

NOTES:

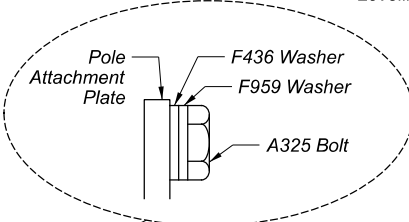
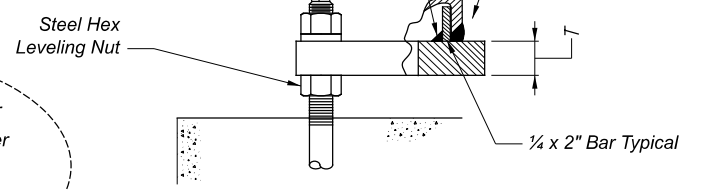
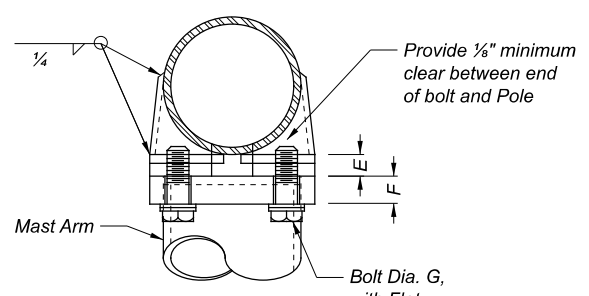
- The design of the Single Arm Overhead Signal Support meets the requirements of the AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, First Edition 2015 (LRFDLTS-1) and all interim releases prior to the bid date of the project.
- Dimensions noted as required shall be as indicated on the drawing and shall not be altered.
- Calculations are required for any modifications to the information shown on the drawings. Modifications shall meet the requirements of LRFDLTS-1 and the design criteria shown in Note 33. Calculations shall be stamped by a Professional Engineer registered in the State of Ohio and shall be submitted for review and approval with the shop drawings.
- Arm plate hole diameter shall be bolt diameter plus 1/8". Pole tapped hole shall have threads with 75% (min.) full profile height. Threads may be retapped after galvanizing.
- For sign mounting details, see Standard Construction Drawings (SCDs) TC-16.22 and TC-41.41.
- For foundation details, see SCD TC-21.21.
- The arm attachment plate and pole attachment to the base plate shall be welded using a full penetration weld.
- For signal attachment details, see SCD TC-85.20. All signal heads shall be installed with the horizontal center of the entire head centered on the arm, +/- 6".
- For modification of pole to support roadway lighting, see SCD HL-10.12.
- A minimum of one bolt thread shall remain above the anchor nut.
- All unused couplings shall be provided with a removable galvanized cast iron plug.
- For pole and base plate dimensions, see Sheet 2.
- 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.
- For construction details and location of handholes, see SCD TC-22.10.
- The design was based on Fatigue Category II. See Note 33 for additional design criteria.
- Connection bolts shall be ASTM F3125 Grade A325. Washers shall be ASTM F959 compressible washer type Direct Tension Indicators (DTI). If necessary, I.D. of DTI washers shall be ground or reamed to properly fit over attachment bolts. Provide proper DTI feeler gage to Engineer. An ASTM F436 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.
- Negative arm end slope is acceptable to achieve rise requirement.

LEGEND:

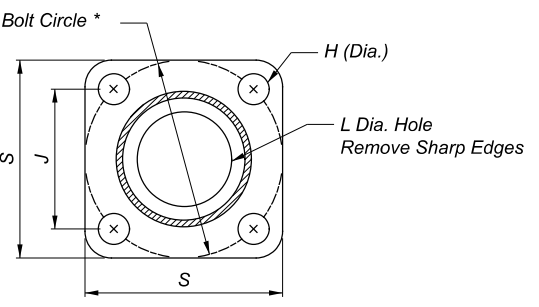
* = Required dimension see Note 2

(cont'd - see Sheet 2)

Anchor Bolts with Standard Steel Hex Nuts and Plain Washers. Tighten nuts using turn-of-the-nut method according to C&MS 630.06 and 513.20.C except that match-marks shall be paint not crayon. (Typ.) (See Note 10)



