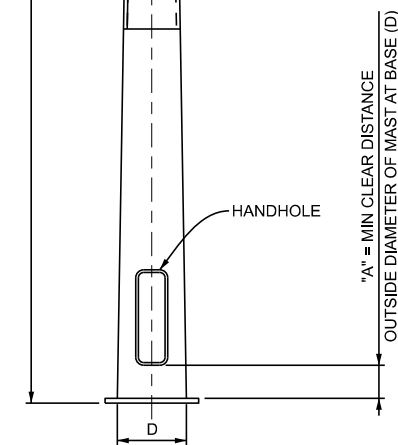
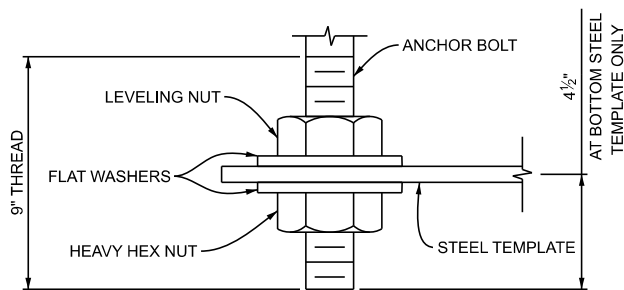


DETAIL 2 - FOUNDATION ELEVATION



DETAIL 1 - TOWER LIGHTING UNIT



4 NUTS AND 4 WASHERS PER ANCHOR BOLT ARE REQUIRED.

DETAIL 3 - ANCHOR BOLT WASHER PLACEMENT

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
TOWER LIGHTING UNIT FOUNDATION

(SPECIAL DETAIL)  
FHWA APPROVAL

02/21/2025  
PLAN DATE

R-135-A

SHEET  
1 OF 4

**TABLE 1: TOWER LIGHTING UNIT FOUNDATION**

TOWER LIGHTING UNIT HEIGHT (FT)	FOUNDATION DIAMETER (FT)	FOUNDATION LENGTH (FT) **					
		SOIL TYPE					
		N60 *			SU *		
		LOW SAND	MED SAND	HIGH SAND	LOW CLAY	MED CLAY	HIGH CLAY
		$5 \leq N60 < 10$	$10 \leq N60 < 20$	$N60 \geq 20$	$400 \leq SU < 1000$	$1000 \leq SU < 2000$	$SU \geq 2000$
80	4	19.5	16	14.5	16	12	10.5
90	4	20.5	16.5	15	17.5	12.5	10.5
100	4	21	17	15.5	19	13.5	11
110	4	21.5	17.5	16	20.5	14	11.5
120	4.5	23	18.5	17	22	15.5	12.5
130	4.5	23.5	19	17.5	23.5	16	13
140	4.5	24	19.5	18	25	17	13.5
150	5	25.5	20.5	18.5	26.5	18	15
160	5	26	21	19	28.5	19	15.5

\* SU = UNDRAINED SHEAR STRENGTH IN COHESIVE SOIL (PSF)

\* N60 = STANDARD PENETRATION RESISTANCE (BLOWS/FOOT ACCORDING TO ASTM D-1586) CORRECTED TO 60% HAMMER EFFICIENCY UTILIZING THE HAMMER'S CALIBRATED ENERGY

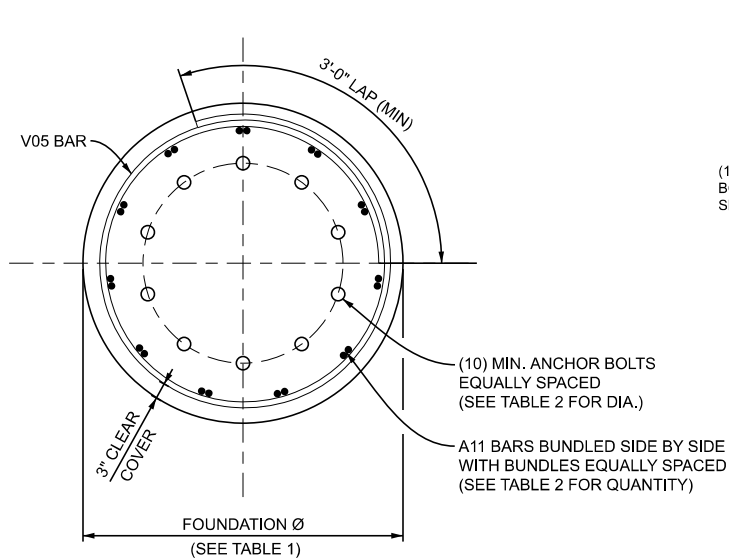
\*\* FOUNDATION LENGTH MEASURED AS SHOWN IN DETAIL 2 ON SHEET 1

