

FED. RD. DIV.	STATE	PROJECT	FISCAL YEAR
5	OHIO		



FOUNDATIONS

SLOPE - THE TOP OF FOUNDATIONS SHALL BE SLOPED TO MEET EXISTING SIDEWALK. AT LOCATIONS WITHOUT SIDEWALKS, THE FOUNDATION SHALL BE GROOVED TO DRAIN.

TIE LOOPS SHALL BE WELDED EITHER INTO A RING DEVELOPING THE FULL STRENGTH OF THE BAR OR OVERLAP FOR 12". VERTICAL SPACING ON ALL LOOPS 12" C/C EXCEPT AT TOP.

(R) FOUNDATION CONDUIT - MINIMUM RADIUS OF BEND INSTALLED IN FOUNDATION SHALL BE 24" INCHES. CONDUIT SHALL BE PLACED TO CENTER OF ANCHOR BOLTS. CONDUIT THAT LEAVES FOUNDATION UNDER PAVEMENT SHALL BE A MINIMUM OF 24" BELOW PAVEMENT.

(F) ALL CONDUIT PLACED IN FOUNDATIONS SHALL BE 3" PVC, TYPE DB, UNLESS OTHERWISE SPECIFIED ON THE PLANS. THE CORRECT NUMBER AND SIZE CONDUIT SHALL BE INSTALLED IN THE FOUNDATION FOR PROPER CONNECTION TO EXTERNAL CONDUIT RUNS SPECIFIED ON THE PLANS.

WHERE A POLE AND FOUNDATION ARE INSTALLED, AND IT IS NOT INDICATED TO CONNECT TO ANY UNDERGROUND CONDUIT SYSTEM, A 3" PVC CONDUIT SHALL BE PLACED IN THE BASE AS SHOWN IN THE DETAILS, AND THE CONDUIT SHALL BE PLUGGED WITH A NON-SETTING COMPOUND.

INSTALL ADDITIONAL 3/4" PVC SCHEDULE 40 FOR CONNECTING GROUND WIRE FROM POLE TO GROUND ROD.

REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF 709.01 & SHALL BE DEFORMED AND PLAIN BILLET STEEL BARS FOR CONCRETE REINFORCEMENT.

(E) EXPANSION JOINTS SHALL BE 1/2" PREFORMED JOINT FILLER 705.03 AND SHALL BE PROVIDED BETWEEN FOUNDATIONS AND ABUTTING PAVED AREAS AND PULLBOXES.

GROUND RODS SHALL BE COPPER CLAD (BONDED COPPER TO STEEL) HIGH STRENGTH STEEL, 1 INCH DIA. x 10 FEET LONG. GROUND CABLE GROUNDING POLE TO GROUND ROD SHALL BE No. 4 AWG STRANDED COPPER CABLE WITH RHH/RHW/USE OR TYPE UF, 600 VOLT INSULATION. USE GROUND ROD CLAMP OR EXOTHERMICALLY WELD COPPER GROUND CABLE TO GROUND ROD.

TYPICAL GROUND ROD INSTALLATION METHODS

- (G1) ADJACENT TO FOUNDATION
- (G2) IN BOTTOM OF PULLBOX
- (G3) IN BOTTOM OF FOUNDATION

PAYMENT FOR GROUND RODS SHALL BE PER ITEM 625 (ODOT) OR 1320 (CITY OF CINCINNATI) PER CONTRACT SPECS.

ANCHOR BOLTS
ANCHOR BOLTS ARE FURNISHED WITH POLES AND PAYMENT WILL BE MADE UNDER THE ITEM FOR SIGNAL OR LIGHTING POLES BUT INSTALLED WITH CONSTRUCTION OF FOUNDATION. WHERE POLE INSTALLATION SPECIFIED TO BE MADE BY OTHERS, ANCHOR BOLTS WILL BE FURNISHED BY OTHERS FOR FOUNDATION CONSTRUCTION.

STAKING SHALL BE PROVIDED BY THE CONTRACTOR, OR OTHERS, AS SPECIFIED ON THE PLANS. WHERE NO SURVEY STATION REFERENCE OR DIMENSIONS ARE PROVIDED IN THE PLANS, THE CITY WILL PROVIDE STAKING.

RAKING
PAYMENT FOR RAKING AND LEVELING SHALL BE INCIDENTAL TO INSTALLATION OF POLES.



POLES, SUPPORTS, AND FOUNDATIONS (ES - 1)

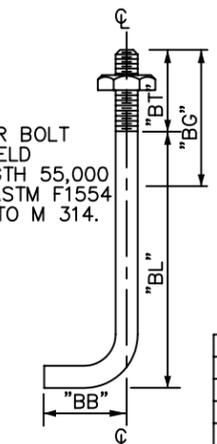
ANCHOR BASE POLE FOUNDATIONS

CITY OF CINCINNATI
DEPT. OF TRANSPORTATION & ENGINEERING
DIV. OF TRAFFIC ENGR.

DESIGN	REVISION	DATE	NO #	SCALE	SOURCE	DRAWN	FILE NO.
S.C.H.		7/19/04					
T.E.		3/1/98					
R.R.R.	APPROVED	11/1/90			4/27/88	CDS ASSOCIATES	ES-1-1

ANCHOR BOLTS

ANCHOR BOLT
MIN. YIELD STRENGTH 55,000 P.S.I. ASTM F1554 /AASHTO M 314.



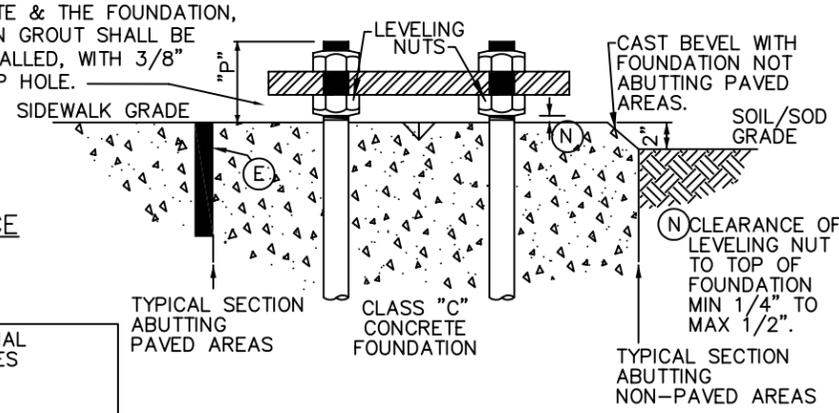
ANCHOR BOLT DIMENSIONS (INCHES)

BOLT SIZE	"BB"	"BL"	"BT"	"BG"
1"x40"	4	30	6	8
1 1/2"x60"	6	45	9	11
1 3/4"x90"	6	75	9	11
2"x96"	6	80	10	12

NOTE: GALVANIZING "BG" (THREAD LENGTH) + 1" TO 4". LEVELING NUTS, ANCHOR NUTS, & LEVELING SHIMS SHALL BE GALVANIZED PER ASTM A-153. ANCHOR NUTS, & LEVELING NUTS SHALL CONFORM TO ASTM A-563, GRADE A.

LEVELING SHIMS SHALL HAVE A MIN. 10,000 LB. BREAKING STRENGTH. ANCHOR BOLTS SHALL BE "L" SHAPED.

