PURPOSE AND SCOPE:

THIS DOCUMENT CONTAINS INFORMATION RELATING TO THE PLACEMENT OF PAD MOUNTED ELECTRICAL EQUIPMENT. THIS IS A GUIDE FOR DETERMINING THE MINIMUM REQUIREMENTS FOR EACH SPECIFIC INSTALLATION.

CLEARANCES:

1. CLEARANCES FROM BUILDING WALLS (SEE SHT. 6) - OIL FILLED PAD MOUNTED EQUIPMENT SHALL HAVE THE FOLLOWING CLEARANCES:

   A. 3 FEET MINIMUM FROM ANY BUILDING WALL TO THE EDGE OF THE PAD. THIS CLEARANCE MAY BE REDUCED TO 2 FEET IF THE BUILDING SURFACE IS NONCOMBUSTIBLE, WITH APPROVAL OF ELECTRIC UTILITY ENGINEERING.

2. DOORWAY AND WINDOW CLEARANCE (SEE SHT. 6) - PAD MOUNTED EQUIPMENT SHALL NOT BE PLACED WHERE IT IMPEDES THE FLOW OF AIR OR TRAFFIC THROUGH A DOORWAY OR WINDOW. CLEARANCE SHALL BE 10 FEET RADIALLY FROM THE DOORWAY OR WINDOW TO THE CLOSEST EDGE OF THE PAD.

3. VERTICAL CLEARANCE FROM OVERHANGS (SEE SHT. 7) - TO PROVIDE SPACE FOR HOISTING EQUIPMENT SO THAT IT CAN BE REPLACED, THE FOLLOWING VERTICAL CLEARANCES FROM THE TOP OF THE PAD ARE REQUIRED:

   A. 20 FEET MINIMUM FOR 1Ø PAD MOUNTED EQUIPMENT.

   B. 30 FEET MINIMUM FOR 3Ø PAD MOUNT EQUIPMENT.

   C. WHEN REQUIRED FOR INSTALLATIONS SUCH AS IN DRY VAULTS, THE CLEARANCES FOR PAD MOUNT EQUIPMENT MAY BE REDUCED TO 10 FEET FROM THE TOP OF THE PAD. THIS REDUCED CLEARANCE WILL GREATLY INCREASE THE REPLACEMENT TIME, SINCE THE EQUIPMENT MUST BE JACKED AND ROLLED OUT TO A POSITION WHERE THE CLEARANCE IS ADEQUATE TO HOIST IT.

APPROVED 2008		ENGINEERING STANDARD				
Original Signed and Approved by Engineering Manager		*PAD MOUNT CLEARANCE REQUIREMENTS*				
ENGR MANAGER						
			1. REV	09/08 DATE	REVISED NOTES 1 AND 2 DESCRIPTION	TT APPR
VICE TT						
DRAWN MD		CITY OF PALO ALTO	NTS		*DT-CL-U-1031*	*1* OF *9*
CHECKED PV		CALIFORNIA	SCALE		STANDARD DWG. NO.	SHEET NO.

HORIZONTAL WORK SPACE REQUIREMENTS:

4. CLEAR AND LEVEL WORK AREAS ARE REQUIRED AROUND PAD MOUNTED EQUIPMENT TO PROVIDE A SAFE WORKING SPACE TO OPERATE AND MAINTAIN THE EQUIPMENT.

5. PAD MOUNTED EQUIPMENT (SEE SHT. 9):

   A. 8 FEET MINIMUM IN FRONT OF ALL EQUIPMENT DOORS TO PROVIDE ROOM TO OPERATE WITH HOT STICKS.

   B. 3 FEET MINIMUM FROM NON-OPERABLE SIDES. THIS CLEARANCE MAY BE REDUCED WITH APPROVAL BY THE ELECTRICAL ENGINEERING DEPARTMENT FOR LANDSCAPING OBSTRUCTIONS (DECORATIVE WALLS, PLANTERS, ROCKS, ETC.) THAT MAY BE PLACED NEXT TO THE PAD ON NON OPERABLE SIDES.

PROTECTION FROM VEHICULAR TRAFFIC:

6. PHYSICAL PROTECTION FROM VEHICULAR TRAFFIC SHALL BE PROVIDED IN ACCORDANCE WITH THE LEVEL OF EXPOSURE. BARRIER POSTS, ETC., ARE INTENDED TO PROVIDE REASONABLE WARNING FROM ACCIDENTAL VEHICULAR CONTACT, RATHER THAN PREVENTING ALL POSSIBLE CONTACT. WHEN THE ELECTRIC ENGINEERING, OR OPERATIONS, DEPARTMENT DETERMINES IT NECESSARY, THE APPLICANT WILL PROVIDE PHYSICAL PROTECTION AS SPECIFIED BY THE CITY. (SEE DT-SS-C-1005)

7. PAD MOUNTED EQUIPMENT HAVING THE FOLLOWING SET BACKS MAY NOT REQUIRE THE CUSTOMER TO PROVIDE ADDITIONAL PHYSICAL PROTECTION:

   A. SINGLE-FAMILY, DUPLEX AND OTHER LOW DENSITY RESIDENTIAL AREAS: 3 FEET MINIMUM FROM THE EDGE OF THE CURB.

   B. COMMERCIAL, APARTMENT, CONDOMINIUM AND OTHER HIGH DENSITY AREAS: 9 FEET FROM THE EDGE OF THE ROAD OR CURB DUE TO HIGH VEHICULAR TRAFFIC AND FREQUENT TRUCK BACKING. THE DESIGN OF THE PARTICULAR LAYOUT MAY, OF COURSE, CALL FOR AN INCREASE OR DECREASE IN THESE DIMENSIONS. FOR EXAMPLE, A 3 FOOT SET BACK IS OFTEN ADEQUATE FOR PARTS OF THE COMMERCIAL PARKING LOTS WHERE TRAFFIC FLOW IS CONSTRAINED AND BACKING PERPENDICULAR TO CURB IS UNLIKELY.

APPROVED 2008 (Original Signed and Approved by Engineering Manager)	ENGINEERING STANDARD *PAD MOUNT CLEARANCE REQUIREMENTS*				
ENGR. MANAGER		1. REV	09/08 DATE	REVISED NOTES DESCRIPTION	TTC APPR
ENGR.		CITY OF PALO ALTO CALIFORNIA	NTS SCALE	DT-CL-U-1031 STANDARD DWG. NO.	2 OF 9 SHEET NO.
DRAWN					
CHECKED PV					

8. STEEL POSTS ARE THE STANDARD MEANS FOR PROVIDING SUCH PHYSICAL PROTECTION. SUITABLE ALTERNATIVES TO THESE PROTECTIVE POSTS MAY BE PROPOSED BY THE APPLICANT FOR CITY APPROVAL.

9. ALL BARRIER POSTS AT THE SAME INSTALLATION SITE WILL BE THE SAME HEIGHT AND SHALL BE PAINTED PADMOUNT GREEN.

10. A BUILDING CAN BE CONSIDERED AS PHYSICAL PROTECTION PROVIDED IT IS LOCATED AT A POINT WHERE A POST WOULD BE NORMALLY REQUIRED.

11. LOCATE BARRIER POSTS SO THAT THEY DO NOT INTERFERE WITH OPENING OF THE EQUIPMENT'S DOORS. CERTAIN TYPES OF PAD MOUNTED EQUIPMENT HAVE DOORS IN BOTH FRONT AND BACK AND REQUIRE 8'-0" MINIMUM CLEARANCE AND CAREFUL BARRIER POST PLACEMENT TO ALLOW THE DOORS TO BE OPENED.

12. USE REMOVABLE POSTS WHEN:

    A. POSTS ARE INSTALLED LESS THAN 8 FEET IN FRONT OF THE EQUIPMENT'S DOORS.

    B. WHERE FIXED POSTS WOULD OBSTRUCT ACCESS FOR INSTALLATION OR REPLACEMENT OF THE EQUIPMENT.

HAZARDOUS LOCATIONS:

13. THE FOLLOWING GUIDE IS TO BE USED WHEN INSTALLING PAD MOUNTED EQUIPMENT IN AREAS WHERE HAZARDOUS LIQUIDS AND GASES ARE DISPENSED OR STORED IN SEALED CONTAINERS:

    A. LIQUIFIED FLAMMABLE GASES: DO NOT INSTALL PAD MOUNTED EQUIPMENT WITHIN 20 FEET OF A GAS DISPENSER WITHOUT CONFORMING TO THE REGULATIONS CONCERNING INSTALLATION OF ELECTRICAL EQUIPMENT IN HAZARDOUS AREAS (REFER TO ARTICLES E500-1, E500-2, E514-1 AND E514-2 OF TITLE 24, PART 3, STATE BUILDING STANDARDS).

    B. ANY CONTAINER WHICH STORES FLAMMABLE LIQUID OR GAS WILL BE CONSIDERED EQUIVALENT TO A "COMBUSTIBLE WALL". THE MINIMUM REQUIRED CLEARANCE IS 3 FEET.

APPROVED 12/2008	ENGINEERING STANDARD				
ENGR. MANAGER (Original Signed and Approved by Engineering Manager)	*PAD MOUNT CLEARANCE REQUIREMENTS*	1. REV	09/08 DATE	REVISED NOTES 8 AND 11 DESCRIPTION	TC APPR
DSGN TT	CITY OF PALO ALTO	NTS		*DT-CL-U-1031*	3 OF 9
DRAWN MD	CALIFORNIA	SCALE		STANDARD DWG. NO.	SHEET NO.
CHECKED PV					

OIL CONTAINMENT:

14. OIL ENCLOSURES ARE REQUIRED BY THE STATE OF CALIFORNIA IF PAD MOUNTED TRANSFORMERS ARE LOCATED IN AREAS WHERE OIL FROM A RUPTURED TANK COULD FLOW TOWARDS A COMBUSTIBLE SURFACE. OIL ENCLOSURES MAY CONSIST OF FIRE RESISTANT DIKES, CURBED AREAS OR BASINS, OR TRENCHES FILLED WITH COARSE CRUSHED STONE. THEY MUST BE CAPABLE OF HOLDING THE TOTAL VOLUME OF OIL CONTAINED IN THE EQUIPMENT TANK. THE CONSTRUCTION OF REQUIRED OIL CONTAINMENT FACILITIES MAY IN NO WAY IMPEDE THE REQUIRED WORK SPACE AREA. THE CUSTOMER WILL BE RESPONSIBLE FOR PROVIDING ADEQUATE OIL CONTAINMENT ENCLOSURES TO SATISFY THE REQUIREMENTS OF THE STATE OF CALIFORNIA AND ENVIRONMENTAL PROTECTION REGULATIONS.