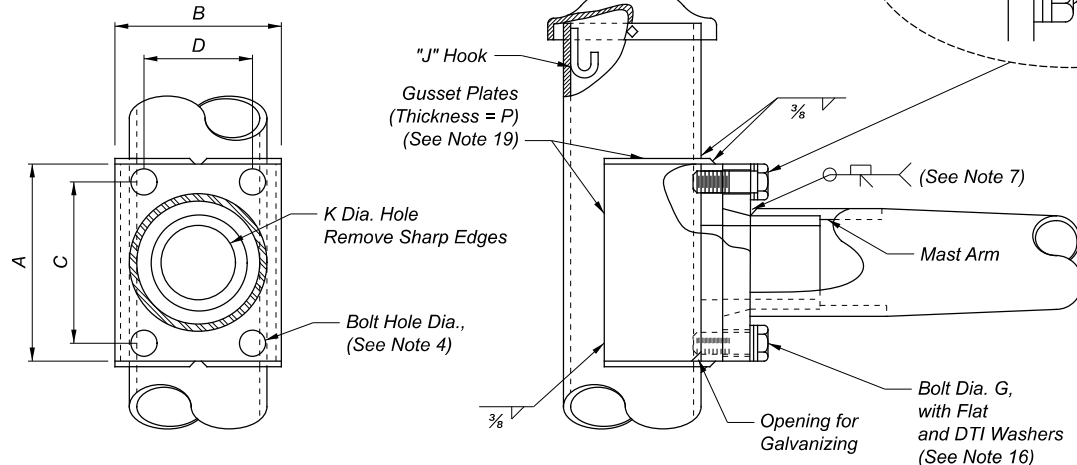
POLE DETAILS



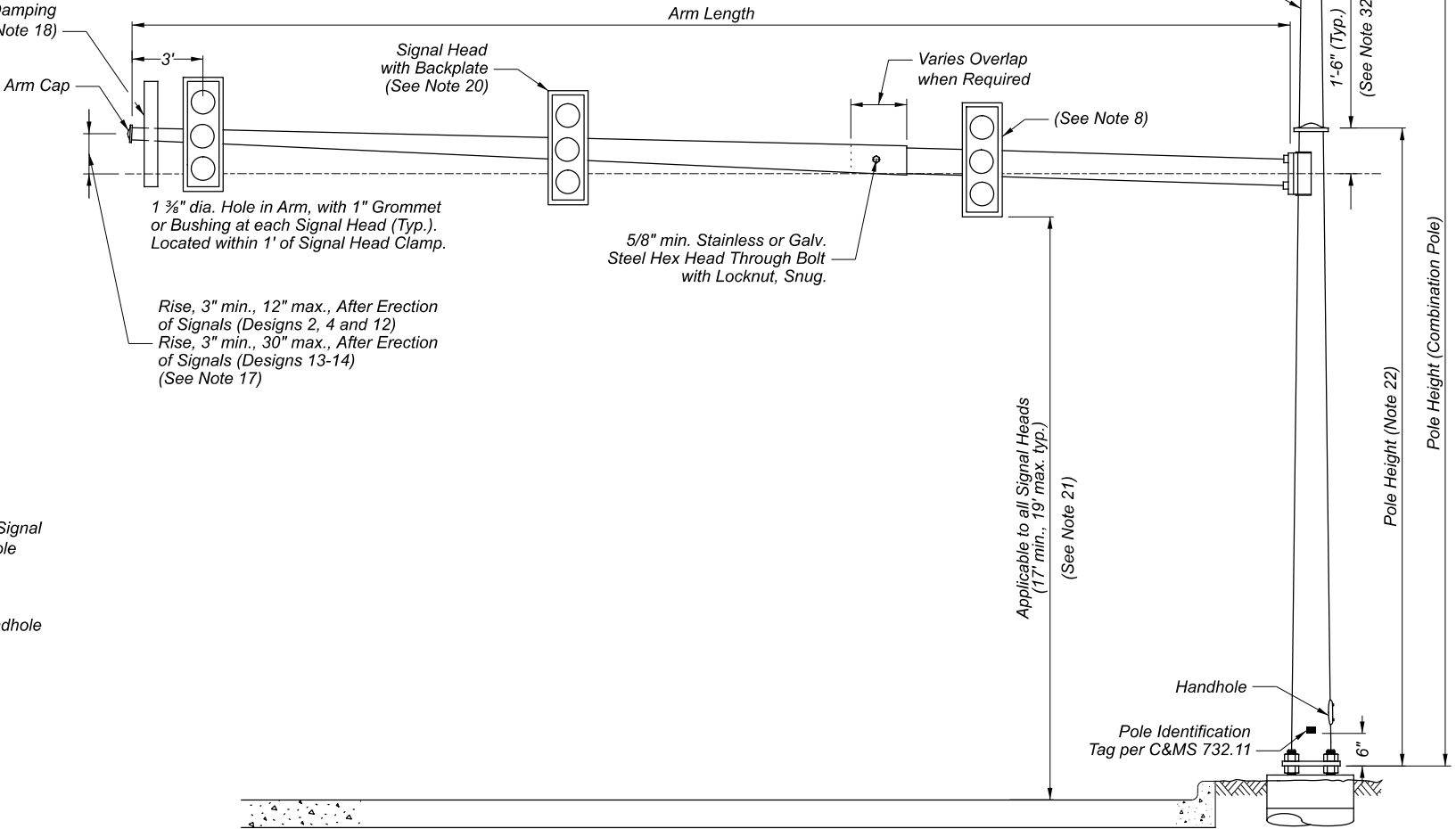
BASE PLATE

Pole Shall be Vertical with Max. Offset of S/3 Along Centerline

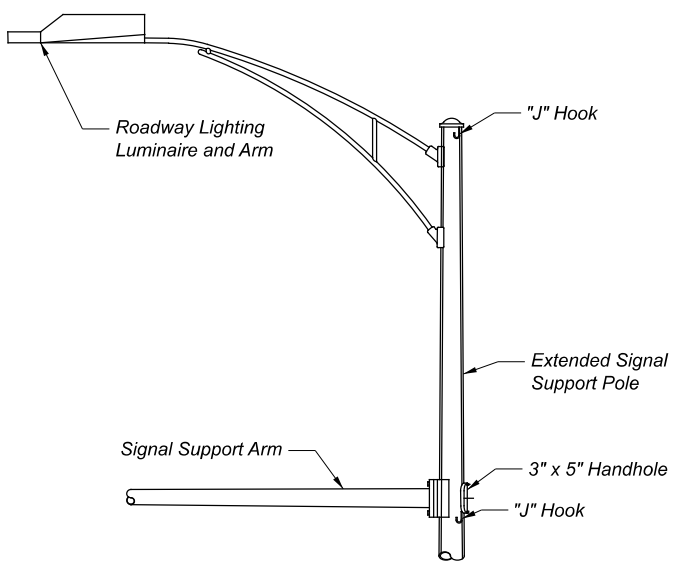
ARM ATTACHMENT



Supplemental Damping Device, Typ. (See Note 18)



POLE EXTENSION FOR LIGHTING LUMINAIRE



NOTES: (cont'd from Sheet 1)

- 18. On arms longer than 59 feet, install an effective supplemental damping device, supplied by or recommended by the support manufacturer. This device shall limit galloping fatigue stress below a threshold acceptable to the manufacturer for a nominal 50-year support service life. Intall within 10% of the mast arm length from the end, but no closer than 1 foot from the end of the arm.
- 19. Ring-stiffened wrap-around horizontal plates are permitted as an alternative shown to the horizontal plates shown.
- 20. All backplates shall have louvers and 2" fluorescent yellow reflective border. Border shall not be applied over louvers. Louvers should be oriented to scoop air from the front side and oriented with the openings facing alternate directions by groups. Louver open area shall be at least 8 percent of the total backplate area.
- 21. 17' min. clearance to bottom of backplate. 19' is the maximum clearance height. However, clearances above this threshold can be accepted upon approval of the project engineer only if clearance heights conform to the requirements set forth in the Ohio Manual of Uniform Traffic Control Devices.
- 22. Actual pole height shall be calculated based off the critical pavement and foundation elevations, as outlined in Traffic Engineering Manual section 440.
- 23. Tapered steel tubes for the poles and arms shall meet the requirements of ASTM A 595 Grade A.
- 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 695 Class 50)