TYPICAL ANCHOR BASE AND BOLT INSTALLATION SECTION



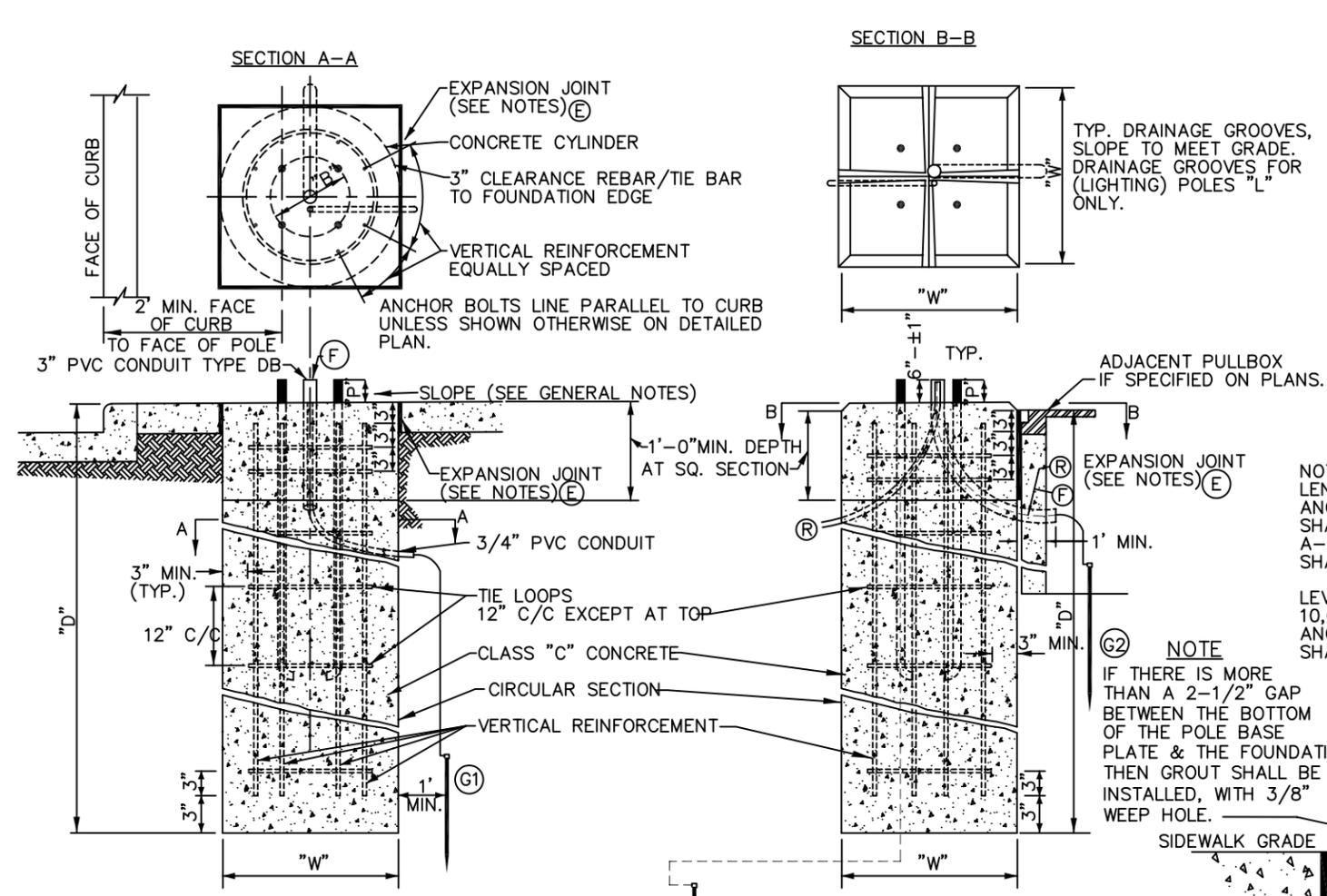
USE OF LEVELING NUTS

- ITEM 1.
- A. TURN LEVELING NUT ON EACH BOLT.
 - B. PLACE POLE IN POSITION ON LEVELING NUTS
 - C. TURN TOP NUTS INTO PLACE LOOSELY.
 - D. LEVEL POLE BY ADJUSTING BOTH UPPER & LOWER NUTS.
 - E. RAKE POLE AS SPECIFIED TO COMPENSATE FOR LOADED DEFLECTION.
- ITEM 2.
- A. APPLY LOAD, READJUST RAKE OF POLE, IF NEEDED. PROPERLY ADJUSTED RAKE WILL PROVIDE A VERTICAL PLUMB LINE FROM CENTER TOP OF POLE TO CENTER OF BASE.

RAKE (IN.)	POLE SIZE AT BASE (IN.)
5	7.8
6	9.10
7	11.12

NOTE

ANY POLE WITH A GAP BETWEEN THE POLE BASE AND THE FOUNDATION, GREATER THAN 2-1/2" WILL NEED TO BE GROUTED.



ANCHOR BASE FOUNDATION ADJACENT TO CURB

ANCHOR BASE FOUNDATION SURROUNDED BY SOIL AT SURFACE

ANCHOR BASE POLE & FOUNDATION DATA

FOUND-ATION DESIGN NUMBER	POLE SIZE GAUGE x BASE (INCHES) x LENGTH (FEET)	ANCHOR BOLT DIMENSIONS			FOUNDATION DIMENSION		REINFORCING STEEL		CONCRETE FOR FOUNDATION CU. YD.	STANDARD POLE DRAWING REFERENCE	SPECIAL NOTES
		BOLT SIZE	BOLT CIRCLE "B"	BOLT PROJECT "P"	DEPTH "D"	WIDTH "W"	VERT. REBAR NO 8	TIE LOOPS NO 4			
FDN-1	11 GA.x7.5x25	10 1/2			7	2	8	8	0.85	ES-10-4	
FDN-2	11 GA.x8x30	11	2 5/8							ES-10-3, ES-10-4	
FDN-3	11 GA.x9x30	12 1/2	3		8	2	8	9	0.96	ES-10-3	
FDN-3	11 GA.x9x35	12 1/2	3		8	2	8	9	0.96	ES-10-4	
FDN-4	11 GA.x9.5x40	13 1/2	3 1/8							ES-10-4	
FDN-5	11 GA.x10x33 1/2	13 3/8	3 3/8		8	2 1/2	8	9	1.50	ES-10-3	
FDN-6	7 GA.x11x21	15	5 1/2		9	3	8	10	2.43		
FDN-7	0 GA.x9x26/28	12 1/2	5 1/4		10	2 1/2			1.87	ES-10-1	MAINT. POLES
FDN-8		1 1/2 x 60									
FDN-9	0 GA.x10x26	13 1/2	5 3/4		10	3	8	11	2.69	ES-10-1	ODOT DESIGN #3 TC-81.10
FDN-9	0 GA.x10x28	13 1/2	5 3/4		10	3	8	11	2.69	ES-10-1	
FDN-10	3X3 GA.X9X35	15	6							ES-10-4	
FDN-10	0 GA.x11x30	1 3/4 x 90			11	3	8	12	2.95	ES-10-1, ES-10-3	
FDN-11	3 GA.x13x21	18	6 1/2								
FDN-12	7x7 GA.x12x30	2x96	18	7	12	3	8	13	3.21	ES-10-1	ODOT DESIGN #7 TC-81.10
FDN-12	0 GA.x13x33 1/2	2x96	18	7	12	3	8	13	3.21	ES-10-3	
FDN-13	3X3 GA.13"x34	2 1/4 x 96	22	7 1/4						ES-10-1, ES-10-3	ODOT DESIGN #10 TC-81.10

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NOTES

WOOD POLES SHALL BE IN ACCORDANCE WITH ANSI STANDARD 05.1 WITH ANY EXCEPTIONS INDICATED IN THE SPECIFICATION.

WOOD POLES SHALL BE SOUTHERN PINE SPECIES WITH A MINIMUM FIBER STRESS OF 8000 PSI.

POLE CLASS	1	2	3	4	5
BREAKING LOAD (LBS)	4500	3700	3000	2400	1900

MAXIMUM ALLOWABLE STATIC LOAD (LBS)(STRINGING TENSION)=
 $\frac{\text{BREAKING LOAD}}{4} \times \frac{L_1}{L_2}$ AT ANY POINT ON THE POLE (L2) W/GUY
 $\frac{\text{BREAKING LOAD}}{6} \times \frac{L_1}{L_2}$ AT ANY POINT ON THE POLE (L2) W/O GUY

* POLE MAY BE REQUIRED W/ STRUT GUY ANCHOR ROD & ACCESSORIES TO ACCOMMODATE FUTURE ADDITIONAL LOADING AND SHALL BE SPECIFIED ON THE PLANS.

D DEPTH OF EMBEDMENT (FT.)	5	6	6	7	7
Lo OVERALL LENGTH OF POLE (FT.)	25	30	35	40	45

L0 - OVERALL LENGTH OF POLE
L1 - MAX. HGT. OF LOAD POINT (2' FROM TOP)
L2 - HGT. OF LOAD ABOVE GROUND OTHER THAN AT MAX. LOAD POINT

① GROUND WIRE - THE GROUND WIRE SHALL BE INSTALLED AS FOLLOWS:
a.) MILLING OR SAWING A 1/4" x 1/4" KEY SLOT IN THE FACE OF THE POLE. THE SLOT SHALL BE IN THE ENTIRE LENGTH OF THE POLE, & SHALL BE 90° FROM THE BRAND.

b.) INSTALL A 1/4" BRASS OR #4 AWG. INSULATED SOLID COPPER GROUND WIRE IN THE ENTIRE LENGTH OF THE POLE/SLOT WITH AT LEAST 3 FT. OF SLACK TO CONNECT TO THE EXTERNAL GROUND ROD. SECURE WITH COPPER STAPLE TWO (2) FEET C/C.

② POLE BRAND - POLES SHALL BE BURN-BRANDED LEGIBLY & PERMANENTLY ON THE FACE & ON THE BUTT. THE BRAND ON THE FACE OF THE POLE SHALL BE LOCATED 12' + 1" FROM THE BUTT END WITH THE LOWEST SECTION OF THE BRAND AS THE REFERENCE POINT.

THE BRAND SHALL CONTAIN:
1. THE SUPPLIER'S CODE OR TRADEMARK
2. PLANT LOCATION & YEAR OF TREATMENT
3. CODE LETTERS DENOTING THE POLE SPECIES & PRESERVATIVE USED
4. THE TRUE CIRCUMFERENCE, CLASS, NUMERICAL, & NUMERALS SHOWING THE LENGTH OF THE POLE.
INSTALL POLE WITH BRAND FACING STREET.

③ GUYING - INSTALL ANCHOR FIRST. STRETCH GUY WIRE TIGHT TO TIGHTEN & PLUMB POLE AFTER SIGNAL/SIGN LOAD. ORIENTATION & LOCATION (DISTANCE IN FEET FROM POLE), OF GUY ANCHOR SHALL BE AS SPECIFIED ON THE PLANS. INSTALL ANCHOR & GUARDS ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND AS SHOWN ON THE DETAILS.

④ GUY WIRE SHALL BE MIN. 5/16" (7#10) COPPER COVERED STEEL MESSENGER WIRE PER ASTM A460.

