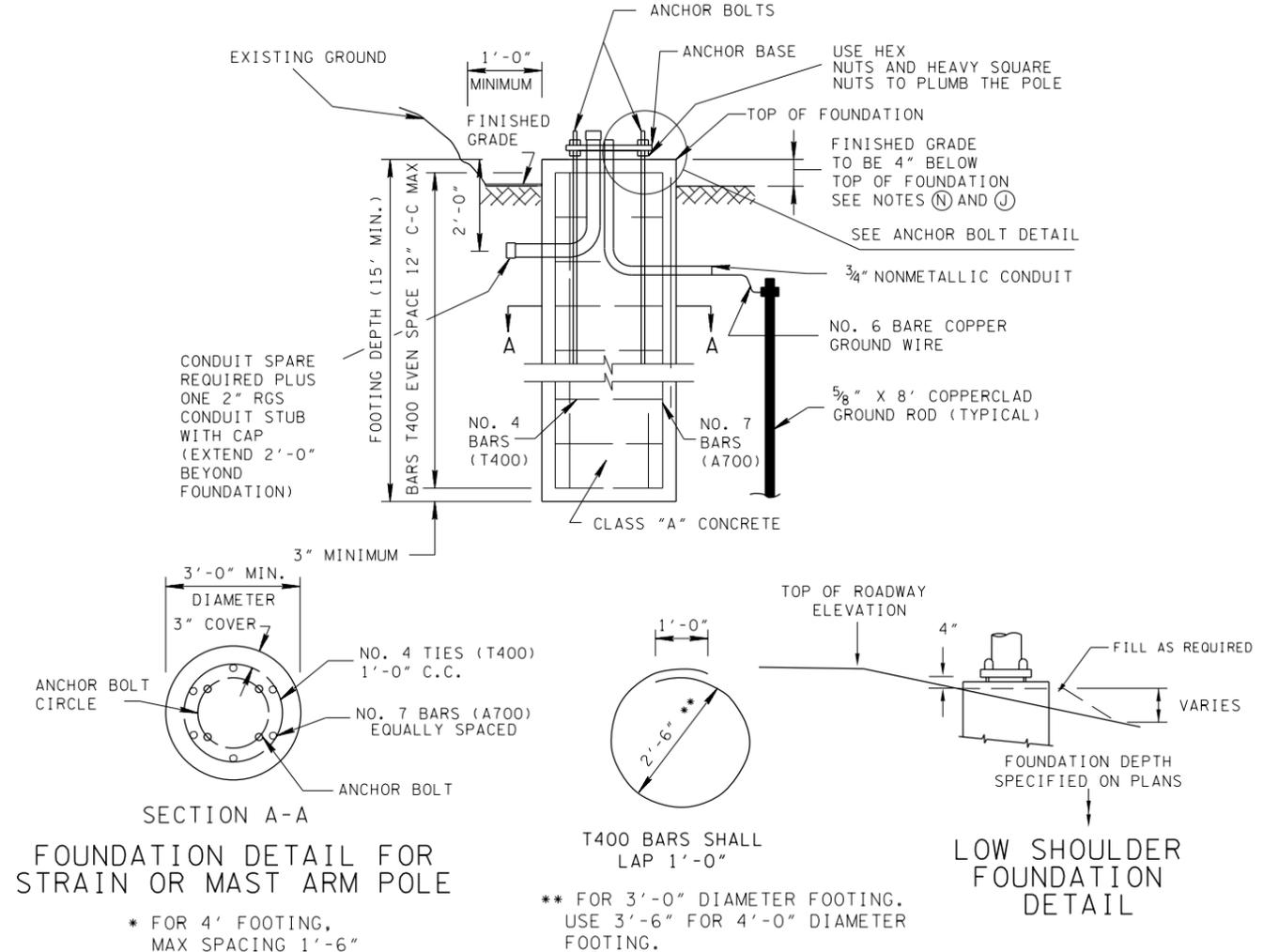
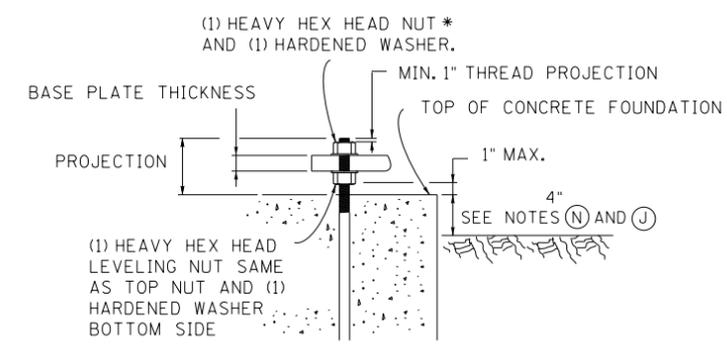


