TC-41.41.

6. For foundation details, see SCD TC-21.21.

7. The arm attachment plate and pole attachment to the base plate shall be welded using a full penetration weld.

8. For signal attachment details, see SCD TC-85.20.

9. For foundation details, see SCD TC-21.21.

10. A minimum of one bolt thread shall remain above the washer nut.

11. All unused couplings shall be provided with a removable galvanized cast iron plug.

12. For pole and base plate dimensions, see Sheet 2.

13. The wire entrance part of the signal head may be oriented in any direction to keep the cable drip loop from rubbing on the signal head. The signal head shall hang level and plumb.

14. For construction details and location of handholes, see SCD TC-22.10.

15. The design was based on Fatigue Category II. See Note 33 for additional design criteria.

16. Connection bolts shall be ASTM F3125 Grade A325, washers shall be ASTM F959 compressible washer type Direct Tension Indicators (DTI). If necessary, 1/8" DTI washers shall be ground or reamed to properly fit over attachment bolts. Provide proper DTI interfered to Engineer. An ASTM F959 washer shall be used directly under the head of the bolt with all DTI washers. Assure that the flat washer does not spin during bolt tightening with DTI washer.

17. Negative arm and slope is acceptable to achieve rise requirement.

(cont'd - see Sheet 2)
NOTES:

18. On arms longer than 50 feet, install an effective supplemental damping device, supplied by or recommended by the support manufacturer. The device shall not extend to the ground. Any spacer required shall be a thickness acceptable to the manufacturer for a nominal 50-year support service life. It shall not exceed 0.010 inch per year service life. The thickness shall be at least 0.010 inch per year service life.

19. Ring-shaped wrap-around horizontal plates are permitted as an alternate shown to the horizontal plates shown.

20. All backplates shall have louvers and 2' fluorescent yellow reflective borders. Strobes shall not be applied over backplates. Louvers shall be arranged to allow air to enter the openings facing alternate directions by groups. Louver open area shall be at least 8 percent of the total backplate area.

21. All horizontal plates shall be calculated based on the critical moment and foundation elevations, as outlined in Traffic Engineering Manual section 460.


23. Steel hardware - Galvanizing - ASTM A 153 (Hot-dipped) with the following limitations:
   - All material shall meet the requirements of C&MS 730.19.
   - Modifications to the specifications shall be submitted to the ODOT Office of Materials Engineer.
   - All welds shall be inspected according to the Welding Code - Steel. A report of the welding inspection shall be submitted to the ODOT Office of Materials Engineer.

24. All material shall meet the requirements of C&MS 730 with the following limitations:
   - Steel hardware - Galvanizing - ASTM A 153 (Hot-dipped) (Not ASTM B 665 Close-Up)

25. Nuts shall meet the requirements of C&MS 730.08 and shall also meet the requirements of ASTM F 593 Grade 2H or A 193 Grade 2H.

26. Flat washers shall meet the requirements of C&MS 730.08 and shall also meet the requirements of ASTM F 439.

27. Anchor bolts shall meet the requirements of C&MS 502.11, 711.02, 730.02, and 732.11 except that 730.02 shall be modified to require the galvanizing limits to be the bolt length of the anchor bolts not at least 2 inches beyond the throat.

28. Anchor bolt nuts shall meet the requirements of ASTM F 593 Grade 2H or A 193 Grade 2H.

29. Anchor bolt washers shall meet the requirements of C&MS 730.19. Modifications to the holes must be approved by the Engineer. Edging or sloping holes to match mis-aligned anchor bolts will not be permitted.

30. All welds shall be inspected according to the requirements of C&MS 630.05 and AWS D1.1 Structural Welding Code - Steel. A report of the welding inspection shall be submitted to the ODOT Office of Materials Management Structural Welding and Materials Engineer.

31. If shown in the plans as supporting CCTV, Stop Bar or Advanced Video Detection, Emergency Vehicle Preemption, or similar pole-mounted appurtenances, the pole height above the arm centerline shall be increased to 5 feet from 1 foot 6 inches. If safety conflicts exist, then the typical 1 foot 6 inches shall apply.

32. Loads shall be limited to 500 pounds per foot. These loads do not include any mechanical damping device is required.

33. Design Criteria:

   Load Parameters:
   - Wind Load: 700 year 90% Basic Wind Speed Map, 115 mph Design Wind Speed
   - Service Life: Infinite per LRFD-1 Table 11.9.3
   - Service Load Velocity: 76 mph per LRFD-1 Table 8.4.1 and Figure 3.8-4B
   - ADT: Greater than 10,000

   Serviceability Parameters:
   - Deflection: maximum of 1/500 under Service Load 1 (Dead Load + Wind) per ODOT
   - Permanent Camber: 1/1000 per LRFD-1 Table 10.5
   - Service Life: Infinite per LRFD-1 11.9.3

Fatigue Parameters:
   - Fatigue Category: X'
   - Natural Wind Gust: Include
   - Truck-induced Gust: Include
   - Gating: Do not include (mechanical damping device is required)

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.

(NOTE B)

| DESIGNATION NO. | MAXIMUM DESIGNS AREA SQ. FT (NOTE A) | DESIGN DISTANCE FROM CUT (FT.) | WALL THICK | SIZE | WALL THICK | SIZE | MAX LENGTH | WALL THICK | SIZE | BOLT CIRCLE | RADIUS | S | J | T | H | C |
|----------------|--------------------------------------|-----------------------------|-----------|------|-----------|------|------------|-----------|------|-------------|--------|-----|-----|-----|-----|
| 2 | .25 | 31.5 | .239 | 11.5 x 7.46 x ** | .179 | 8 x 3.52 | 32 | 16.50 | 14.00 | 12.00 | 9.00 | 2.00 | 2.00 | 1.25 | 7.00 | .375 | 15.00 | 15.63 | 15.67 | 2.00 | 1.88 | 9.50 |
| 4 | .42 | 37.5 | .250 | 13 x 3.98 x ** | .239 | 10.32 x 7.94 x 17.71" | 15.50 | 14.00 | 12.00 | 9.00 | 2.00 | 2.00 | 1.50 | 8.75 | .375 | 18.00 | 18.00 | 12.75 | 2.00 | 2.13 | 17.25 |
| 12 | .42 | 47.5 | .3125 | 14 x 10.36 x ** | .239 | 11.52 x 7.71" | 15.50 | 14.00 | 12.00 | 9.00 | 2.00 | 2.00 | 1.50 | 8.75 | .375 | 20.00 | 20.00 | 14.13 | 2.00 | 2.38 | 8.75 |
| 13 | .40 | 59.5 | .3125 | 16 x 12.38 x ** | .239 | 13 x 9.67 x 29.82" | 15.50 | 15.50 | 15.00 | 12.00 | 2.00 | 2.00 | 1.50 | 8.25 | .375 | 22.00 | 22.00 | 15.98 | 2.00 | 2.28 | 8.50 |
| 14 | .38 | 69.5 | .3125 | 17 x 13.35 x ** | .239 | 14 x 8.87 x 37.15" | 15.50 | 15.50 | 15.00 | 12.00 | 2.25 | 2.75 | 1.50 | 9.25 | .375 | 27.00 | 27.00 | 15.98 | 2.00 | 2.38 | 8.75 |

NOTES:

A. Minimum design area is based on wind loads with a mean recurrence interval of 700 years.

B. These designs use full penetration welds at the arm and base plate connections

* Required dimension, see Note 2

** See Note 2