⑤ SECURE CABLE AS SHOWN WITH A 3-BOLT HOT-DIPPED GALV. STL. SUSPENSION CLAMP FOR 1/4" TO 3/8" GUY WIRES & WITH 1/2" HIGH STRENGTH TRACK BOLTS. CLAMP SHALL BE RATED TO HOLD 25,000# CABLE STRAIN. SERVE CABLE ENDS INTO A 5" TO 7" MAUSS. CABLE CLAMP IS TEMPORARY AND IS TO BE REMOVED AFTER MAUSSING OF CABLE ENDS IS COMPLETE. WHERE A STRUT GUY IS SPECIFIED, INSTALL POLE STRUTS AT 1/3 DISTANCES TO POINT OF LOAD. MAINTAINING MIN. 8" CLEARANCE OF LOWER STRUT TO GRADE.

FOUNDATIONS SHALL BE CONSTRUCTED CLASS "C" CONCRETE COLLARS 2" THICK SHALL BE POURED AT THE BOTTOM OF THE FOUNDATION & AT 6" UNDER GRADE. BACKFILL BETWEEN COLLARS WITH EXCAVATED MATERIAL. BACKFILL IN LAYERS OF 6" & TAMP TO PREVENT SETTLEMENT & VOIDS BETWEEN COLLARS. PROVIDE 6" OF COVER OVER FOUNDATION COLLAR. COVER SHALL BE CLASS "C" CONC. IN SIDEWALK AREAS; SOD IN GRASS AREAS; OR EXCAVATED MATERIAL IN UNSODDED AREAS. WHERE A STRUT GUY IS SPECIFIED, THE FOUNDATION SHALL BE BACKFILLED ENTIRELY WITH CLASS "C" CONCRETE.

POLES, SUPPORTS, & FOUNDATION (ES-1)

WOOD POLES INSTALLATION & GUYING

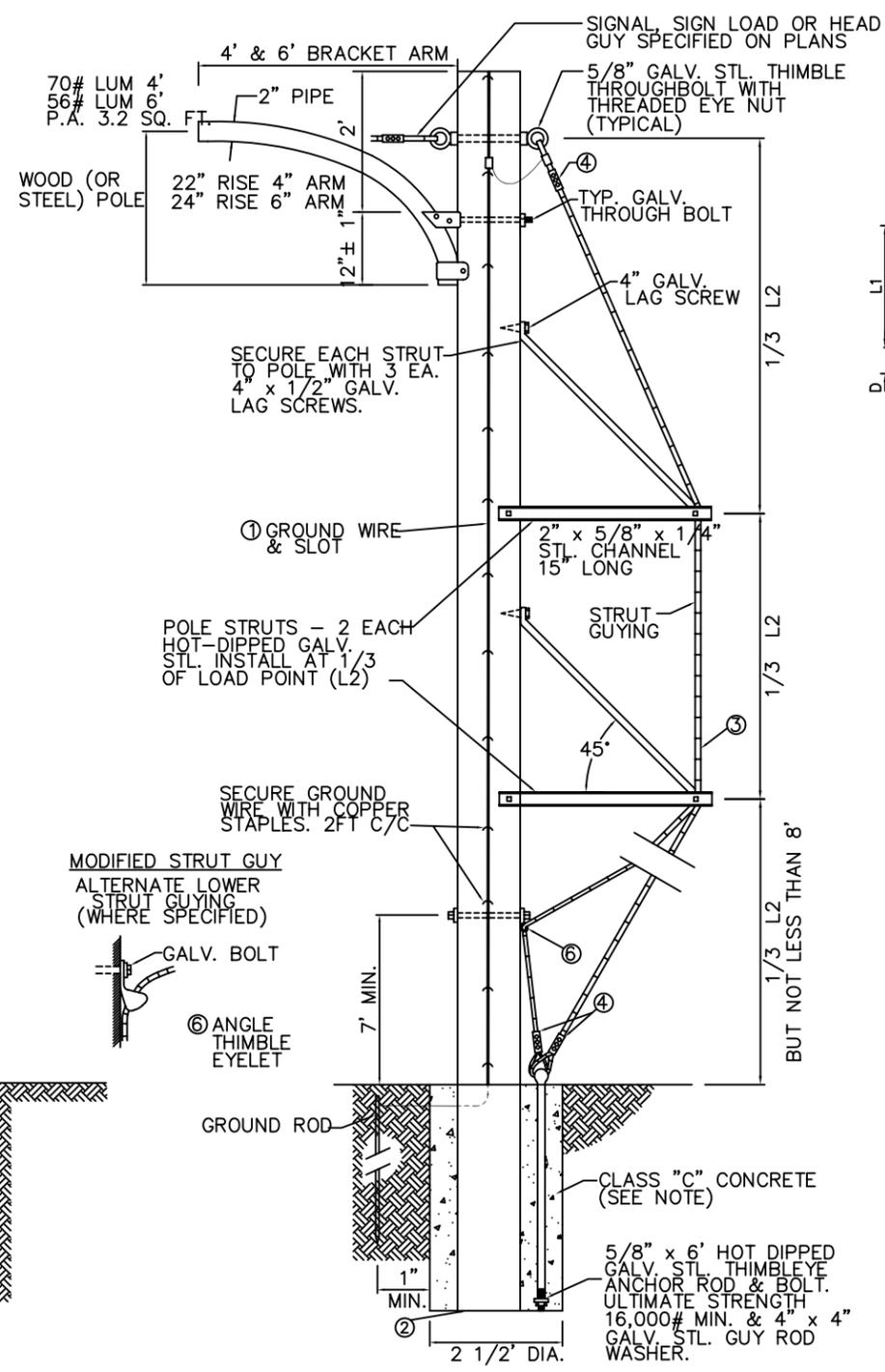
CITY OF CINCINNATI
DEPT. OF TRANSPORTATION AND ENGINEERING
DIV. OF TRAFFIC ENGR.

APPROVED: *Steve Bailey* DATE: 3-4-99

DESIGN	REVISION	DATE	NO #	SCALE	SOURCE	DRAWN	FILE NO.
S.C.H.		7/14/04					
T.E.		3/1/98					
R.R.R.	APPROVED	6/92		ES-1-7 REDRAWN		J.C.A.	ES-1-4

ALUMINUM LIGHTING BRACKET ARM

UPSWEEP STYLE (WHERE SPECIFIED)



TYPICAL WOOD POLE INSTALLATION

(SHOWN WITH STRUT GUY)

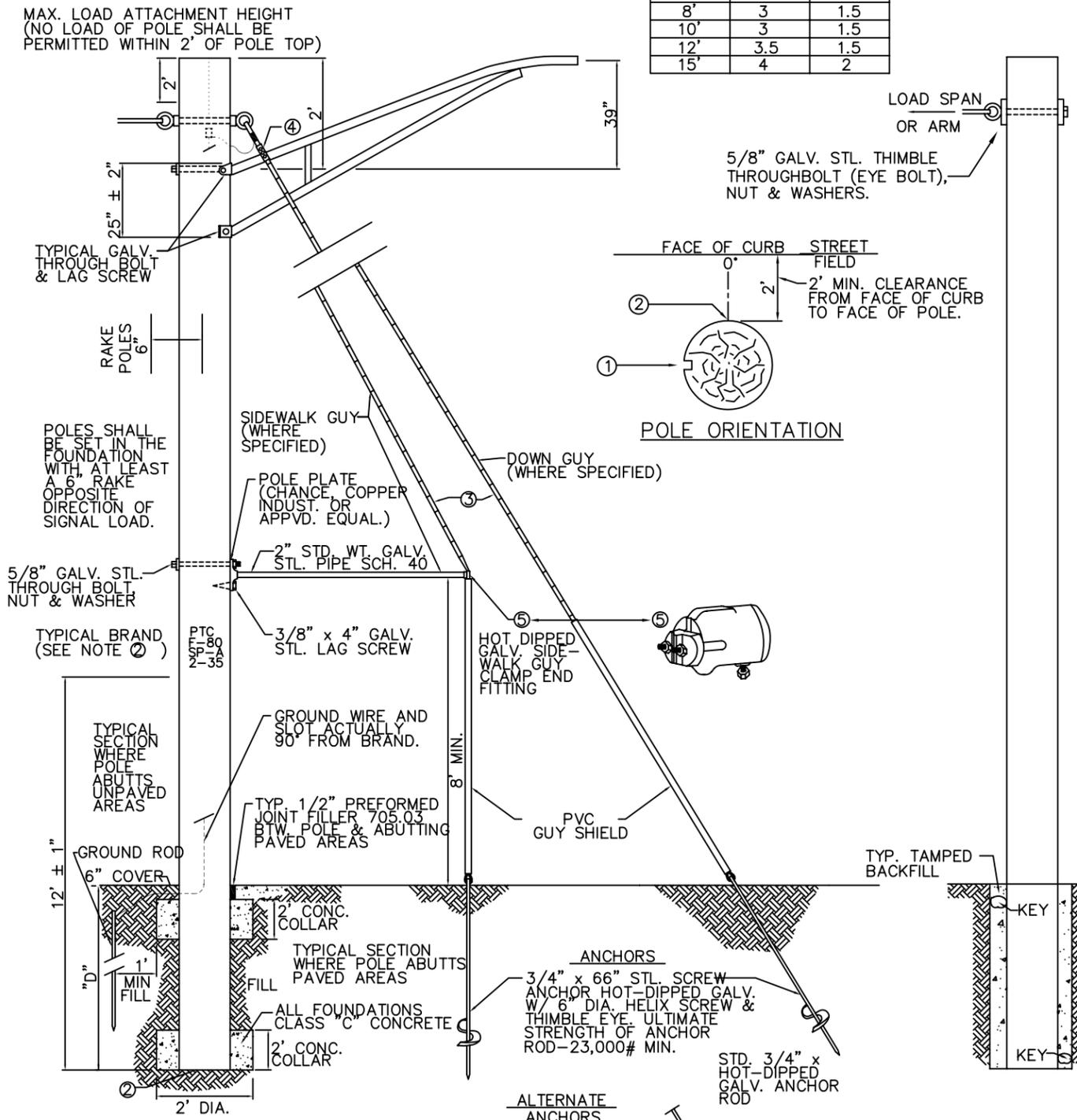


75# LUM.
P.A. 3.2 SQ. FT.