RETAINING WALLS:

15. RETAINING WALLS SHALL BE PROVIDED WHEN THE CITY DETERMINES IT NECESARY TO PROTECT EQUIPMENT AGAINST LANDSLIDES, DRAINAGE WASH, DRIFTING SANDS, ETC. THE APPLICANT IS RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF THE RETAINING WALL. THE RETAINING WALL SHALL BE DESIGNED TO PROVIDE A BARRIER OF SUFFICIENT STRENGHTH AND SUITABLE CONSTRUCTION TO PROVIDE ADEQUATE PROTECTION AND WORKING SPACE AROUND THE EQUIPMENT. TYPICAL EXAMPLE OF RETAINING WALL PLACEMENT ARE SHOWN IN SHT. 8 OF THIS DOCUMENT.

16. RETAINING WALLS GREATER THAN 2 FEET IN HEIGHT WILL REQUIRE A DRAIN PIPE AS SHOWN IN SHT. 8 OF THIS DOCUMENT. DRAIN PIPE SHALL BE A 3" PERFORATED PLASTIC PIPE, COVERED FIRST BY MARAFI DRAIN CLOTH, THEN BY DRAIN ROCK AND FINALLY BACKFILLED.

17. TREATED REDWOOD OR PRESSURE-TREATED DOUGLAS FIR POSTS (NOMINAL 4"x4" MINIMUM) AND PLANKS (NOMINAL 2" OR THICKER) MAY BE USED FOR RETAINING WALLS. POSTS SHOULD BE 24" OR LESS IN LENGTH AND EXTENDED AT LEAST 12" BELOW GROUND AND NOT MORE THAN 12" ABOVE GROUND.

18. THE WORKING AREA WITHIN THE RETAINING WALL WILL BE AT THE SAME LEVEL OR BELOW THE PAD BEING PROTECTED. THE AREA WILL BE KEPT WEED FREE AND COVERED WITH A DECORATIVE COVERING.

APPROVED 2008	ENGINEERING STANDARD				
ENGR. MANAGER	*PAD MOUNT CLEARANCE REQUIREMENTS*				
		1. REV	09/08 DATE	REVISED NOTE 14, ADDED NOTE 16 DESCRIPTION	TT APPR
ENGR. TT	CITY OF PALO ALTO CALIFORNIA	NTS SCALE	*DT-CL-U-1031* STANDARD DWG. NO.	*4* OF *9* SHEET NO.	
DRAWN MD					
CHECKED PV					

Original Signed and Approved by Engineering Manager

TRUCK ACCESSIBILITY:

19. PAD MOUNTED EQUIPMENT MUST BE ACCESSIBLE TO CITY TRUCKS. TRUCKS MUST BE ABLE TO BE BACKED UP TO WITHIN 5 FEET OF THE PAD ON:

    A. A SURFACE CAPABLE OF WITHSTANDING TRUCK WEIGHT OF 24 TONS AND

    B. A PATH THAT IS A MINIMUM OF 12 FEET WIDE AND

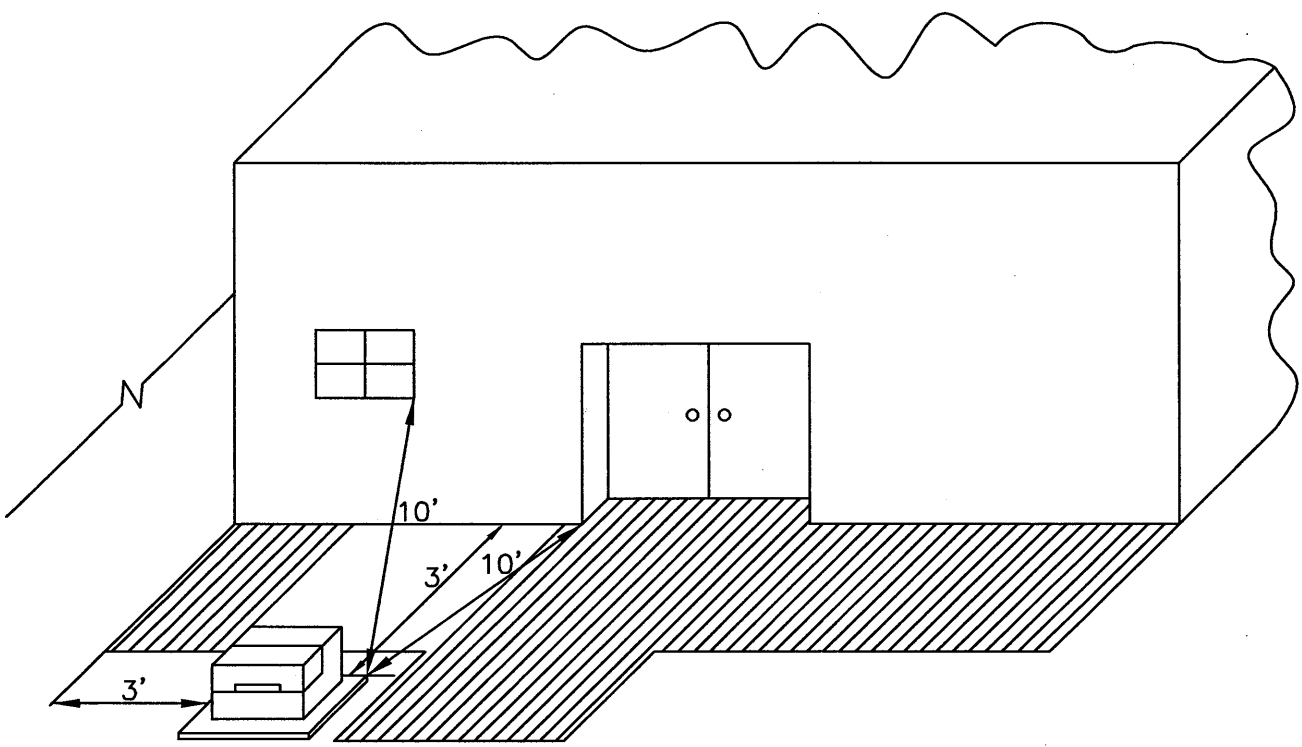
    C. A MINIMUM VERTICAL CLEARANCE OF 14 FEET SHALL BE MAINTAINED FROM THE STREET TO THE EQUIPMENT PAD.

    IF THE PATH TO THE EQUIPMENT PAD REQUIRES ANY TURNS BY CITY TRUCKS, THE MINIMUM REQUIREMENTS OF 12'x14' PREVIOUSLY DESCRIBED MAY NEED TO BE INCREASED. CONSULT CITY ENGINEER WHEN SUCH SITATIONS OCCUR. FOR LOCATIONS WHERE THE STANDARD ACCESSIBILITY REQUIREMENT ARE NOT MET, CONSULT WITH THE CITY FOR OTHER OPTIONS.

FUTURE CONSTRUCTION:

20. CONSIDERATION SHOULD BE GIVEN NOT ONLY TO CONDITIONS EXISTING AT THE TIME OF INSTALLATION BUT ALSO TO POSSIBLE FUTURE STRUCTURES AND EQUIPMENT WHICH COULD INTERFERE WITH REQUIRED CLEARANCES OR ACCESSIBILITY. ON THOSE INSTALLATIONS WHERE THERE IS A HIGH PROBABILITY OF A FUTURE OBSTRUCTION, INSTALL A CLEARANCE REQUIREMENT SIGN ON THE EQUIPMENT.

APPROVED 12/2008	ENGINEERING STANDARD					
ENGR. MANAGER	*PAD MOUNT CLEARANCE REQUIREMENTS*	1.	09/08	REVISED NOTES		TT
Original Signed and Approved by Engineering Manager		REV	DATE	DESCRIPTION		APPR
DSGN TT	CITY OF PALO ALTO	NTS		*DT-CL-U-1031*	*5* OF *9*	
DRAWN MD	CALIFORNIA	SCALE		STANDARD DWG. NO.	SHEET NO.	
CHECKED PV						

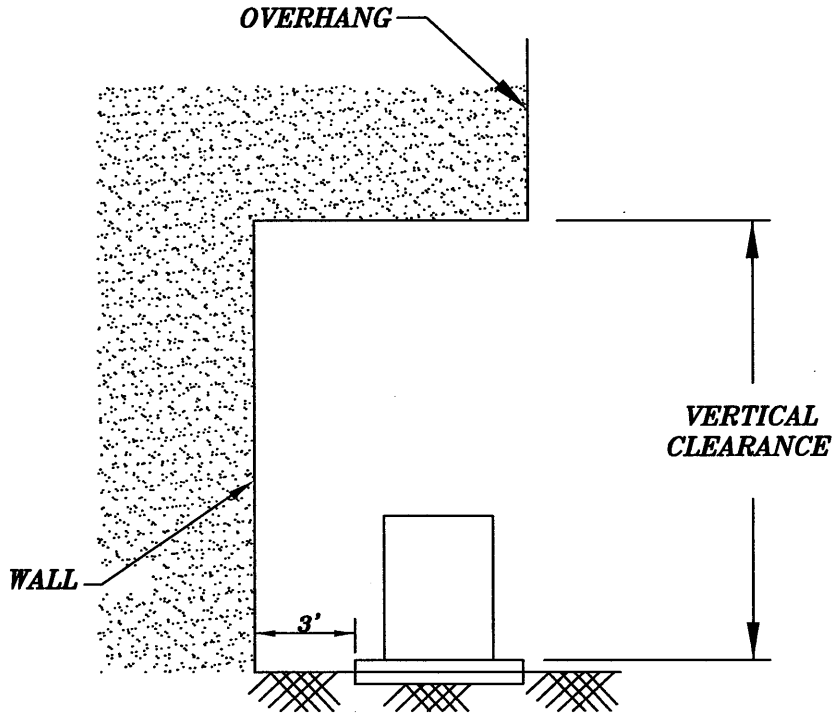


BUILDING, DOORWAY & WINDOW MINIMUM CLEARANCES

NOT TO SCALE

APPROVED _____ 2008	ENGINEERING STANDARD				
ENGR MANAGER	*PAD MOUNT CLEARANCE REQUIREMENTS*	1. REV	09/08 DATE	REVISED DRAWING DESCRIPTION	TT APPR
ENGR TT	CITY OF PALO ALTO	NTS	*DT-CL-U-1031*	*6* OF *9*	
DRAWN MD	CALIFORNIA	SCALE	STANDARD DWG. NO.	SHEET NO.	
CHECKED PV					