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**FOUNDATION DETAIL FOR STRAIN OR MAST ARM POLE**  
 \* FOR 4' FOOTING, MAX SPACING 1'-6"

\*\* FOR 3'-0" DIAMETER FOOTING, USE 3'-6" FOR 4'-0" DIAMETER FOOTING.



**ANCHOR BOLT DETAIL**

UNDER NO CONDITIONS WILL DRILLED AND GROUTED ANCHOR BOLTS BE ALLOWED (CANTILEVER AND BUTTERFLY SIGN BASES SHALL REQUIRE A MINIMUM OF 8 ANCHOR BOLTS 1 1/2" IN DIAMETER)

\* NOTE: TOP NUT TO BE TORQUED TO PRODUCE 60% YIELD STRESS OF ANCHOR BOLT.  
 NOTE: DO NOT GROUT BETWEEN BOTTOM OF BASE PLATE AND TOP OF CONCRETE FOUNDATION.

REQUIRED BEARING AREA FOR ANCHOR BOLT	
ANCHOR BOLT DIA (IN)	HEAD OR NUT AREA (SQ IN)
1"	1.800
1 1/4"	2.812
1 1/2"	4.050
1 3/4"	5.512
2"	7.199
2 1/4"	9.122
2 1/2"	11.249

ESTIMATED FOUNDATION QUANTITIES									
FOOTING DIAMETER	FOOTING DEPTH	T400 REINFORCING BARS			A700 REINFORCING BARS			CONCRETE (CUBIC YARDS)	MAXIMUM DESIGN MOMENT (FT-KIP) SERVICE LOAD
		NUMBER OF BARS	LENGTH OF EACH BAR	TOTAL WEIGHT IN POUNDS	NUMBER OF BARS	LENGTH OF EACH BAR	TOTAL WEIGHT IN POUNDS		
3'-0"	15'-0"	15	8'-10"	89	8	14'-6"	237	3.9	134
3'-0"	16'-0"	16	8'-10"	95	8	15'-6"	253	4.2	150
3'-0"	17'-0"	17	8'-10"	101	10	16'-6"	337	4.5	167
3'-0"	18'-0"	18	8'-10"	107	10	17'-6"	358	4.7	184
3'-0"	19'-0"	19	8'-10"	113	10	18'-6"	378	5.0	202
3'-0"	20'-0"	20	8'-10"	119	12	19'-6"	478	5.2	221
3'-0"	21'-0"	21	8'-10"	125	12	20'-6"	503	5.5	240
3'-0"	22'-0"	22	8'-10"	130	12	21'-6"	527	5.8	260
3'-0"	23'-0"	23	8'-10"	136	12	22'-6"	552	6.0	280
3'-0"	24'-0"	24	8'-10"	142	14	23'-6"	672	6.3	300
4'-0"	15'-0"	15	12'-0"	121	10	14'-6"	296	7.0	179
4'-0"	16'-0"	16	12'-0"	128	10	15'-6"	317	7.4	200
4'-0"	17'-0"	17	12'-0"	136	12	16'-6"	405	7.9	223
4'-0"	18'-0"	18	12'-0"	145	12	17'-6"	429	8.4	246
4'-0"	19'-0"	19	12'-0"	153	12	18'-6"	454	8.8	270
4'-0"	20'-0"	20	12'-0"	161	14	19'-6"	558	9.3	295
4'-0"	21'-0"	21	12'-0"	169	14	20'-6"	587	9.8	320
4'-0"	22'-0"	22	12'-0"	177	14	21'-6"	615	10.2	346
4'-0"	23'-0"	23	12'-0"	185	16	22'-6"	736	10.7	373
4'-0"	24'-0"	24	12'-0"	193	16	23'-6"	769	11.2	401
4'-0"	25'-0"	25	12'-0"	201	16	24'-6"	801	11.7	429
4'-0"	26'-0"	26	12'-0"	209	18	25'-6"	938	12.1	458
4'-0"	27'-0"	27	12'-0"	217	18	26'-6"	975	12.6	487
4'-0"	28'-0"	28	12'-0"	224	18	27'-6"	1012	13.0	517
4'-0"	29'-0"	29	12'-0"	233	20	28'-6"	1165	13.5	547
4'-0"	30'-0"	30	12'-0"	241	20	29'-6"	1206	14.0	578
4'-0"	31'-0"	31	12'-0"	248	20	30'-6"	1247	14.4	609
4'-0"	32'-0"	32	12'-0"	257	22	31'-6"	1416	14.9	641
2'-0"	6'-0"	7	5'-9"	27	6	5'-6"	67	0.7	(N)