**TABLE 2: ANCHOR BOLT AND REINFORCEMENT**

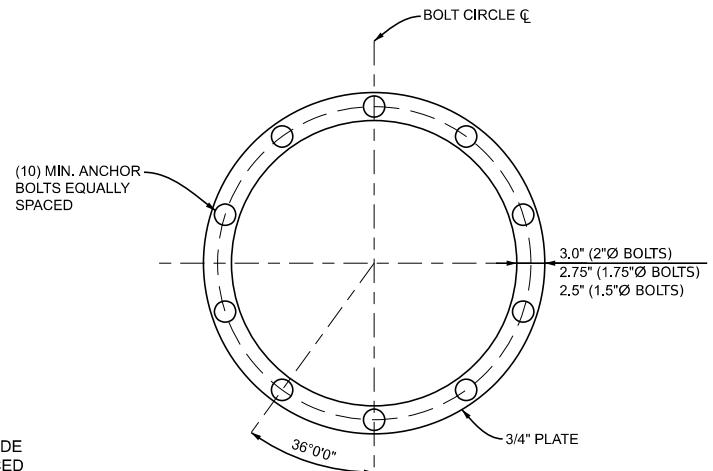
TOWER HEIGHT (FT)	80	90	100	110	120	130	140	150	160
ANCHOR BOLT DIA (IN)	1 1/2	1 3/4	1 3/4	2	2	2	2	2	2
BOLT CIRCLE DIA (IN)	30	30	30	30	36	36	36	38	38
A11 BAR TOTAL QTY *	18	18	18	18	20	20	20	22	22

ANCHOR BOLT QUANTITY, DIAMETER, AND LENGTH SHOWN ARE MINIMUMS. FINAL ANCHOR BOLT QUANTITY, DIAMETER, LENGTH, AND BOLT CIRCLE ARE THE RESPONSIBILITY OF THE TOWER MANUFACTURER.

\* PLACED IN BUNDLES OF 2 BARS PER BUNDLE



**SECTION A-A - FOUNDATION PLAN**



**DETAIL 5 - ANCHOR BOLT STEEL TEMPLATE**



**DETAIL 4 - VERTICAL A11 BARS**

ENSURE BOLT HOLES IN THE TEMPLATES HAVE A DIAMETER 1/16" LARGER THAN THE ANCHOR BOLT DIAMETER.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