Original Signed and Approved by Engineering Manager

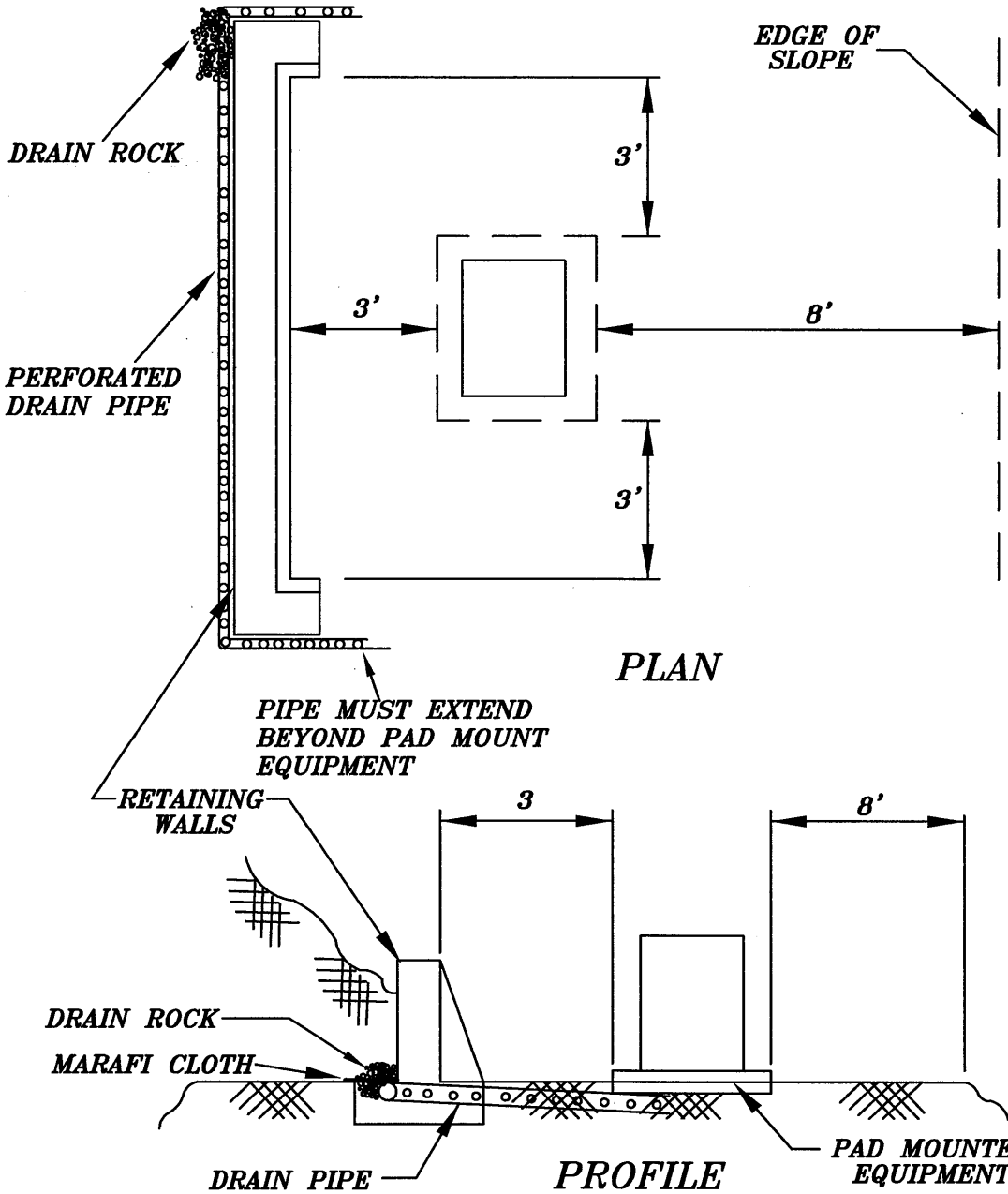


VERTICAL CLEARANCE REQUIREMENTS

VERTICAL CLEARANCE	EQUIPMENT
20'	1ø PAD MOUNTED
30'	3ø PAD MOUNTED

MINIMUM CLEARANCES FOR PAD MOUNTED EQUIPMENT

APPROVED 2008	ENGINEERING STANDARD		
ENGR. MANAGER	*PAD MOUNT CLEARANCE REQUIREMENTS*	1. 09/08	REVISED DRAWING TT
Original Signed and Approved by Engineering Manager		REV DATE	DESCRIPTION APPR
ENGR TT	CITY OF PALO ALTO	NTS	DT-CL-U-1031 7 OF 9
DRAWN MD	CALIFORNIA		
CHECKED PV		SCALE	STANDARD DWG. NO. SHEET NO.

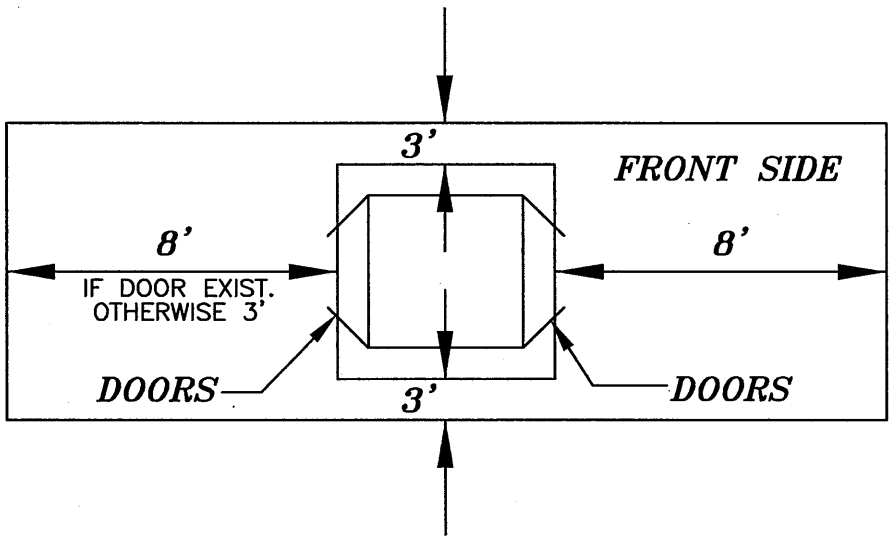


EXAMPLE OF PAD MOUNTED EQUIPMENT INSTALLATION ON SLOPED TERRAIN

APPROVED 2008	ENGINEERING STANDARD				
ENGR. MANAGER	PAD MOUNT CLEARANCE REQUIREMENTS				
ENGR TT		1.	09/08	REVISED DRAWING	TT
DRAWN MD		REV	DATE	DESCRIPTION	APPR
CHECKED PV	CITY OF PALO ALTO CALIFORNIA	NTS		DT-CL-U-1031	8 OF 9
		SCALE		STANDARD DWG. NO.	SHEET NO.

Original Signed and Approved by Engineering Manager

PAD MOUNTED SWITCH OR CAPACITOR



WORK SPACE FOR PAD MOUNTED SWITCHES AND CAPACITORS

APPROVED 2008	ENGINEERING STANDARD				
ENGR MANAGER	*PAD MOUNT CLEARANCE REQUIREMENTS*	1. REV	09/08 DATE	REVISED DRAWING DESCRIPTION	TT APPR
ENGR TT	CITY OF PALO ALTO	NTS	*DT-CL-U-1031*		*9* OF *9*
DRAWN MD	CALIFORNIA	SCALE	STANDARD DWG. NO.		SHEET NO.
CHECKED PV					

Original Signed and Approved by Engineering Manager

THIS DRAWING OUTLINES THE MINIMUM REQUIREMENTS FOR CONDUIT AND CABLE INSTALLED BY CUSTOMERS, CONTRACTORS, OR DEVELOPERS FOR THE SERVICE LATERAL TO ANY NEW OR UPGRADED ELECTRIC SERVICE PANEL. LARGER THAN SPECIFIED CABLE AND CONDUIT MAY BE REQUIRED FOR A GIVEN PANEL SIZE TO MEET ALLOWABLE VOLTAGE DROP AND FLICKER LEVELS.

CONDUITS AND CABLE REQUIREMENTS FOR RESIDENTIAL SERVICE

Maximum Service Equipment "Panel" Rating (Amps) (80% Rated Services)	Conduit Size and Quantity	Aluminum Cables Required (per phase) – Full Size Neutral Required (AWG or kcmil)	Copper Cables Required (per phase) – Full Size Neutral Required (AWG or kcmil)
125	1 – 2"	1 – 1/0	1 – # 2
200	1 – 2"	1 – 4/0	1 – 2/0
400	1 – 4"	1 – 350	1 – 4/0

CONDUIT AND CABLE REQUIREMENTS FOR COMMERCIAL/INDUSTRIAL SERVICES – SINGLE PHASE

Maximum Service Equipment "Panel" Rating (Amps) (100% Rated Services)	Conduit Size and Quantity	Aluminum Cables Required (per phase) – Full Size Neutral Required (AWG or kcmil)	Copper Cables Required (per phase) – Full Size Neutral Required (AWG or kcmil)
125	1 – 2"	1 – 4/0	1 – 1/0
200	1 – 4"	1 – 350	1 – 4/0
400	1 – 4"	1 – 500	1 – 350

CONDUIT AND CABLE REQUIREMENTS FOR COMMERCIAL/INDUSTRIAL SERVICES – THREE PHASE

Maximum Service Equipment "Panel" Rating (Amps) (100% Rated Services)	Conduit Size and Quantity	Aluminum Cables Required (per phase) – Full Size Neutral Required (AWG or kcmil)	Copper Cables Required (per phase) – Full Size Neutral Required (AWG or kcmil)
400	1 – 4"	1 – 750	1-500
600	2 – 4"	2 – 500	2 – 350
800	2 – 4"	2 – 750	2 – 500
1000	3 – 4"	3 – 750	3 – 500
1200	4 – 4"	4 – 750	3 – 750 or 4 – 500
1600	4 – 4"	4 – 750	4 – 500
1800 *	4 – 4"	None Approved	4 – 500 X-Flex
2000 *	6 – 4"	None Approved	6 – 500 X-Flex
2500 *	6 – 4"	None Approved	6 – 500 X-Flex
3000 *	7 – 4"	None Approved	7 – 500 X-Flex
4000 * (Max Demand 2500 kVA)	7 – 4"	None Approved	7 – 500 X-Flex

*Bus Way/Transition Cabinet – See CPAU drawing SR–XF–E–1020 for details – may be used in place of conduit and X–Flex cables.