- GENERAL NOTES**
- (A) ALL STEEL STRAIN POLES SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 730 - TRAFFIC SIGNALS.
  - (B) STRAIN POLES SHALL BE DESIGNED ACCORDING TO AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS (CURRENT EDITION).
  - (C) THE CONTRACTOR SHALL FURNISH POLES DESIGNED FOR A WIND VELOCITY ACCORDING TO THE CURRENT STANDARDS AS SPECIFIED IN AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS".
  - (D) ANCHOR BOLTS SHALL BE DESIGNED BY THE POLE FABRICATOR. THEY SHALL BE CAPABLE OF RESISTING THE FULL BENDING MOMENT OF THE SHAFT AT ITS YIELD STRENGTH STRESS.  
 MATERIAL SPECIFICATIONS - BOLTS:  
 1.) ANCHOR BOLTS SHALL BE ASTM F1554 GRADE 55 KSI WITH THREADS CONFORMING TO THE REQUIREMENTS OF ASTM A563.  
 2.) NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A563.  
 3.) ALL HARDWARE, EXCEPT STAINLESS STEEL, SHALL BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A153 OR MECHANICALLY GALVANIZED ACCORDING TO ASTM B695.
  - (E) THE COST OF ALL FOOTING MATERIALS AND INSTALLATION SHALL BE INCLUDED IN THE PRICE BID FOR STEEL POLES.
  - (F) THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND NOTES TO THE ENGINEER OF STRUCTURES FOR APPROVAL PRIOR TO FABRICATION.
  - (G) THE MOMENT CAPACITY OF THE STRAIN POLES AND THE FOOTING DEPTHS FOR BOTH STRAIN POLE AND MAST ARM POLE SHALL BE AS SPECIFIED IN THE PLANS.
  - (H) CANTILEVER SIGNAL SUPPORTS SHALL BE DESIGNED BY THE POLE FABRICATOR.
  - (I) TOP OF FOOTING SHALL BE FLUSH IN SIDEWALK OR PAVED ISLANDS. TOP OF FOOTING SHALL NOT EXTEND MORE THAN 4" ABOVE THE GROUND LINE IN OTHER AREAS.
  - (J) IF ROCK IS ENCOUNTERED WHILE DRILLING FOR FOOTING, AND CORE AND THE DRILLING INDICATES ROCK IS SOLID, THE CONTRACTOR SHALL PROCEED BY ONE OF TWO METHODS. METHOD 1: PROVIDE A ROCK SOCKET TWO TIMES THE DIAMETER OF THE POLE FOUNDATION. METHOD 2: DRILL SIX 1 1/8" DIAMETER HOLES INTO ROCK A MINIMUM DISTANCE OF THREE FEET. FILL HOLES WITH A-B EPOXY MIX AND ROTATE THE A700 BARS UNTIL FULL DEPTH IS ACHIEVED. THE A-B EPOXY MIX SHALL BE APPROVED BY TENNESSEE DEPARTMENT OF TRANSPORTATION, MATERIALS AND TEST DIVISION. GROUND ROD MAY BE PLACED HORIZONTALLY, AS DEEP AS ROCK ALLOWS WITH A 3" MINIMUM SEPARATION FROM ANY CONDUIT. THE CONTRACTOR SHALL CONTACT THE DIVISION OF STRUCTURES TO DETERMINE WHICH METHOD IS APPLICABLE OR WHETHER A SPECIAL SPREAD FOOTING DESIGN MUST BE FURNISHED BY THE DIVISION OF STRUCTURES.
  - (K) ALL STRAIN POLES AND MAST ARM POLES TO HAVE SPARE 2" RGS CONDUIT STUB EXTENDING 24" BEYOND POLE FOUNDATION.
  - (L) ALL CONDUIT BENDS IN POLE FOUNDATION TO BE 6" RADIUS.
  - (M) BASE OF POLE SHALL REMAIN OPEN TO PERMIT DRAINAGE AND AIR CIRCULATION. FINISHED GROUND PROFILE SHOULD DRAIN WATER AWAY FROM FOUNDATION.
  - (N) 2' DIAMETER FOUNDATION ONLY TO BE USED WITH PEDESTAL POLE (SEE T-SG-6).