LENGTH	MEMBER SIZE	
	UPPER TUBE	LOWER PIPE
8'	3	1.5
10'	3	1.5
12'	3.5	1.5
15'	4	2

ALUMINUM LIGHTING BRACKET ARM

TAPERED TRUSS STYLE (WHERE SPECIFIED)



TYPICAL WOOD POLE INSTALLATION

(SHOWN WITH A DOWN GUY & A SIDEWALK GUY)

TEMP POLE INSTALLATION

KEY MAY BE ONE OR TWO SACKS OF SAKRETE DUMPED INTO HOLE AND STILL INTACT IN BAGS. PUNCH HOLES IN TOP OF BAGS TO ALLOW WATER ENTRY AND CONCRETE TO SET UP. WATER SHOULD BE DUMPED ON SACKS WHEN INSTALLED. NUMBER OF SACKS WILL DEPEND ON LOAD AND WILL BE DIRECTED BY THE ENGINEER.

"DEAD MAN ANCHOR" MIN. 4' LONG BY 1-0 DIA. TREATED WOOD STUB POST OR STEEL PIPE.
GALVANIZED CROSS PLATE ANCHORS MAY BE USED AS AN ALTERNATE ANCHOR AND SHALL BE COATED WITH BLACK ASPHALTUM PAINT. ALTERNATE ANCHORS SHALL BE APPROVED BY THE ENGINEER.

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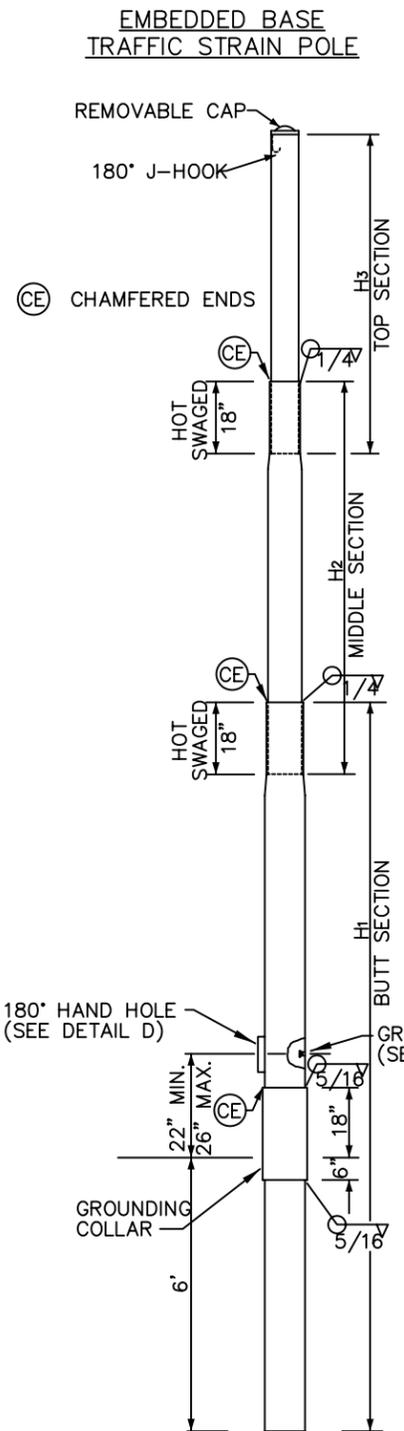
TUBULAR - TWO OR THREE SECTION - STEEL POLES

THE SHAFTS SHALL BE ASSEMBLED FROM TWO OR THREE SECTIONS OF OPEN-HEARTH, GRADE "B", BLK. STEEL PIPE, ASTM A-53, (OR ASTM A-252, GRADE 2) WITH A MINIMUM OF 50,000 PSI YIELD STRESS, ASTM A-36 STEEL PIPE WITH A MINIMUM 36,000 PSI* YIELD STRESS. THE PIPE SECTIONS SHALL BE STD. WGT., SCH. 40 PIPE. WHERE EXTRA STRENGTH POLES ARE SPECIFIED, SCH. 80 PIPE SHALL BE USED FOR THE BUTT SECTION OF THE POLE.

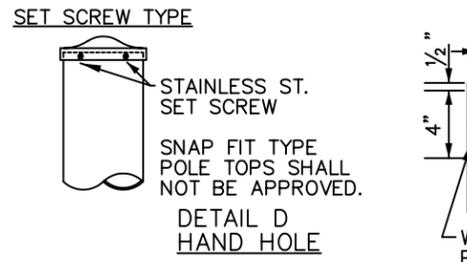
THE SECTIONS SHALL BE LOCKED TOGETHER BY SWAGING OR OTHER APPROVED METHOD SO AS TO PREVENT "TELESCOPING" WHEN POLE IS UNDER MAXIMUM DESIGNED COLUMN LOADS OR FROM DROP TESTING. THE OUTSIDE DIAMETER OF THE ASSEMBLED POLE SHALL HAVE TRUE ALIGNMENT. THE SMALLER PIPE SHALL BE INSERTED IN THE LARGER PIPE FOR A DISTANCE OF 18 IN., AND THE FINAL JOINT SHALL BE WATERPROOF. THE POLE SHALL HAVE A WATERTIGHT GROUND COLLAR OF 3/8" STEEL, MIN. THE SHAFTS SHALL BE CAPABLE OF WITHSTANDING SPECIFIED LOADS APPLIED 18" FROM THE TOP OF THE SHAFT WITHOUT EXCEEDING THE INDICATED DEFLECTION, MEASURED IN INCHES, AND WITHOUT PERMANENT SET, CRACKS, BREAKS, OR OTHER INDICATIONS OF POLE FAILURE.

THE EXTERIOR OF THE POLE SHALL RECEIVE A MINIMUM OF ONE COAT OF A ZINC DUST PRIMER. THE PRIMER SHALL BE A SOYA-ALKYD PRIMER WITH AT LEAST 60% PIGMENT BY WEIGHT BEING ZINC DUST. THE PRIMER SHALL BE A MANUFACTURER'S REGULAR STOCK ITEM.

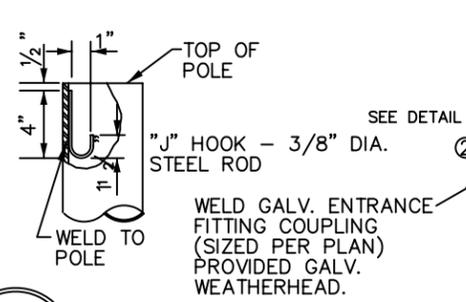
* YIELD STRESS AFTER GALVANIZING.