APPROVED ____ 200	ENGINEERING STANDARD		
Original Signed and Approved by Engineering Manager	UNDERGROUND SERVICE CONDUIT AND CABLE REQUIREMENTS	1 / 9/09 / Revised 400A, 1ph Svc Cable / TT	
ENGR. MANAGER		REV / DATE / DESCRIPTION	APPR
ENGR. TT	CITY OF PALO ALTO CALIFORNIA	NTS / DT-SE-U-1032	1 OF 2
DRAWN MD		SCALE / STANDARD NO.	SHEET NO.
CHECKED PV			

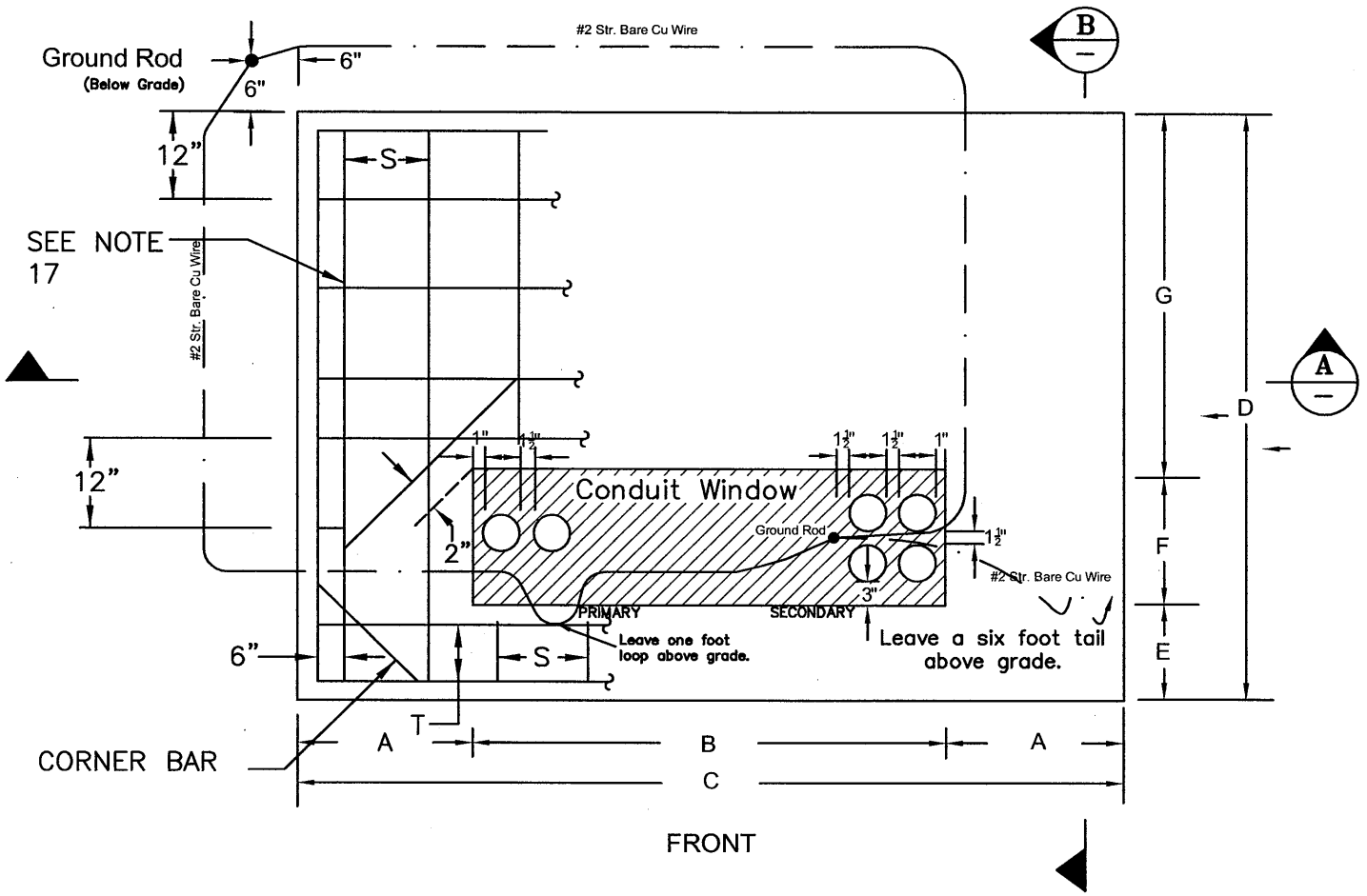
NOTES:

- THE INSTALLATION OF A 4000 A PANEL MUST BE APPROVED BY CITY OF PALO ALTO UTILITIES (CPAU) ELECTRIC ENGINEERING DEPARTMENT. IT IS LIMITED TO A MAXIMUM PEAK DEMAND OF 2500 KVA.
- STANDARD ALLOWABLE SERVICE CABLE SIZES – #2, 1/0, 2/0, 4/0, 350, 500, AND 750 (AWG OR KCMIL) ALUMINUM OR COPPER PER THE TABLES.
- "X–FLEX" IS COBRA WIRE & CABLE, INC., EXTRA FLEXIBLE CABLE, 600V, 105 °C, X–FLEX (PART # A1530MB–DBS OR A1750MB–DBS) OR CPAU APPROVED EQUIVALENT, PER CPAU DRAWING SR–XF–E–1020.
- "X–FLEX" CABLES ARE A CITY OF PALO ALTO UTILITIES NON–STANDARD CABLE . WHEN USED, THE DESIGNATED SERVICE POINT SHALL BE THE SECONDARY TERMINALS OF THE TRANSFORMER. THE CUSTOMER IS RESPONSIBLE FOR MAINTENANCE, OR REPLACEMENT IF NECESSARY, OF THESE CABLES.
- ALLOWABLE CONDUIT SIZES – 2 and 4 INCH. ½ INCH SIZES ARE NOT PERMITTED.
- CONDUIT AND CABLE SIZES INDICATED ARE THE MINIMUM ALLOWABLE SIZES PER PANEL RATING.
- THE FOLLOWING CABLE INSULATION TYPES ARE ALLOWED: XLP, THWN–2, USE–2, OR OTHERWISE RATED FOR UNDERGROUND SERVICE ENTRANCE USE AND APPROVED BY CPAU ELECTRIC ENGINEERING DEPARTMENT.
- CONDUIT SHALL BE SCHEDULE 40, PER UL STD 651 & NEMA TC 2, OR DB–120 PVC CONDUIT, PER NEMA TC 6 & TC 8 AND ASTM F–512, FOR BELOW GROUND INSTALLATIONS; GALVINIZED STEEL CONDUIT FOR ABOVE GROUND INSTALLATIONS.
- NO MORE THAN FOUR SERVICE CONDUITS WILL BE INSTALLED TO ANY ONE TRANSFORMER, UNLESS APPROVED BY ELECTRIC ENGINEERING FOR USE WITH "X–FLEX" CABLES AND TRANSFORMERS WITH SECONDARY BUSHING SUPPORTS.
- CONDUIT BENDS MUST NOT EXCEED 90° WITH NO MORE THAN 3 – 90° BENDS (270° TOTAL) BETWEEN PULL BOXES.
- ALLOWABLE BEND RADIUS:

Conduit Size	Minimum Bend Radius
2 inch	24 inches
4 inch	36 inches
5 inch	60 inches
All risers	36 inches

APPROVED 200	ENGINEERING STANDARD				
Original Signed and Approved by Engineering Manager 07	UNDERGROUND SERVICE CONDUIT AND CABLE REQUIREMENTS				
ENGR. MANAGER		REV	DATE	DESCRIPTION	APPR
ENGR. TT	CITY OF PALO ALTO CALIFORNIA	NTS	DT–SE–U–1032		2 OF 2
DRAWN MD		SCALE	STANDARD NO.		SHEET NO.
CHECKED PV					

PAD & REINFORCING BAR DIMENSIONS



TRANSFORMER		*PAD DIMENSIONS, INCHES*										
KVA	LBS(APROX)	A	B	C	D	E	F	G	H**	J**	S**	T**
* 25–75 1Ø	2500	9	30	48	48	10	15	23	12	6	12	6
75–112.5	3000–4500	20	40	80	74	15	20	39	12	6	12	10
150–500	4000–6500	20	48	88	74	15	20	39	12	6	12	10
750–1000	9000–11000	26	48	100	100	15	24	61	15	9	6	10
1500	13000	26	56	108	114	15	24	75	15	9	4	10
2000–2500	20000	29	56	114	120	15	24	81	15	9	4	10

* THIS PAD SHOULD BE USED FOR SINGLE PHASE 75 KVA TRANSFORMERS, NOT THREE PHASE 75 KVA TRANSFORMERS.