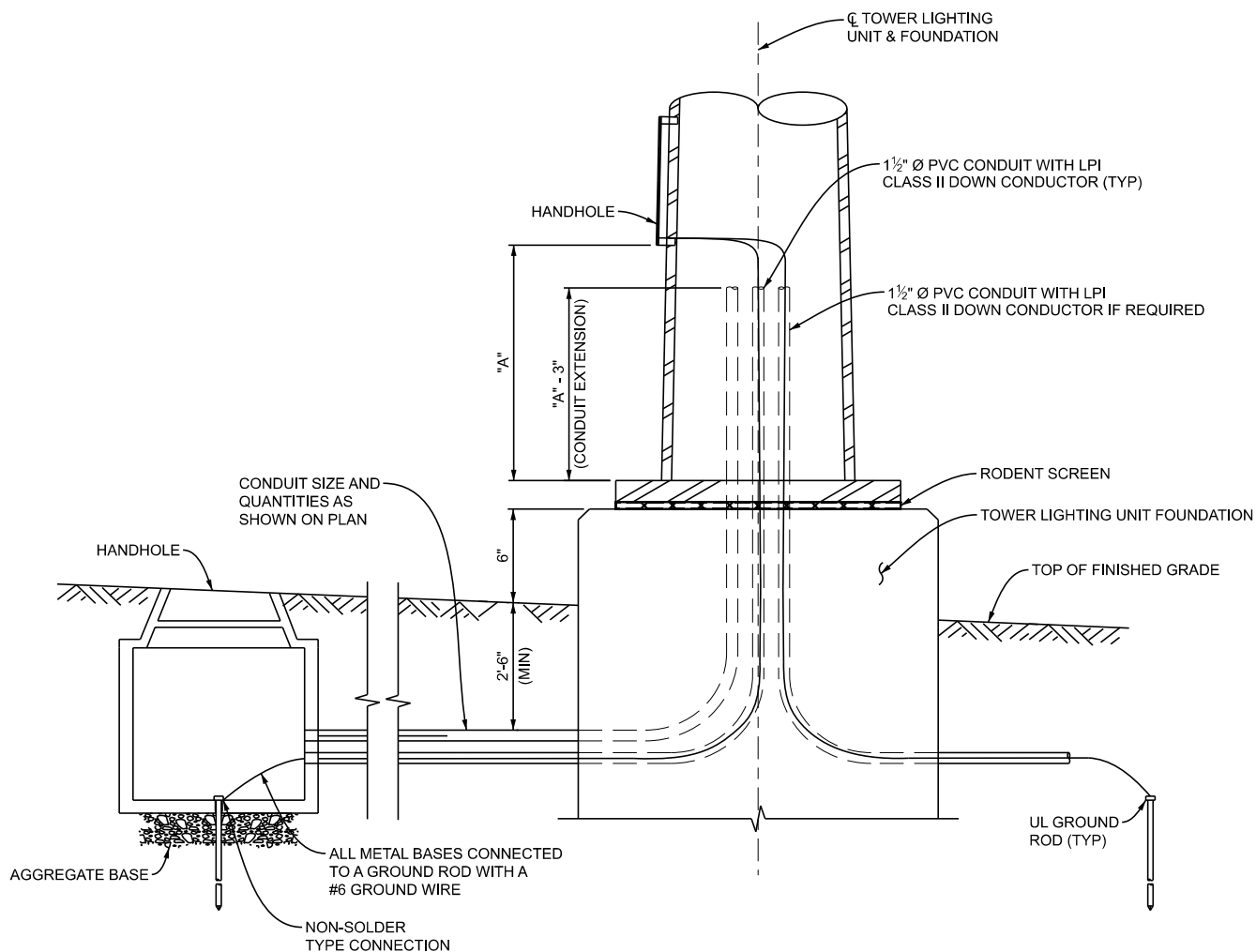
STANDARD PLAN FOR  
TOWER LIGHTING UNIT FOUNDATION

(SPECIAL DETAIL)  
FHWA APPROVAL

02/21/2025  
PLAN DATE

**R-135-A**

SHEET  
2 OF 4



DETAIL 6 - CONDUIT LAYOUT



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
TOWER LIGHTING UNIT FOUNDATION

(SPECIAL DETAIL)  
FHWA APPROVAL

02/21/2025  
PLAN DATE

R-135-A

SHEET  
3 OF 4

TABLE 3: FOUNDATION DESIGN LOADS				
TOWER HEIGHT	COMBINATION	AXIAL LOAD (KIPS)	HORIZONTAL LOAD (KIPS)	MOMENT (KIP-FT)
80 FT	STRENGTH	8.25	0.00	0.00
	SERVICE	6.60	1.06	53.53
	EXTREME	7.26	2.65	133.68
90 FT	STRENGTH	9.13	0.00	0.00
	SERVICE	7.31	1.19	66.54
	EXTREME	8.04	2.97	165.51
100 FT	STRENGTH	10.90	0.00	0.00
	SERVICE	8.72	1.32	80.72
	EXTREME	9.59	3.29	200.80
110 FT	STRENGTH	11.38	0.00	0.00
	SERVICE	9.11	1.45	96.81
	EXTREME	10.01	3.62	241.40
120 FT	STRENGTH	11.86	0.00	0.00
	SERVICE	9.49	1.58	112.90
	EXTREME	10.43	3.94	281.99
130 FT	STRENGTH	12.65	0.00	0.00
	SERVICE	10.12	1.72	131.60
	EXTREME	11.13	4.27	327.81
140 FT	STRENGTH	13.48	0.00	0.00
	SERVICE	10.78	1.86	152.01
	EXTREME	11.86	4.61	377.66
150 FT	STRENGTH	14.51	0.00	0.00
	SERVICE	11.61	1.99	173.04
	EXTREME	12.77	4.96	431.67
160 FT	STRENGTH	15.30	0.00	0.00
	SERVICE	12.24	2.12	195.59
	EXTREME	13.46	5.30	488.62

THE TOWER LIGHTING UNIT FOUNDATION DESIGN IS BASED ON THE LOADS SHOWN IN THIS TABLE. SEE SPECIAL PROVISION FOR REQUIREMENT TO COMPARE TOWER MANUFACTURER BASE REACTIONS AGAINST THESE LOADS.