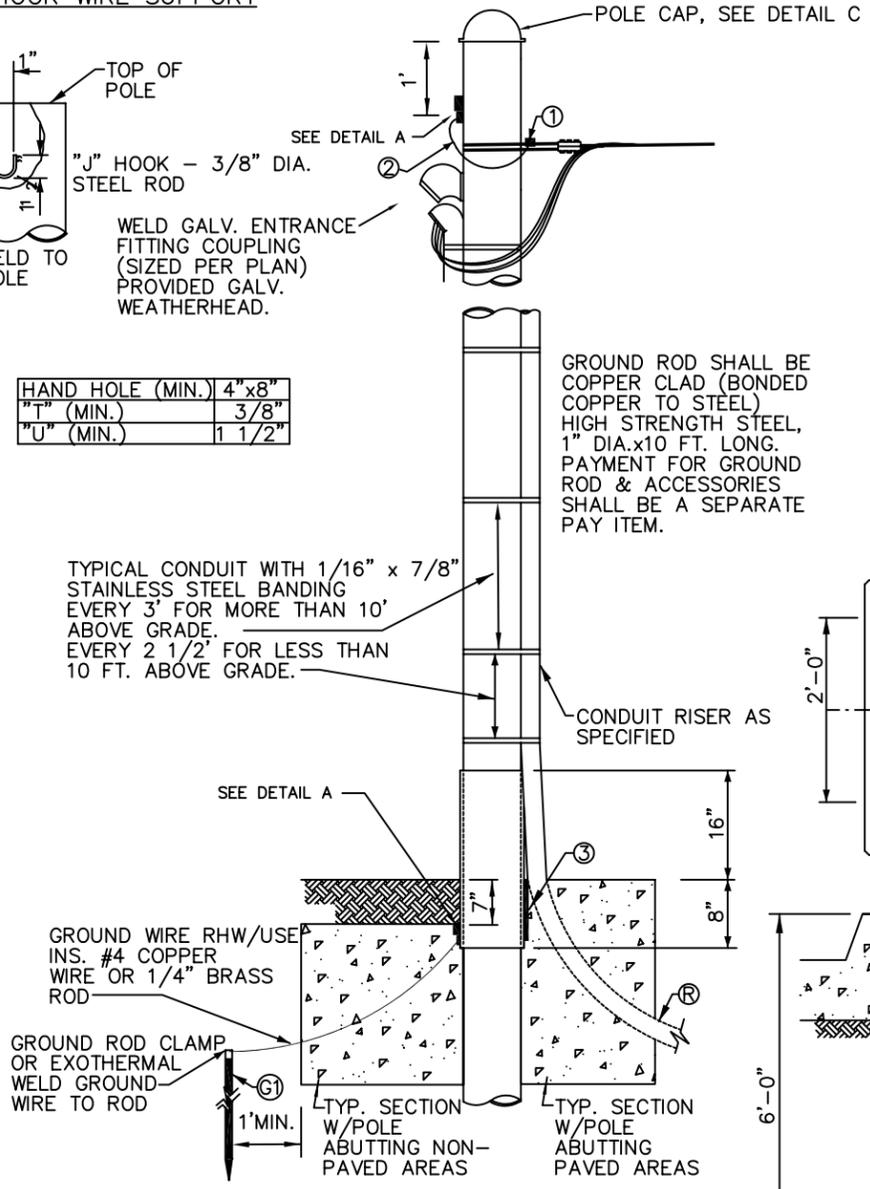
DETAIL C REMOVABLE POLE TOP



"J" HOOK WIRE SUPPORT

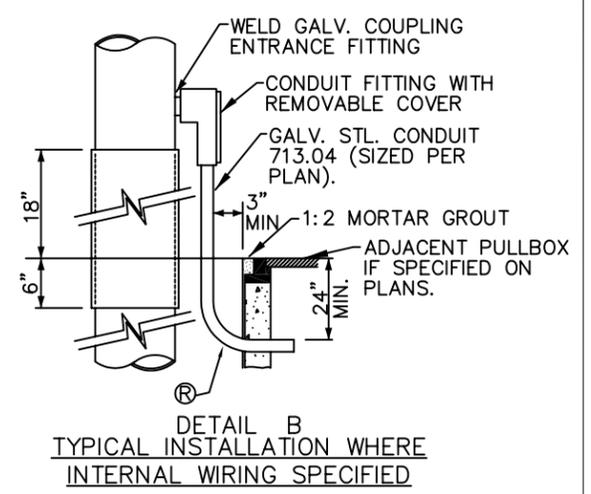


TYPICAL EMBEDDED STEEL POLE INSTALLATION



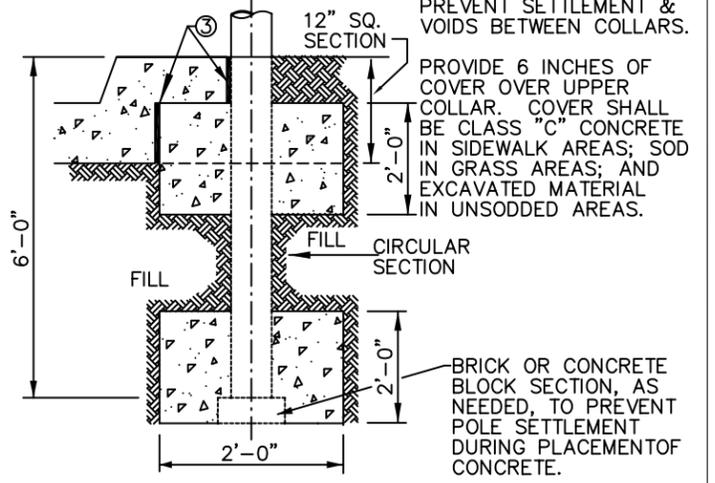
HAND HOLE (MIN.)	4" x 8"
"T" (MIN.)	3/8"
"U" (MIN.)	1 1/2"

TYPICAL CONDUIT WITH 1/16" x 7/8" STAINLESS STEEL BANDING EVERY 3' FOR MORE THAN 10' ABOVE GRADE. EVERY 2 1/2' FOR LESS THAN 10 FT. ABOVE GRADE.



FOUNDATIONS SHALL BE CONSTRUCTED USING COLLARS OF CLASS "C" CONCRETE. COLLARS 2 FT. THICK SHALL BE POURED AT THE BOTTOM OF THE FOUNDATION AND AT 6 INCHES UNDER GRADE. BACKFILL BETWEEN EXCAVATED MATERIAL & IN LAYERS OF 6 INCHES. TAMP TO PREVENT SETTLEMENT & VOIDS BETWEEN COLLARS.

PROVIDE 6 INCHES OF COVER OVER UPPER COLLAR. COVER SHALL BE CLASS "C" CONCRETE IN SIDEWALK AREAS; SOD IN GRASS AREAS; AND EXCAVATED MATERIAL IN UNSODDED AREAS.



FOUNDATIONS FOR EMBEDDED STEEL POLES

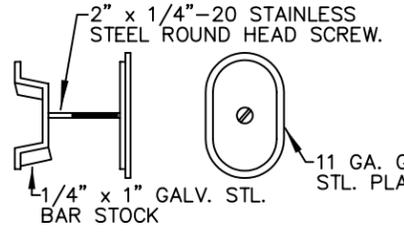
POLES, SUPPORTS, AND FOUNDATIONS (ES - 1)

EMBEDDED BASE SIGNAL STRAIN POLE

CITY OF CINCINNATI
DEPT. OF TRANSPORTATION & ENGINEERING
DIV. OF TRAFFIC ENGR.

APPROVED: <i>Stone Bailey</i>	DATE: 3-4-99		
SCALE	SOURCE	DRAWN	FILE NO.
	REDRAWN FROM ES-4 7/25/72 ES-1-3 5/9/80	CDS ASSOCIATES	ES - 1 - 3

HAND HOLE COVERS



TYPICAL GROUND LUG INSTALLATION AT TOP OF POLE FOR GROUNDING MESS. CA. OR OTHER SPECIFIED GROUNDED CONDUCTORS AND FOR GROUND WIRE CONNECTION FROM POLE TO GROUND ROD.

TYPICAL GROUNDING LUG MADE OF HIGH STRENGTH COPPER OR COPPER ALLOY. SINGLE BARREL 2 HOLE TANG LUG. DRILL & TAP FOR 2 EACH 5/16" BOLTS. BLACKBURN L-125-2, T&B 1300 SERIES OR APPROVE EQUAL.

SHAFT FITTINGS

ALL FITTINGS, BOLTS, NUTS, SCREWS, STRUD, WASHERS, COUPLINGS & OTHER SIMILAR FASTENINGS SHALL BE MADE FROM AN APPROVED CORROSION-RESISTANT MATERIAL SUCH AS STAINLESS STEEL OR GALV. STEEL. IF GALVANIZED FITTINGS ARE USED, THEY SHALL BE GALVANIZED BY THE HOT-DIP PROCESS AFTER FABRICATION, IN ACCORDANCE WITH ASTM A-123 & ASTM A-153.

CASTINGS

ALL CASTINGS SHALL BE CLEAN & SMOOTH, WITH ALL DETAILS WELL-DEFINED & TRUE TO PATTERN. GREY IRON CASTINGS SHALL CONFORM TO ASTM A-126, CLASS A. STEEL CASTINGS SHALL CONFORM TO ASTM A-27-58, GRADE 65-35.

EMBEDDED BASE POLE MECHANICAL DATA										NOTE
STEEL PIPE TYPE	ASTM A-53 GRADE B			ASTM A-53 GRADE B			ASTM A-36			ONE POLE SIZE OF SEVERAL MFG. PIPE MATERIAL
OVERALL LENGTH (FT.)	34			34			34			
ABOVE GROUND LINE (FT.)	28			28			28			
MINIMUM LOAD TO PERMANENT SET (LBS.)	3500			3575			3800			
MAXIMUM DEFLECTION IN 100# OF LOAD (IN.)	0.30			0.234			0.250			
SECTIONS	H1 BUTT	H2 MIDDLE	H3 TOP	H1 BUTT	H2 MIDDLE	H3 TOP	H1 BUTT	H2 MIDDLE	H3 TOP	
SECTION LENGTHS (FT.)	20 1/2	*N.A.	15 1/2	20	10	7	20 1/2	*N.A.	15 1/2	
OUTSIDE DIAMETER OF SECTIONS (IN.)	10 3/4	*N.A.	8 5/8	10 3/4	9 5/8	8 5/8	10 3/4	*N.A.	8 5/8	
WALL THICKNESS OF SECTIONS (IN.)	0.279	*N.A.	0.188	0.365	0.342	0.322	0.483	*N.A.	0.312	