** REQUIREMENT FOR PADS POURED IN PLACE

REV	DATE	DESCRIPTION	APPR
10	2–09	GENERAL REVISION	TT
9	7–97	REVISED NOTES	MJ/TF
8	1–97	REVISED PAD DIMENSIONS	PV/TL
7	5–96	REVISED PAD DIMENSIONS	PV/TL

APPROVED 3/1994

ENGR. MANAGER

ENGINEERING STANDARD

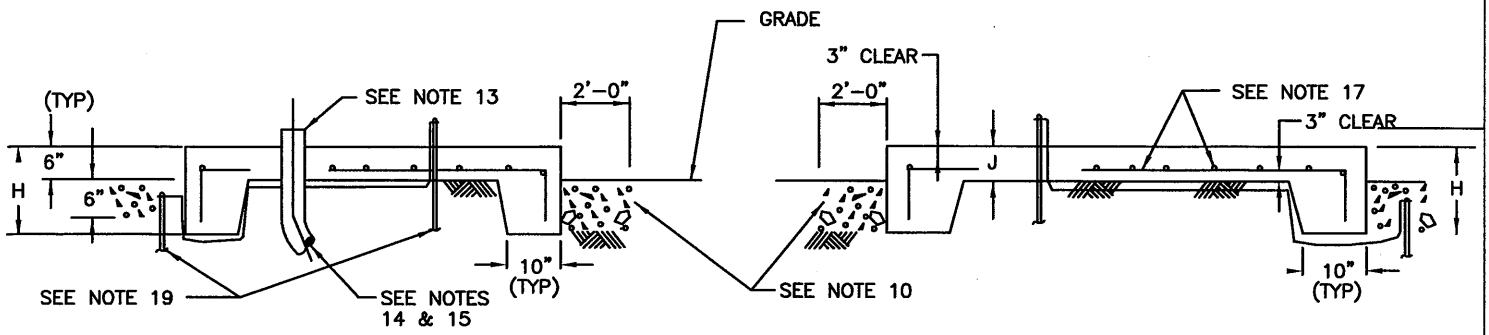
CONCRETE TRANSFORMER PAD

ENGR	PEV	
DRAWN	UES/MJ	MJ
CHECKED	PEV	

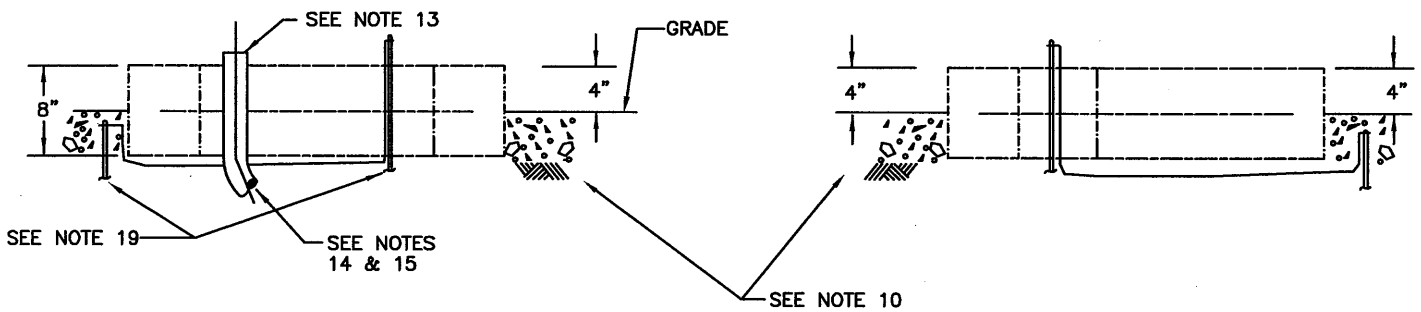
CITY OF PALO ALTO
CALIFORNIA

NTS	DT–SS–C–1005	1 OF 4
SCALE	STANDARD NO.	SHEET NO.

SECTION A — SECTION B

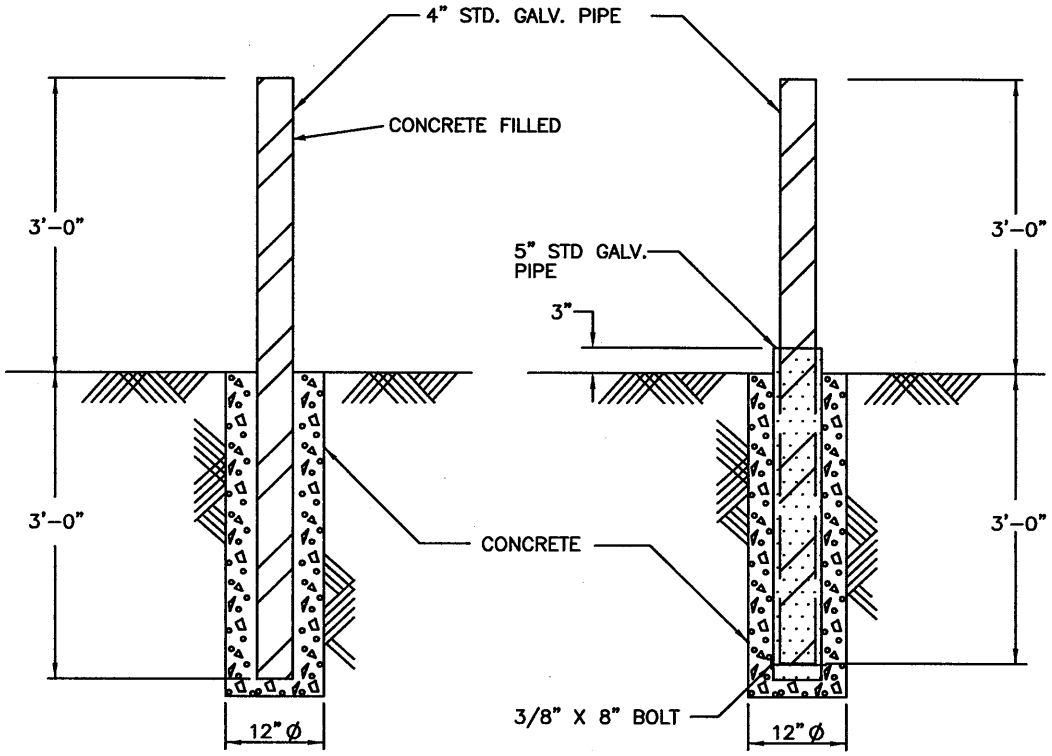


DETAILS FOR PADS POURED IN PLACE



DETAILS FOR PRECAST PADS

APPROVED 3/1994	ENGINEERING STANDARD	5	2-09	GENERAL REVISION	TT
mDBland	CONCRETE TRANSFORMER PAD	4	7-99	REVISED NOTES / ADDED NOTE 19	TF/SF
ENGR. MANAGER		3	2-88	GENERAL NOTES	
		REV	DATE	DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO	NTS	DT-SS-C-1005	2 OF 4
DRAWN UES/MJ MJ	CALIFORNIA	SCALE	STANDARD NO.	SHEET NO.
CHECKED PEV				



DETAIL 1
PERMANENT GUARD POST

DETAIL 2
REMOVABLE GUARD POST

USE REMOVABLE GUARD POSTS WHEN INSTALLED LESS THAN 8 FEET IN FRONT OF EQUIPMENT DOORS OR WHERE PERMANENT POSTS WOULD OBSTRUCT ACCESS FOR INSTALLATION OR MAINTENANCE.

GUARD POST INSTALLATION MUST BE COORDINATED WITH CONDUIT INSTALLATION TO AVOID CONFLICTS.

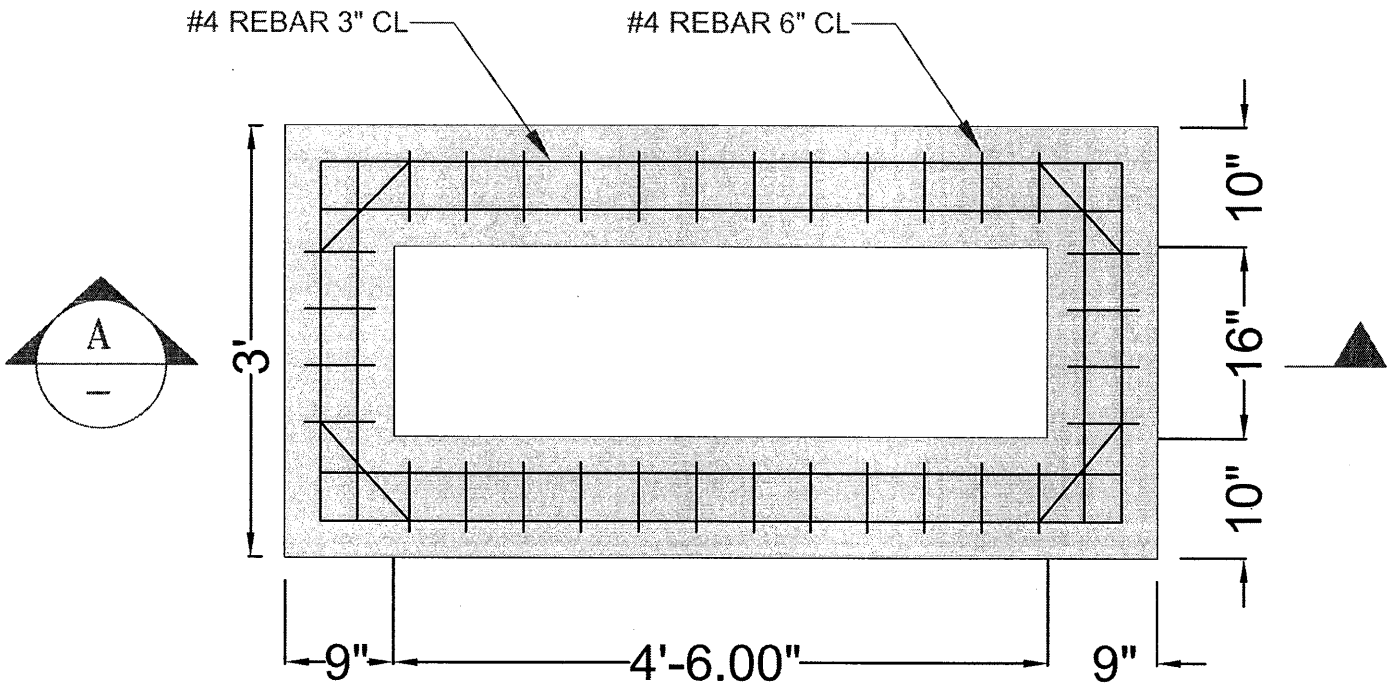
CONTACT CPAU ENGINEERING FOR GUARD POST PLACEMENT LOCATIONS DETAIL.