- 25. Nuts shall meet the requirements of C&MS 730.08 and shall also meet the requirements of ASTM A 563 Grade DH or A 194 Grade 2H.
- 26. Flat washers shall meet the requirements of C&MS 730.08 and shall also meet the requirements of ASTM F 436.
- 27. Anchor bolts shall meet the requirements of C&MS 632, 711.02, 730.02 and 732.11 except that 730.02 shall be modified to require the galvanizing limits to be the full length of the anchor bolts not at least 2 inches beyond the threads.
- 28. Anchor bolt nuts shall meet the requirements of ASTM A 563 Grade DH or A 194 Grade 2H.
- 29. Anchor bolt washers shall meet the requirements of ASTM F 436 Type 1 (Hot-dip galvanized) according to ASTM A 153.
- 30. Holes for high-strength bolts and bearing bolts shall meet the requirements of C&MS 513.19. Modifications to the holes must be approved by the Engineer. Enlarging or slotting holes to match mis-aligned anchor bolts will not be permitted.
- 31. All welds shall be inspected according to the requirements of C&MS 630.06 and AWS D1.1 Structural Welding Code - Steel. A report of the welding inspection shall be submitted to the ODOT Office of Material Management Structural Welding and Materials Engineer.
- 32. 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 utility conflicts exist, then the typical 1 foot 6 inches shall apply.

33. Design Criteria:

Load Parameters:

Wind Load: 700-year MRI Basic Wind Speed Map,
115 mph Design Wind Speed

Service Life: Infinite per LRFDLTS-1 11.9.3

Service I Wind Velocity: 76 mph per LRFDLTS-1 Table
3.4.1 and Figure 3.8-4b

ADT: Greater than 10,000

Serviceability Parameters:

Deflection: maximum of L/150 under Service Load 1
(Dead Load + Wind) per ODOT

Permanent Camber: L/1000 per LRFDLTS-1 10.5

Rake (Pole Tilt): H/180 (H = pole height)

Horizontal Deflection at Top of Pole: maximum 1.5%
of pole height

Slope at Top of Pole: maximum of 0.35 inch/foot
(1.67 degrees) per LRFDLTS-1 10.4.2.1

Fatigue Parameters:

Fatigue Category: II

Natural Wind Gust: Include

Truck-Induced Gust: Include

Galloping: Do not include (since Mechanical Dampening
device is required)

ALL DIMENSIONS ARE IN INCHES, UNLESS OTHERWISE NOTED.
(NOTE B)

DESIGN NO.	MAXIMUM DESIGN AREA SQ. FT. (NOTE A)	DESIGN DISTANCE FROM CL (FT.)	POLE		ARM			TWO PIECE ARM		ARM ATTACHMENT										ANCHOR BASE					
			WALL THICK	SIZE	WALL THICK	SIZE	MAX LENGTH	WALL THICK	SIZE	A	B	C	D	E	F	G	K	P	BOLT CIRCLE*	S	J	T	H	L	
2	25	31.5	.239	11.5 x 7.86 x **	.179	8 x 3.52	32'			16.50	14.50	12.50	9.50	2.00	2.00	1.25	7.00	.375	15.00	15.63	10.61	2.00	1.88	9.50	
4	42	37.5	.250	13 x 9.36 x **			38'	.239	10.32 x 7.84 x 17.71'	16.50	14.50	12.50	9.50	2.00	2.00	1.50	8.75	.375	18.00	18.50	12.75	2.00	2.13	11.25	
								.179	8.50 x 5.36 x 22.42'																
12	42	47.5	.3125	14 x 10.36 x **			48'	.3125	11 x 8.52 x 17.71'	16.50	14.50	12.50	9.50	2.00	2.00	1.50	8.75	.375	20.00	20.50	14.13	2.00	2.38	8.75	
								.179	9.19 x 4.64 x 32.51'																
13	40	59.5	.3125	16 x 12.36 x **			60'	.3125	13 x 8.83 x 29.82'	19.50	16.50	15.00	12.00	2.00	2.00	1.50	8.25	.375	22.00	23.00	15.56	2.00	2.38	9.50	
								.239	9.62 x 5.28 x 32.44'																
14	38	69.5	.3125	17 x 13.36 x **			70'	.3125	14 x 8.81 x 37.10'	19.50	19.50	15.00	15.00	2.25	2.25	1.50	9.25	.375	22.00	23.00	15.56	2.00	2.38	9.75	
								.239	9.6 x 4.68 x 35.16'																

NOTES:

A. Maximum design area is based on wind loads with a mean recurrence interval of 1700 years

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

* Required dimension, see Note 2

** See Note 22