* NOT APPLICABLE

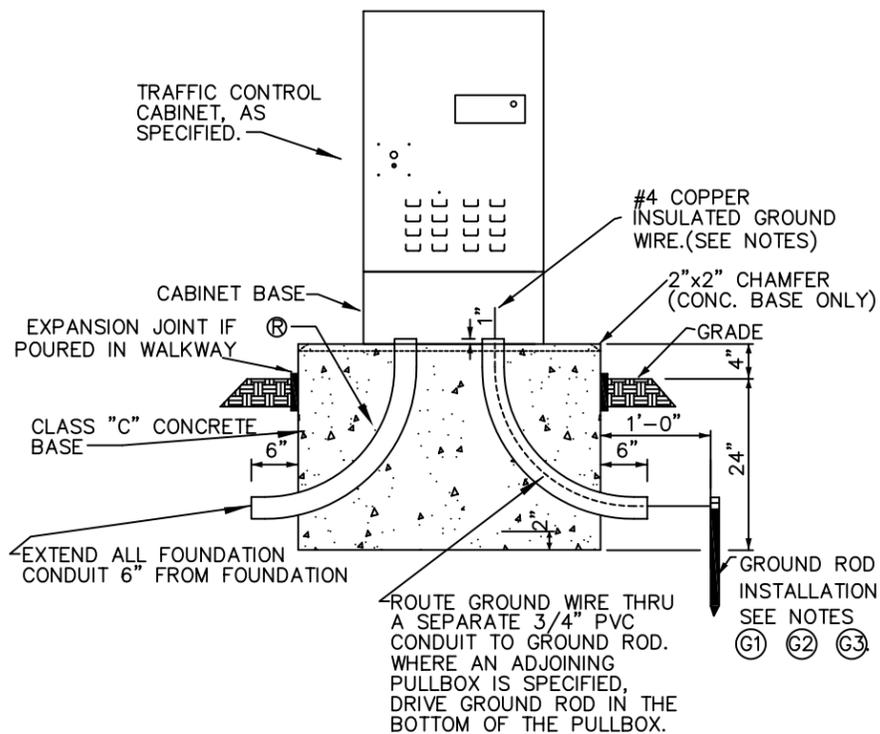
- NOTES FOR EMBEDDED POLES**
- SPLIT BOLT CONNECTOR: DOSSERT, BLACKBURN, McGRAW-EDISON OR APPROVED EQUAL.
 - #6 AWG. BARE COPPER GROUND WIRE. GROUND MESSENGER CABLE TO POLE GROUND WIRE.
 - EXPANSION JOINTS SHALL BE 1/2" PREFORMED ELASTIC JOINT SEALER, 705.1 1. PROVIDE BETWEEN POLE ABUTTING PAVED AREAS.
 - TYPICAL GROUND ROD INSTALLATION ADJACENT TO FOUNDATION.
 - CONDUIT RISER IN FOUNDATION SHALL HAVE 24" RADIUS OF BEND.
- ACCESSORIES**
J-HOOK, HANDHOLE & GROUND NUT SHALL BE PROVIDED UNLESS OTHERWISE SPECIFIED.



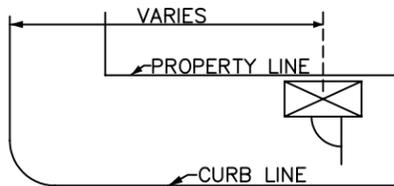
S.C.H.	<i>Stone Bailey</i>	7/19/04	UPDATE
T.E.		3/1/98	
DESIGN	REVISION APPROVED	DATE	WO #
R.R.R.			



TYPICAL GROUND MOUNTED FOUNDATION INSTALLATIONS

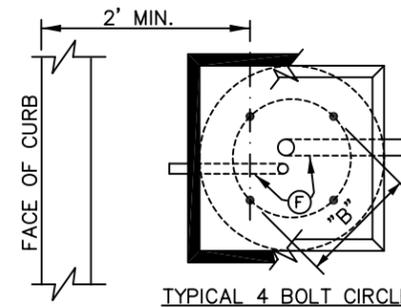


TYPICAL CABINET LOCATION

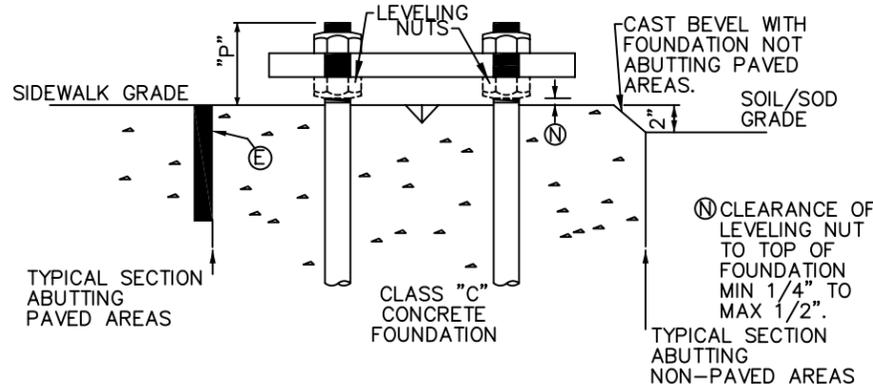
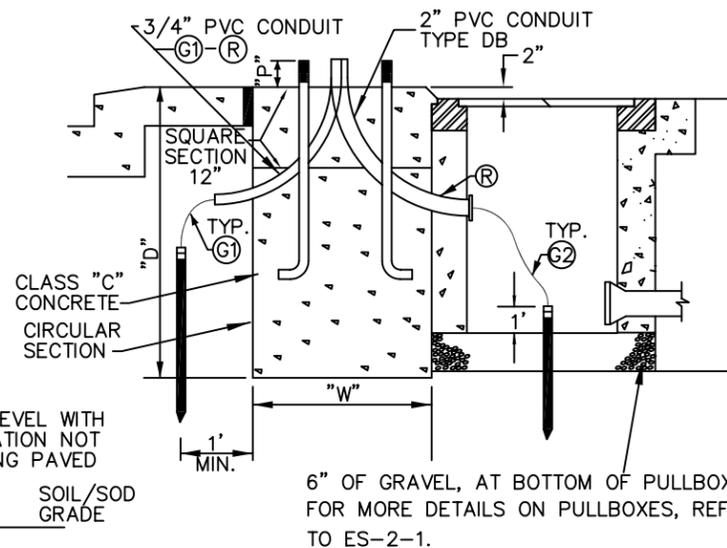
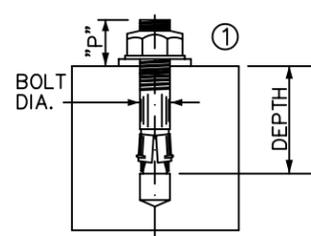


LOCATE AS SHOWN ON PLAN. POSITION CABINET SO THAT DOOR, WHEN OPEN, DOES NOT ENCR OACH ON STREET OR PRIVATE PROPERTY. LONG AXIS OF FOUNDATION SHALL BE PARALLEL TO CURB LINE.

TYPICAL FOUNDATION FOR PEDESTALS AND POSTS



ANCHOR BOLT PROJECTION (P) (CONC. BASE ONLY)



FOUNDATIONS

CONCRETE SHALL BE CLASS C. TOP OF FOUNDATIONS SHALL BE SLOPED TO MEET EXISTING SIDEWALK.

FOUNDATION CONDUIT

(R) MINIMUM RADIUS OF BEND INSTALLED IN FOUNDATION SHALL BE 24 INCHES. CONDUIT SHALL NOT BE PLACED CLOSER THAN 1" TO ANCHOR BOLTS. CONDUIT THAT LEAVES FOUNDATION UNDER PAVEMENT SHALL BE A MINIMUM OF 24" BELOW PAVEMENT.

(F) ALL CONDUIT PLACED IN FOUNDATIONS SHALL BE 2" PVC TYPE DB OTHER THAN THE CONTROLLER FOUNDATION, WHICH IS 4" PVC, UNLESS SPECIFIED OTHERWISE ON THE PLANS. THE CORRECT NUMBER AND SIZE CONDUIT SHALL BE INSTALLED IN THE FOUNDATION FOR PROPER CONNECTION TO EXTERNAL CONDUIT RUNS SPECIFIED ON THE PLANS. INSTALL ADDITIONAL 3/4" PVC SCHEDULE 40 CONDUIT FOR CONNECTING GROUND WIRE FROM POLE TO GROUND ROD.

EXPANSION JOINTS

(E) EXPANSION JOINTS SHALL BE 1/2" PREFORMED JOINT FILLER 705.03 AND SHALL BE PROVIDED BETWEEN FOUNDATIONS AND ABUTTING PAVED AREAS AND PULLBOXES.

GROUND RODS

GROUND RODS SHALL BE COPPER CLAD (BONDED COPPER TO STEEL) HIGH STRENGTH STEEL, 1" INCH DIA. x 10 FEET LONG. GROUND CABLE GROUNDING POLE OR CABINET TO GROUND ROD SHALL BE NO. 4 AWG STRANDED COPPER CABLE WITH RHH/RHW/USE OR TYPE UF, 600 VOLT INSULATION. SHALL BE ATTACHED WITH A 1" GROUND ROD CLAMP OR MAY BE EXOTHERMICALLY WELDED.

TYPICAL GROUND ROD INSTALLATION METHODS

GROUND RODS SHOULD ALWAYS GO IN PULLBOX WHEN PULLBOX IS WITHIN 5' OF POLE.

(G1) ADJACENT TO FOUNDATION

(G2) IN BOTTOM OF PULLBOX

(G3) IN BOTTOM OF FOUNDATION (FOR DETAIL SEE STD. DWG. ES-1-1)

PAYMENT FOR GROUND RODS SHALL BE PER ITEM 625 (ODOT) OR 1320 CITY OF CINCINNATI PER CONTRACT SPECS.

ANCHOR BOLTS

ANCHOR BOLTS ARE FURNISHED WITH POSTS & CABINETS AND PAYMENT WILL BE MADE UNDER THE ITEM FOR POST/CABINET BUT INSTALLED WITH CONSTRUCTION OF THE FOUNDATION, WHERE POST/CABINET INSTALLATION SPECIFIED TO BE MADE BY OTHERS, ANCHOR BOLTS WILL BE FURNISHED BY OTHERS FOR FOUNDATION CONSTRUCTION.