APPROVED 3/1994	ENGINEERING STANDARD					
mDBland	CONCRETE TRANSFORMER PAD	5	2-09	GENERAL REVISION	TP	
ENGR. MANAGER		3	2-88	GENERAL REVISION		
		REV	DATE	DESCRIPTION	APPR	
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS		DT-SS-C-1005	3 OF 4	
DRAWN UES/MJ MJ		SCALE		STANDARD NO.	SHEET NO.	
CHECKED PEV						

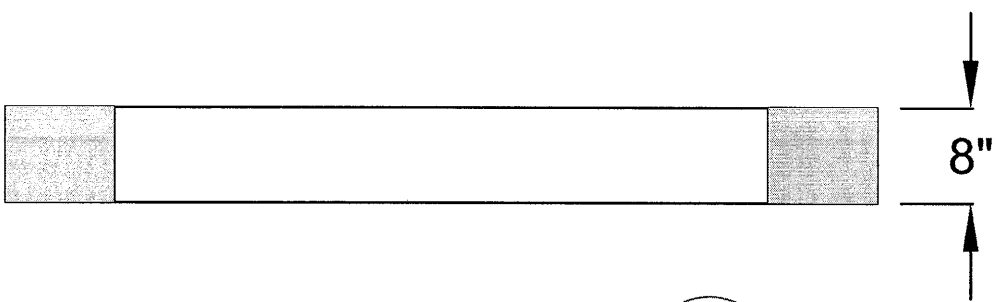
NOTES

1. DISTURBED EARTH UNDER THE PAD SHALL BE REPLACED BY SAND OR OTHER SUITABLE MATERIAL COMPACTED TO 95% OF MAXIMUM DRY DENSITY (ASTM D-1557).
2. CONCRETE IS REQUIRED BETWEEN ALL CONDUITS, LEVEL TO TOP OF THE PAD.
3. CONCRETE SHALL BE DESIGNED TO ATTAIN A STRENGTH OF 3000 PSI IN 28 DAYS.
4. AFTER PLACING, MOIST CURE CONCRETE FOR 7 DAYS BEFORE PLACING EQUIPMENT.
5. WOOD FLOAT FINISH TOP OF SLAB. ALL EDGES AND CORNERS ARE TO BE FINISHED SMOOTH.
6. EXPOSED HORIZONTAL SURFACES ARE TO BE SLOPED SLIGHTLY FOR DRAINAGE.
7. A MINIMUM OF 6 FEET SHALL BE MAINTAINED BETWEEN GROUND RODS.
8. CAP ALL CONDUITS.
9. CONTACT CPAU FOR APPROVED PRE-CAST TRANSFORMER PADS.
10. PADS NOT SECURED IN PLACE BY CONCRETE OR ASPHALT SHALL HAVE A 2' WIDE BY 6" DEEP STRIP OF 90% COMPACTED GRAVEL ALONG ALL EDGES.
11. A MINIMUM OF 3 FEET OF RADIAL CLEARANCE BETWEEN THE TRANSFORMER PAD AND ANY OTHER STRUCTURE SHALL BE PROVIDED (SEE NOTE 21).
12. IF THE TRANSFORMER IS TO BE LOCATED IN AN AREA SUBJECTED TO VEHICULAR TRAFFIC, BARRIERS SHALL BE PROVIDED IN ACCORDANCE WITH DETAIL 1 OR 2 ON SHEET 2. CONTACT CPAU ENGINEERING OR UG INSPECTOR FOR THE TYPE, NUMBER REQUIRED, AND LOCATION OF BARRIERS.
13. PLASTIC CONDUITS SHALL BE TERMINATED WITH END BELLS. GALVANIZED STEEL CONDUITS SHALL BE TERMINATED WITH GROUND BUSHINGS. ALL CONDUITS AND ENDS WILL BE TO THE FINAL GRADE OF THE PAD.
14. CONDUIT RISER BENDS SHALL HAVE A MINIMUM RADIUS OF 36".
15. PRIMARY CONDUITS SHALL BE LOCATED IN THE LEFT HALF OF THE CONDUIT OPENING. SECONDARY CONDUITS SHALL OCCUPY THE RIGHT HALF. (SEE SHEET 1)
16. CLEARANCE AROUND THE TRANSFORMER PAD SHALL BE PER CPAU STANDARD DWG. DT-CL-U-1031.
17. ALL REBAR SHALL BE A-615 GRADE 40. REBAR JOINTS SHALL BE FIRMLY AND SECURELY HELD IN POSITION BY WIRING AT INTERSECTIONS WITH NO. 16 GAUGE WIRE.
18. THE MAXIMUM NUMBER OF CONDUITS ENTERING THE SECONDARY SLOT SHALL BE FOUR. CONTACT THE ELECTRIC UTILITY PROJECT ENGINEER FOR DESIGNS REQUIRING MORE THAN FOUR SECONDARY CONDUITS.
19. GROUND ROD AND CLAMP, 5/8" X 8'. SEE CPAU STANDARD DWG. # DT-SS-U-1001 FOR MATERIALS INFORMATION.
20. TRANSFORMER ANCHORS SHALL BE INSTALLED BY CPAU ACCORDING TO MANUFACTURER'S INSTRUCTIONS. EXPANSION BOLT SHALL BE "PARABOLT" BY MOLY OR APPROVED EQUIVALENT. MINIMUM EMBEDMENT LENGTH AND EDGE DISTANCE SHALL MEET THE MANUFACTURER'S REQUIREMENTS.
21. A MINIMUM OF 8 FEET CLEARANCE SHALL BE MAINTAINED FROM THE FRONT OF THE PAD FOR OPERATIONAL NEEDS. A MINIMUM OF 3 FEET SHALL BE MAINTAINED ON UNOPERABLE SIDES AND BACK. ALL MEASUREMENTS ARE TAKEN FROM THE EDGE OF THE PAD. SEE CPAU ENGINEERING STANDARD DT-CL-U-1031.
22. UNLESS OTHERWISE APPROVED BY CPAU, A BOX SHALL BE INSTALLED NEXT TO THE TRANSFORMER PAD. PRIMARY CONDUITS ENTERING THE PAD WILL FIRST GO TO THIS BOX. REFER TO APPLICABLE LAYOUT DRAWING FOR LOCATION AND SIZE. SEE CPAU STANDARD DWG. # DT-SS-U-1002 FOR BOX INSTALLATION DETAILS.

APPROVED 3/1994 mDBland ENGR. MANAGER	ENGINEERING STANDARD CONCRETE TRANSFORMER PAD	5	2-09	GENERAL REVISION		JT
		4	7-99	REVISED NOTES / ADDED NOTE 19		TF/SF
		3	2-88	GENERAL NOTES		
		REV	DATE	DESCRIPTION		APPR
ENGR PEV / DRAWN UES/MJ MJ / CHECKED PEV	CITY OF PALO ALTO CALIFORNIA	NTS		DT-SS-C-1005		4 OF 4
		SCALE		STANDARD NO.		SHEET NO.



PLAN



SECTION A — —

NOTES:

1. PLACE 6" OF 3/4" DRAIN ROCK, BASE ROCK OR COMPACTED SAND UNDER N52 (30"X60") CHRISTY OR APPROVED EQUAL BOX WITH A POURED 1" BASE.

2. PAD CONSTRUCTION SHALL BE PER STD # DT-SS-C-1005. IF A PRE-CAST PAD AS SIZED ABOVE IS USED, YOU DO NOT NEED THE FOOTING THICKNESS AS SHOWN ON STD DWG# DT-SS-C-1005 SH 1 OF 3.

3. PLACE PAD WINDOW CENTERED WITH THE BOX.

ENGINEERING STANDARDS

APPROVED 7/1994
M. BEANNANE
SR. ENGINEER / MANAGER
Original Signed and Approved by Engineering Manager

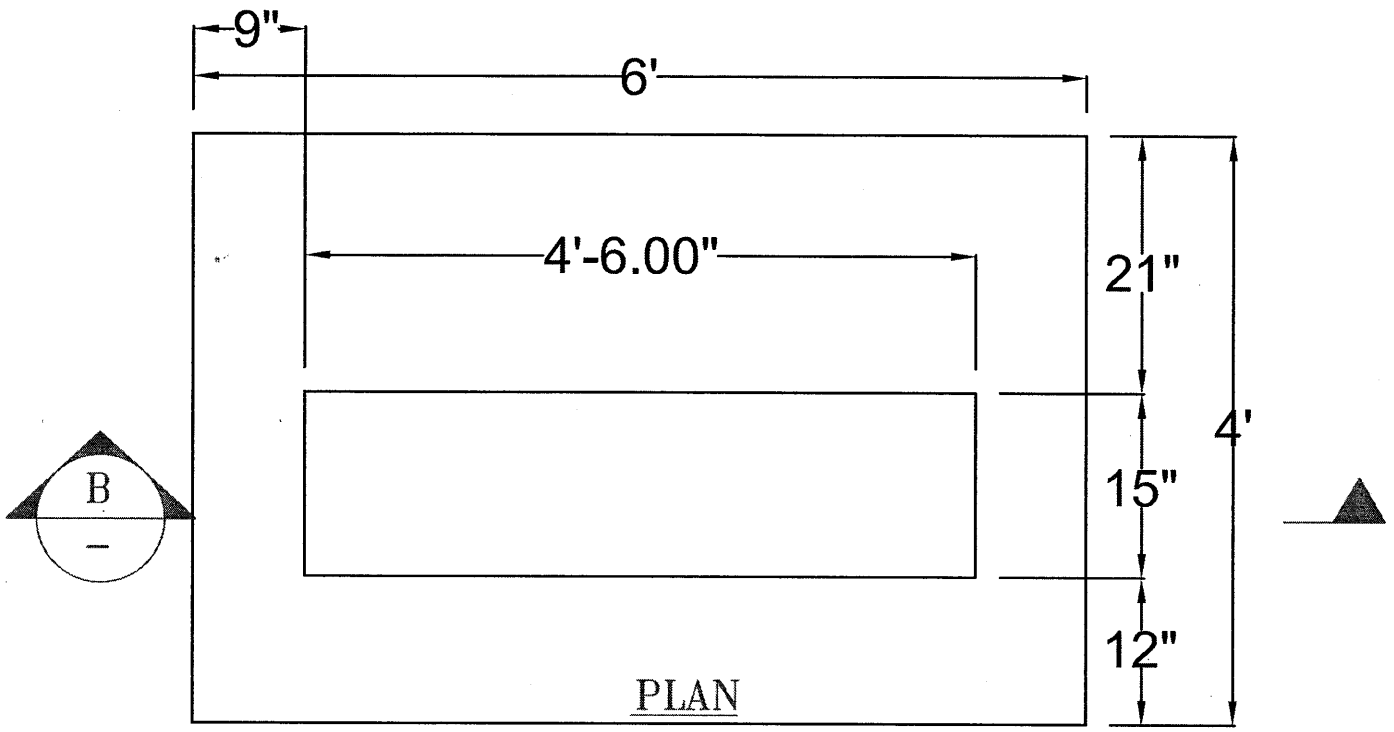
ENGR.	P. VARATH	
DRWN	D. WHEET.	
CHKD.	X	