- REV. 9-18-89: ADDED NOTE (J) AND GRADE DETAILS TO FOOTING DETAIL.
- REV. 1-18-91: REDREW AND REORGANIZED SHEET. ADDED GENERAL NOTE (K) REGARDING FOOTINGS IN ROCK.
- REV. 1-19-96: CHANGED GENERAL NOTE (A).
- REV. 2-14-99: REVISED GENERAL NOTE (K).
- REV. 12-16-03: REVISED SHEET TITLE. DELETED ESTIMATED QUANTITY FOR FOUNDATIONS LESS THAN 10'. ADDED SPARE CONDUIT TO STRAIN OR MAST ARM FOUNDATION DETAIL. ADDED LOW SHOULDER FOUNDATION DETAIL. DELETED NOTE G. RE LETTERED REMAINING NOTES AND ADDED NOTES (L) TO (N).
- REV. 7-29-04: MODIFIED ESTIMATED FOOTING QUANTITIES FOR STRAIN POLE TABLE. ADDED LOWER SHOULDER FOUNDATION DETAIL.
- REV. 02-15-07: ADDED ANCHOR BOLT DETAIL. REVISED GENERAL NOTES (D), (G) & (N) AND CHANGED TITLE.
- REV. 1-5-10: MODIFIED ESTIMATED FOUNDATION QUANTITIES TABLE.
- REV. 5-6-13: MODIFIED ESTIMATED FOUNDATION QUANTITIES, T400 BARS, GENERAL NOTES AND FOUNDATION DETAILS.
- REV. 12-4-13: CHANGED ANCHOR BOLTS TO THREADED. ADDED BEARING AREA TABLE.
- REV. 6-11-14: ADDED 2' DIA FOUNDATION FOR PEDESTAL POLES. ADDED NOTES (N).
- REV. 6-27-16: CORRECTED SPELLING ERRORS IN GENERAL NOTES AND REVISED NOTE (N). REVISED FOOTING DETAIL FOR STEEL PEDESTAL POLE AND MOVED IT TO T-SG-6. ADDED NOTE TO SECTION A-A FOR SPACING OF NO. 7 BARS.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION

MAST ARM POLE AND STRAIN POLES FOUNDATION DETAILS  
 BEFORE 9-18-89 T-SG-10