(1) STANDARD KWIK-BOLTS (FOR APPLICATIONS UNDER NOTE 1)

STUD (BOLT MATERIAL) SHALL BE AISI 11L41 FOR BOLT DIAMETERS 1/4" - 1/2" AND AISI 1144 FOR DIAMETERS 5/8" - 1 1/4", MEETING THE CHEMICAL REQUIREMENTS FOR ASTM SPECIFICATION A 108.

TWO INDEPENDENT EXPANSION WEDGES SHALL BE MADE FROM AISI 1050 SPRING STEEL.

NUTS SHALL BE OF COMMERCIAL MANUFACTURE, MEETING ASTM A 307, GRADE A (E.G. AISI SERIES 10XX).

WASHERS SHALL BE FABRICATED FROM SAE STANDARD MATERIAL IN ACCORDANCE WITH ASA STANDARD #B27.2-1965.

KWIK-BOLTS SHALL BE PLATED IN ACCORDANCE WITH THE REQUIREMENTS OF FEDERAL SPECIFICATION QQ-Z-325C, TYPE II, CLASS 3, (CLEAR CHROMATE TREATMENT).

THE KWIK-BOLT SHALL MEET THE DIMENSIONAL REQUIREMENTS OF FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS 1.

FOR GROUND MOUNTED CABINET USE 3/4" DIA. x 8" LONG

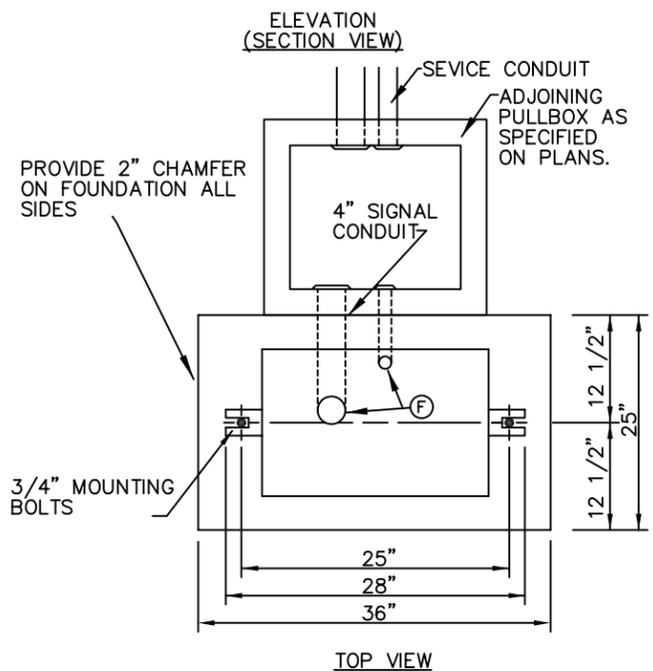
KWIK-BOLT INSTALLATION

1. DRILL HOLE SAME DIAMETER AS BOLT AND DEEPER THAN BOLT DEPTH.
2. DRIVE BOLT USING A SPARE NUT ON EXPOSED END FOR DRIVING SURFACE. OBSERVE BOLT PROJECTION DIMENSION.
3. TIGHTEN NUT TO WHERE RESISTANCE INCREASES AFTER THIRD OR FOURTH TURN.

(2) SECURE CABINET TO CABINET BASE. FURNISH & INSTALL 4 EACH 5/16" x 2" LONG STAINLESS STEEL BOLTS, NUTS & WASHERS.

STAKING

STAKING SHALL BE PROVIDED BY THE CONTRACTOR, OR OTHERS, AS SPECIFIED ON THE PLANS. WHERE NO SURVEY STATION REFERENCE OR DIMENSIONS ARE PROVIDED IN THE PLANS, THE CITY WILL PROVIDE STAKING.



FOUNDATION DATA										
FOUND. DESIGN NUMBER	POLE DATA	ANCHOR BOLT DIMENSIONS			FOUNDATION DIMENSIONS		CONC. FOR FOUND.	SPECIAL NOTES		
		NOS. OF BOLTS	BOLT SIZE	BOLT CIRCLE "B"	BOLT PROJECT. "P"	DEPTH "D"				
TRAFFIC PEDESTALS										
FDN 20	4" DIA.x4 1/2' LONG	4	3/4x12	9	1 1/2	2	2	0.29	CITY DESIGN #445	
FDN 25	4" DIA.x10' LONG	4	3/4x30	9	1 1/2	2	2	0.56	CITY DESIGN #1045 & MOINX	
LIGHTING POSTS										
FDN 30	10' LONG CAST IRON	3-4*	3/4x12	*	*	*	*	0.50	EXISTING OLD BOULEVARD POST	
FDN 31	10' LONG CAST IRON	4	7/8x24	12 1/2	3	4	2	0.50	MADISON STYLE POST	
FDN 34	11' LONG FIBERGLASS	3	5/8x21	16	2	4	2	0.50	BUCKINGHAM SERIES POST	
FDN 36	13'-1" LONG CONCRETE	4	3/4x28	10	1 3/4	4	2	0.50	ROUND SERIES SBR-4	
FDN 37	13' LONG CONCRETE	4	3/4x28	17	1 3/4	4	2	0.50	OCTAGONAL SERIES VBS-4	
FDN 39	12' LONG STEEL	3	3/4x30	8	1 3/4	4	2	0.50	TUBULAR TAPERED	
FDN 40	20' LONG STEEL	3	3/4x30	8	1 3/4	5	2	0.61	STEEL POST	
CABINETS										
GROUND MOUNT CABINET		2	3/4x8	25 C/C	3	2	1.67x2.5	0.31	USE UNLESS OTHERWISE SPECIFIED	



POLES, SUPPORTS, AND FOUNDATIONS (ES - 1)

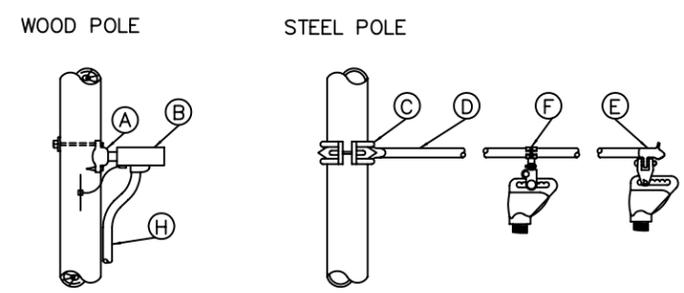
CABINET, PEDESTAL & POLE FOUNDATIONS

CITY OF CINCINNATI
DEPT. OF TRANSPORTATION AND ENGINEERING
DIV. OF TRAFFIC ENGR.

S.C.H.	Steve Bailey	7/16/04	UPDATE
T.E.		3/1/98	
DESIGN	REVISION	DATE	WO #
RF/MLK	APPROVED	12/06/94	

APPROVED *Steve Bailey* DATE 3-4-99

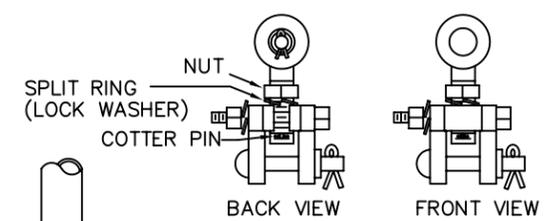
SCALE	SOURCE	DRAWN	FILE NO.
			ES-1-2



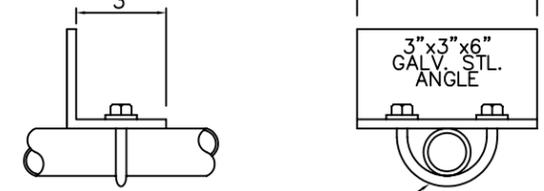
- (A) GALV. STL. WOOD POLE PLATE FOR 2" STD. STL. PIPE FASTEN WITH 1 EA. 5/8" GALV. STL. THROUGH BOLT, NUT AND WASHERS & 1 EA. 3/8"x4" GALV. STL. LAG SCREW.
- (B) GALV. STL. SERVICE TEE, 2"x2"x1" OR 1-1/2" FOR CONDUIT SPEC.
- (C) GALV. OR MALLEABLE IRON POLE CLAMP.
- (D) 2" STD. STEEL PIPE, GALV., SCH. 40 (ASTM-A53)
- (E) MAST ARM END HANGER ASSEMBLY, ICC MODEL TL4117, EAGLE SIGNAL Co. MODEL BK-21, OR APPROVED EQUAL.
- (F) MAST ARM MOUNTING - SWIVEL BALANCE SADDLE CLAMP ICC MODEL 0700453 OR APPROVED EQUAL.

TYPE I

GALV. BALANCE ADJUSTER

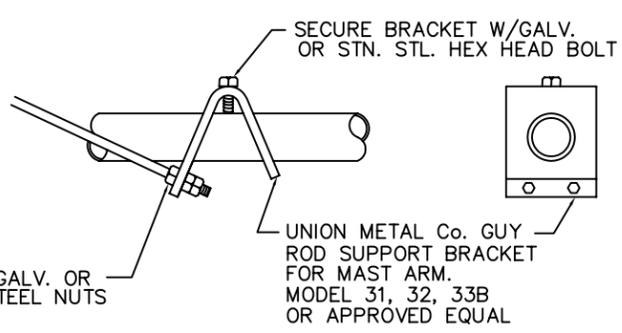


GUY SUPPORTS



3/8" GALV. U BOLT W/GALV. STL. OR STN. STL. NUTS AND WASHERS.