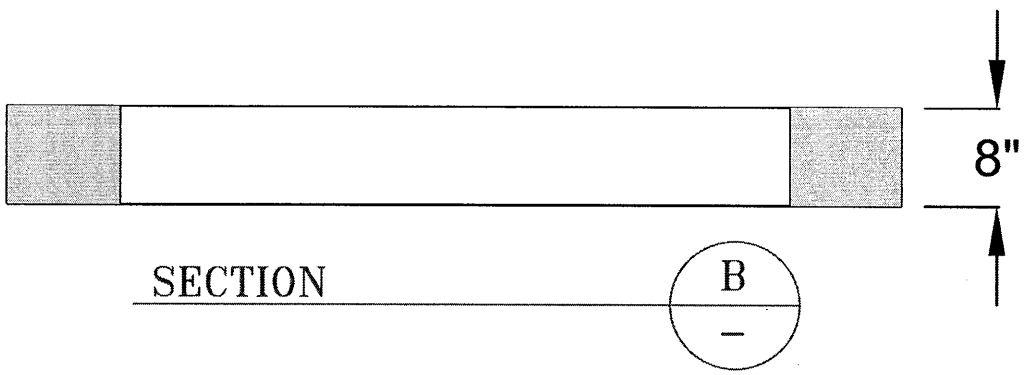
PRE-CAST CONCRETE PAD FOR LBC CABINET

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION

MAP #	CKT #	SCALE	W.O.# / DRAWING #
X	X	NTS	DT-SS-C-1028
			SHEET 1 OF 2





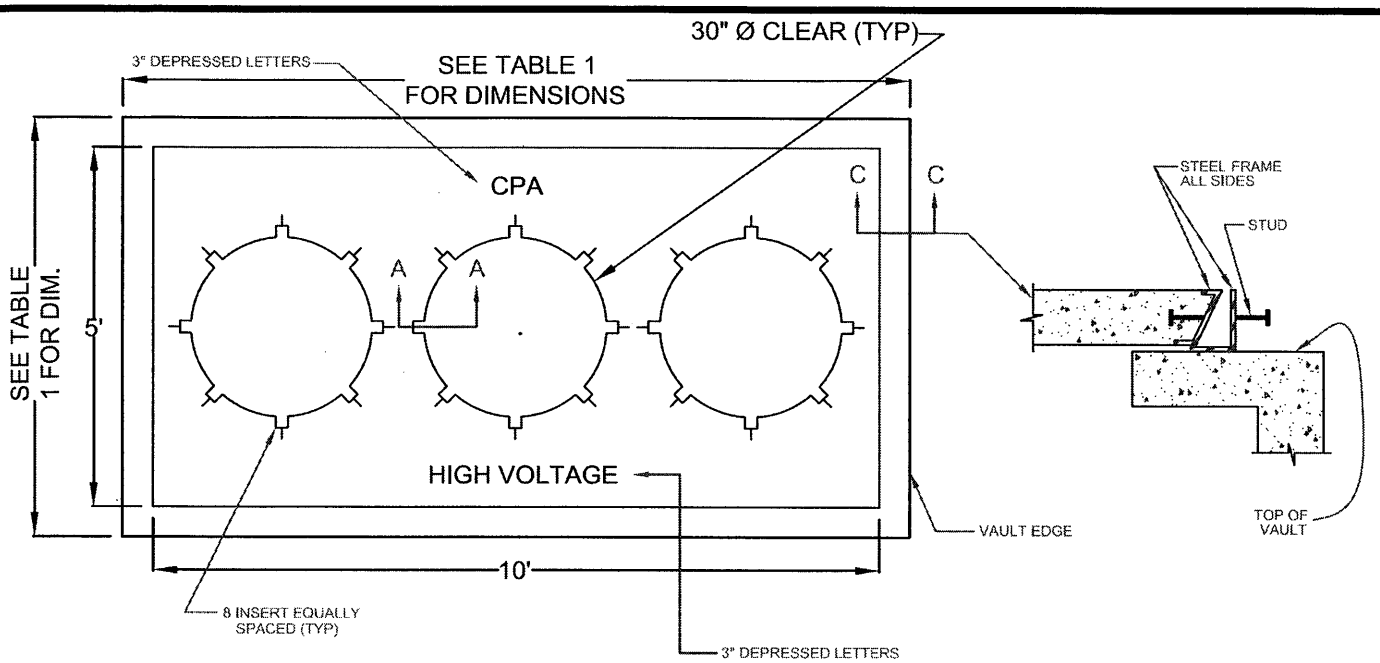
NOTES:

1. PLACE 6" OF 3/4" DRAIN ROCK, BASE ROCK OR COMPACTED SAND UNDER 4'X6' BOX.

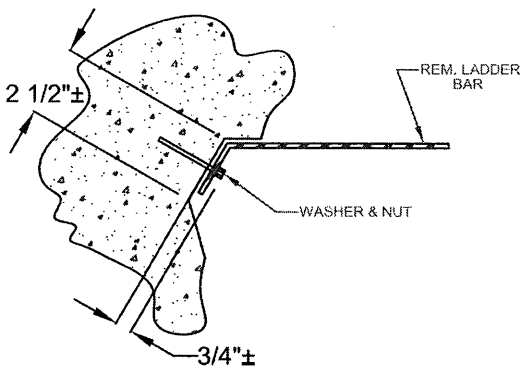
2. PLACE PAD CENTERED OVER BOX.

ENGINEERING STANDARDS

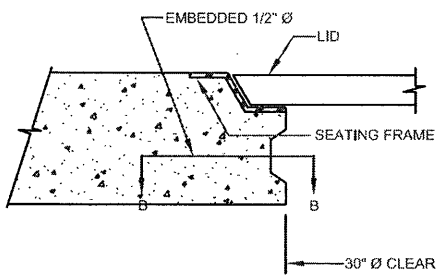
APPROVED 7/1994 M. BEARLAND SR. ENGINEER/MANAGER (Original Signed and Approved by Engineering Manager)	PRE-CAST CONCRETE PAD FOR LBC CABINET	REV.	DATE / APPR. / DESCRIPTION
ENGR. J. KLATH	City of Palo Alto California	MAP #	X
DRWN. DANIEL T.	UTILITIES, ELECTRIC ENGINEERING	CKT #	X
CHKD. X		SCALE	NTS
		W.O.# / DRAWING #	DT-SS-C-1028
		SHEET	2 OF 2



VAULT COVER–TO SHOW THE LOCATION OF 8 INSERTS

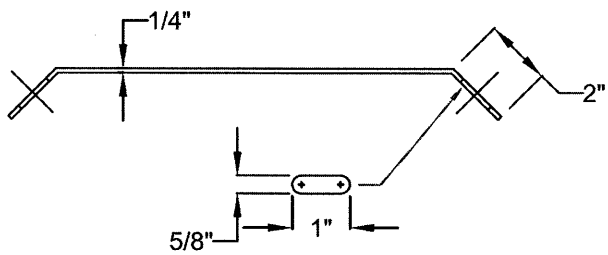


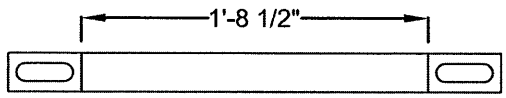
SECTION B–B



LOCAL RECCESS IN CONC. COVER FOR EMBEDDED 1/2" Ø THREADED INSERT, RADIALLY ORIENTED TO RECEIVE LADDER BAR, W/ GALVANIZED WASHER & HEX. NUT.

SECTION A–A





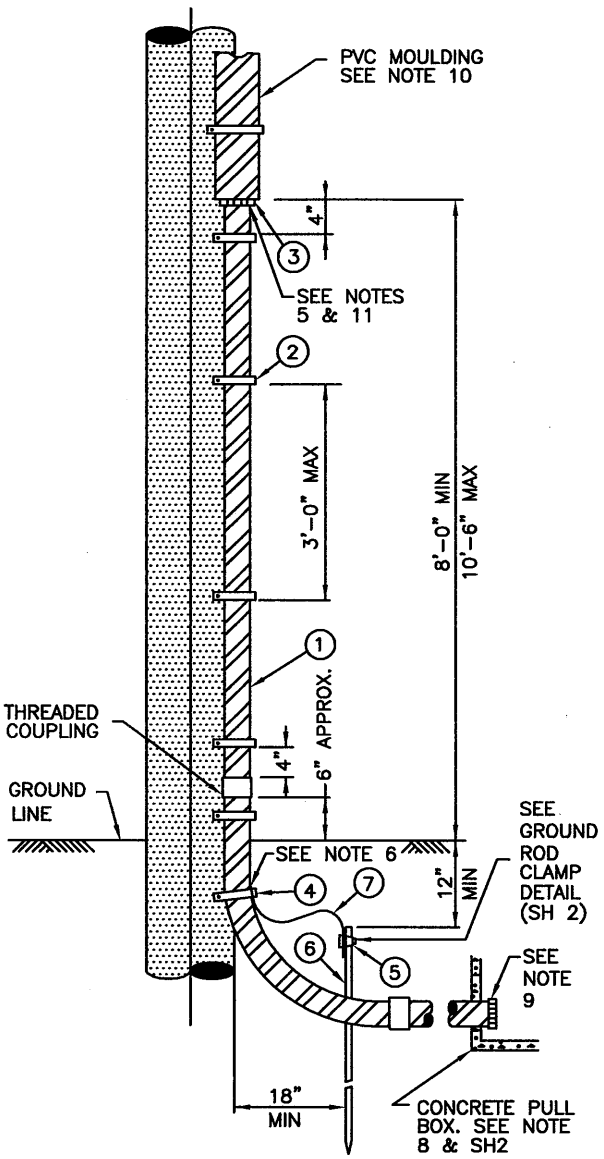
REMOVABLE LADDER BAR

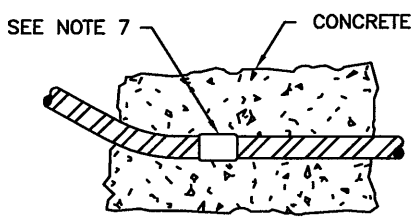
ENGINEERING STANDARDS

APPROVED 3/1[illegible]94	# VAULT COVER WITH LADDER BAR		
Original Signed and Approved by Engineering Manager			
ENGINEERING MANAGER			
DSGN. [illegible]	City of Palo Alto California		
DRWN. DANIEL T.	UTILITIES, ELECTRIC ENGINEERING		
CHKD. REV			