FABRICATED GUY SUPPORT

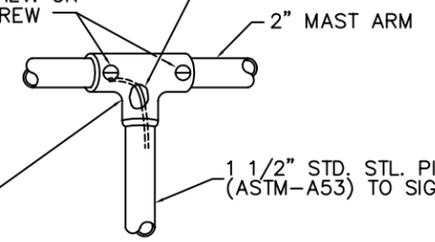


3 EA. 1/2" GALV. OR STAINLESS STEEL NUTS

ADJUSTABLE SIGNAL HANGER TEE

FOR SIGNAL SUSPENSION OTHER THAN END OF ARM, DRILL HOLE IN MAST ARM, REMOVE BURRS, AND PAINT WITH "ZINCIT". FEED SIGNAL CABLE INTERNALLY THROUGH PIPING TO SIGNAL HEAD.

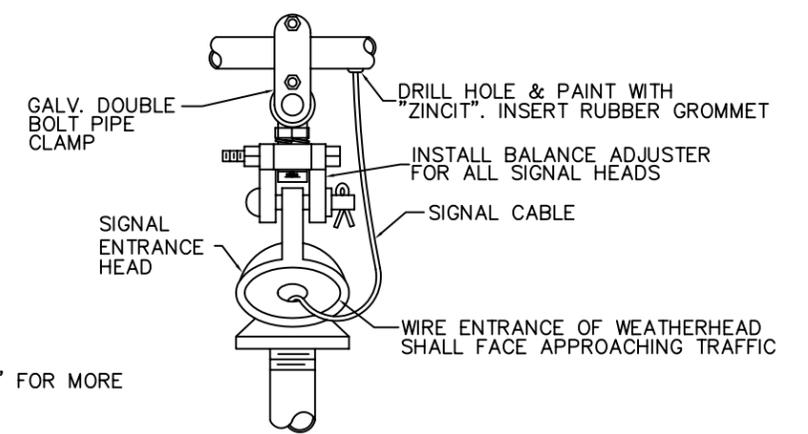
1/4" (MIN) EA. GALV. OR STN. STL. SET SCREW



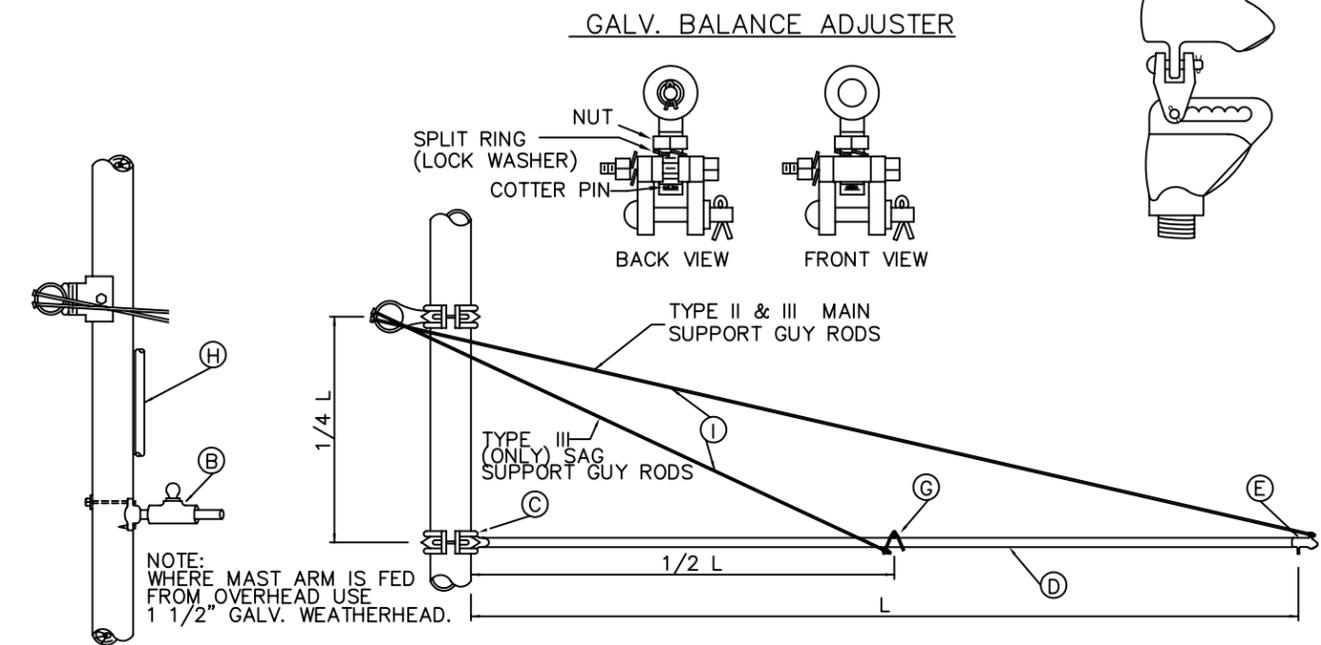
2 1/2"x2 1/2"x 1 1/2" GALV. SLIP FITTING. REMOVE THREADS ON 2 1/2" ENDS FOR SLIP FIT OVER 2" MAST ARM PIPE. REMOVE BURRS & APPLY COAT OF "ZINCIT" TO INTERIOR OF TEE.

HANGER ASSEMBLY

FOR ILLUM. SIGNS & SIGNALS



GALV. DOUBLE BOLT PIPE CLAMPS



TYPE II & III

NOTE: WHERE MAST ARM IS FED FROM OVERHEAD USE 1 1/2" GALV. WEATHERHEAD.

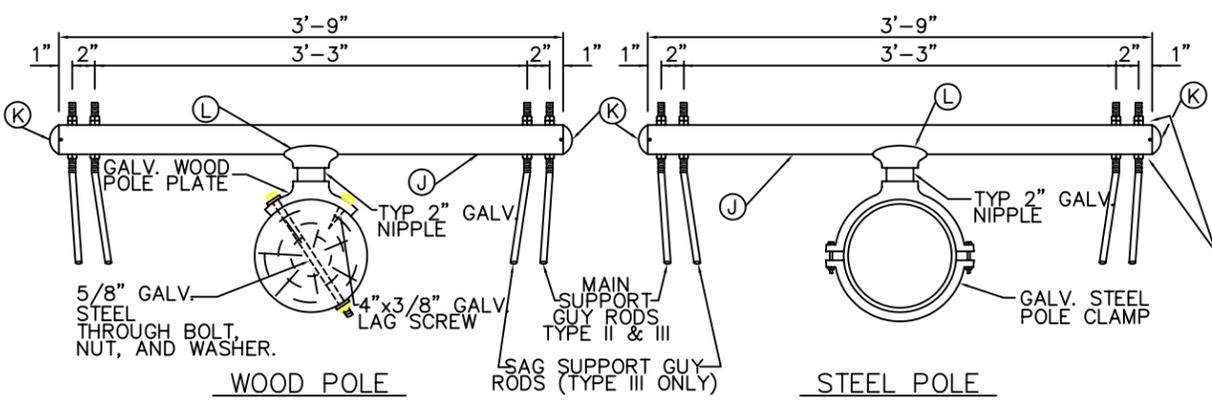
(H) 1" OR 1 1/2" PVC CONDUIT, SCHEDULE 40 1" FOR ONE SIGNAL CABLE, 1 1/2" FOR MORE THAN ONE SIGNAL CABLE.

(I) 1/2" GALV. STL. GUY ROD. THREAD AND PAINT ENDS WITH "ZINCIT". FASTEN AS SHOWN IN DETAILS.

(J) 2" STD. STL. PIPE, GALV., SCH 40 (ASTM -A53)

(K) HOT DIPPED GALV. STN. OR C.I. PIPE CAP. FASTENED WITH 2 STN. STL. SCREWS.

(L) WELD 2" GALV. HALF COUPLING TO 2" STL. PIPE. SECURE STL. POLE CLAMP/WOOD POLE PLATE WITH 2" GALV. STL. NIPPLE.



WOOD POLE

STEEL POLE

GENERAL NOTES

GROUND ALL MAST ARMS ON WOOD POLES WITH #6 AWG BARE COPPER WIRE, SPLIT BOLT CONNECTOR & APPROVED GROUNDING LUG.
 ON STEEL POLES, DRILL, REMOVE BURRS, & PAINT WITH "ZINCIT". 1 1/2" HOLE UNDER COLLAR OF POLE CLAMP. FEED SIGNAL CABLE INTERNALLY WITHIN POLE & MAST ARM.
 ALL SIGNS, SIGNALS, & DETECTORS SHALL BE SUSPENDED FROM MAST ARMS WITH 17.0 FT. VERTICAL CLEARANCE ABOVE ROADWAY.

MAST ARM CONFIGURATION	MAX. MAST ARM LENGTH/LOAD		
	1 UNIT	2 UNIT	1 LRG. UNIT
TYPE I	4'	-	-
TYPE II	12'	10'	8'
TYPE III	20'	20'	15'



POLES, SUPPORTS, AND FOUNDATIONS (ES - 1)

GUY WIRE SUPPORTED MAST ARMS

CITY OF CINCINNATI
 DEPT. OF TRANSPORTATION AND ENGINEERING
 DIV. OF TRAFFIC ENGR.

S.C.H.	Steve Bailey	7/20/04	UPDATE	APPROVED: <i>Steve Bailey</i> DATE: 3-4-99			
T.E.		3/1/98		SCALE	SOURCE	DRAWN	FILE NO.
DESIGN	REVISION	DATE	WO #		ES - 16	CDS ASSOCIATES	ES-1-5
R.R.R.	APPROVED	11\1\91			7/7/72		