REV.	DATE	APPR.	DESCRIPTION

MAP #	CKT #	SCALE	W.O.# / DRAWING #
X	X	NTS	DT-SS-C-1029
			SHEET 1 OF 1





NON-METALLIC DUCT
CONCRETE ENCASED

NOTES:

1 THIS DWG. ILLUSTRATES THE INSTALLATION REQUIREMENTS FOR RIGID STEEL RISER CONDUIT ON WOOD POLES. THESE REQUIREMENTS APPLY TO RISER INSTALLATIONS OF ALL VOLTAGES.

2 THE RISER CONDUIT SHALL BE LOCATED IN A QUADRANT ON THE POLE AS MARKED BY THE ELECTRIC UTILITY REP.

3 THE MIN RADIUS ALLOWED IN THE BEND SHALL BE 36" FOR PRIMARY CONDUIT. UNLESS OTHERWISE SPECIFIED BY THE ELECTRIC UTILITY. A FACTORY BEND MAY BE USED FOR SECONDARY CONDUIT.

4 NO WELDING, BRAZING OR TORCH CUTTING SHALL BE MADE ON THE RISER CONDUIT. THE HEAT WILL DESTROY THE GALVANIZED COATING ON THE CONDUIT.

5 ALL SECONDARY STEEL RISER (600 VOLTS OR LESS) CONDUIT SHALL HAVE AN INSULATING BUSHING AT THE TOP (ITEM-3)

6 ALL PRIMARY VOLTAGE RISER (600 VOLTS OR GREATER) CONDUIT SHALL HAVE A GROUNDING BUSHING (ITEM-4)

7 IF A TRANSITION FROM METALLIC TO NON METALLIC CONDUIT IS MADE, A FACTORY ADAPTER MUST BE USED SEE NOTE 9

8 UNLESS OTHERWISE APPROVED BY ELECTRIC UTILITY, A PRECAST BOX SHALL BE INSTALLED IN THE DUCT NEAR THE BASE OF THE RISER POLE. REFER TO THE APPLICABLE LAYOUT DWG. FOR THE EXACT LOCATION OF THE BOX. SEE DWG. NO. DT-SS-U-1002 FOR THE SIZE AND TYPE OF BOX REQUIRED. SEE SHEET NO. 2 FOR ALTERNATE GRD LOCATION.

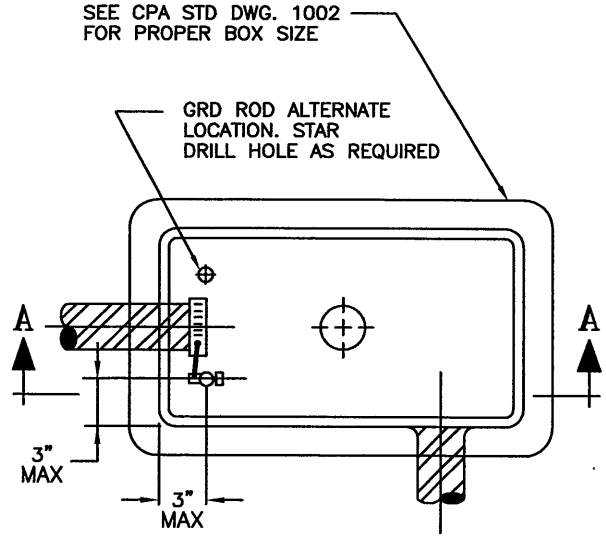
9 WHEN THE ALTERNATE GROUNDING LOCATION IS USED (SEE SHEET 2), THE RISER CONDUIT MUST BE A CONTINUOUS RUN OF GALVANIZED RIGID STEEL.

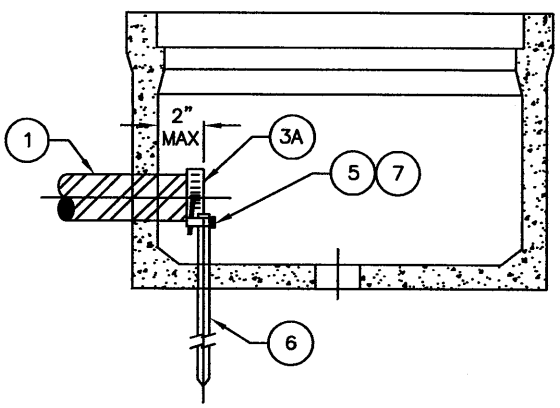
10 WHERE THE CUSTOMER FURNISHES & INSTALLS THE RISER CONDUIT, THE ELECTRIC UTILITY SHALL FURNISH AND INSTALL THE RISER MOLDING EXTENDING FROM THE RISER CONDUIT TO THE OVERHEAD CONDUCTOR LEVEL ON THE POLE.

11 ANY MATERIALS SUBSTITUTION MUST BE APPROVED IN ADVANCE BY THE ELECTRIC UTILITY.

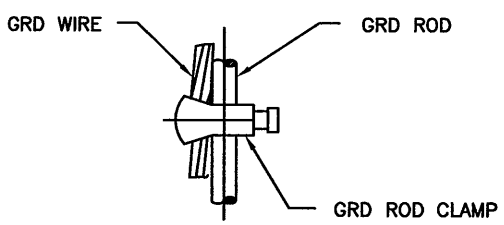
12 THE BEND OR SWEEP USED AT THE BOTTOM OF THE RISER CONDUIT SHALL BE RIGID GALVANIZED STEEL.

APPROVED 3/1994	ENGINEERING STANDARD	3	10-09	REVISED NOTES	TT
mDBland	INSTALLATION OF STEEL RISER CONDUIT ON WOOD POLES	2	4-86	REVISED NOTES	
ENGR. MANAGER		1	5-67	ADDED SHT 2 & REVISED MATL. LIST	
		REV	DATE	DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS	DT-SS-U-1001	1 OF 2
DRAWN UES/MJ MJ		SCALE	STANDARD NO.	SHEET NO.
CHECKED PEV				





SECTION A–A



GRD ROD CLAMP ASSY.

LIST OF MATERIALS

ITEM	DESCRIPTION	SIZE	MANUFACTURER	CAT. NO.
1	HOT DIPPED GALVANIZED RIGID STEEL CONDUIT	AS REQUIRED	–	–
2	GALVANIZED HANGER IRON USE 1/4" X 21/2" GALV. LAG SCREWS	NO.1 7/8" 16 GA	–	–
3	CONDUIT TOP GROUNDING BUSHING	2"	UNION INSULATING	96–2
			O–Z COMPANY	HBL–2021
		3"	UNION INSULATING	96–3
			O–Z COMPANY	HBL–3121
		4"	UNION INSULATING	96–4
			O–Z COMPANY	HBL–4121
		5"	UNION INSULATING	96–5
			O–Z COMPANY	HBL–5121
		6"	UNION INSULATING	96–6
			O–Z COMPANY	HBL–6121
		FOR SUBSTITUTE, SEE NOTE 11		
3A	CONDUIT BOTTOM GROUNDING BUSHING	2"	O–Z COMPANY	RBL–2021
		3"	O–Z COMPANY	RBL–3121
		4"	O–Z COMPANY	RBL–4121
		5"	O–Z COMPANY	RBL–5121
		6"	O–Z COMPANY	RBL–6121
4	CONDUIT GROUND CLAMP	FOR SUBSTITUTE, SEE NOTE 11		
		2"	O–Z COMPANY	CG 2022
			T & B COMPANY	3903
		3"	O–Z COMPANY	CG 3122
			T & B COMPANY	3904
		4"	O–Z COMPANY	CG 4122
			T & B COMPANY	3905
		5"	O–Z COMPANY	CG 5122
			T & B COMPANY	3905
		6"	O–Z COMPANY	CG 6122
			T & B COMPANY	3906
5	GROUND ROD CLAMP	DIA: 5/8" — WIRE SIZE: NO. 4 TO 2/0	ANDERSON ELEC. HUBBARD JOSLYN	GC 103 –01 6540 J8492AB
		DIA: 3/4" — WIRE SIZE: NO. 4 TO 2/0	LINE MATERIAL ELEC. WEAVER MATERIAL ELEC	WB 3/4 H WB 3/4 H
6	GROUND ROD	DIA: 5/8" — LENGTH: 8'–0"	BLACKBURN HUBBARD LINE MATERIAL JOSLYN	6258 9438 119952 J8338
		DIA: 3/4" — LENGTH: 12'–0"	HUBBARD LINE MATERIAL JOSLYN	9452 119961 J8352
7	STANDARD BARE COPPER WIRE	NO. 4 AWG MIN	–	–

APPROVED 3/1994

ENGR. MANAGER

ENGINEERING STANDARD

INSTALLATION OF STEEL RISER CONDUIT ON WOOD POLES

REV	DATE	DESCRIPTION	APPR
2	10–08	REVISED SECTION A–A	TT
1	5–67	REVISED MATL. LIST & ADDED SH 2	

ENGR	PEV	
DRAWN	UES/MJ	MJ
CHECKED	PEV	

CITY OF PALO ALTO
CALIFORNIA

NTS	DT–SS–U–1001	2 OF 2
SCALE	STANDARD NO.	SHEET NO.

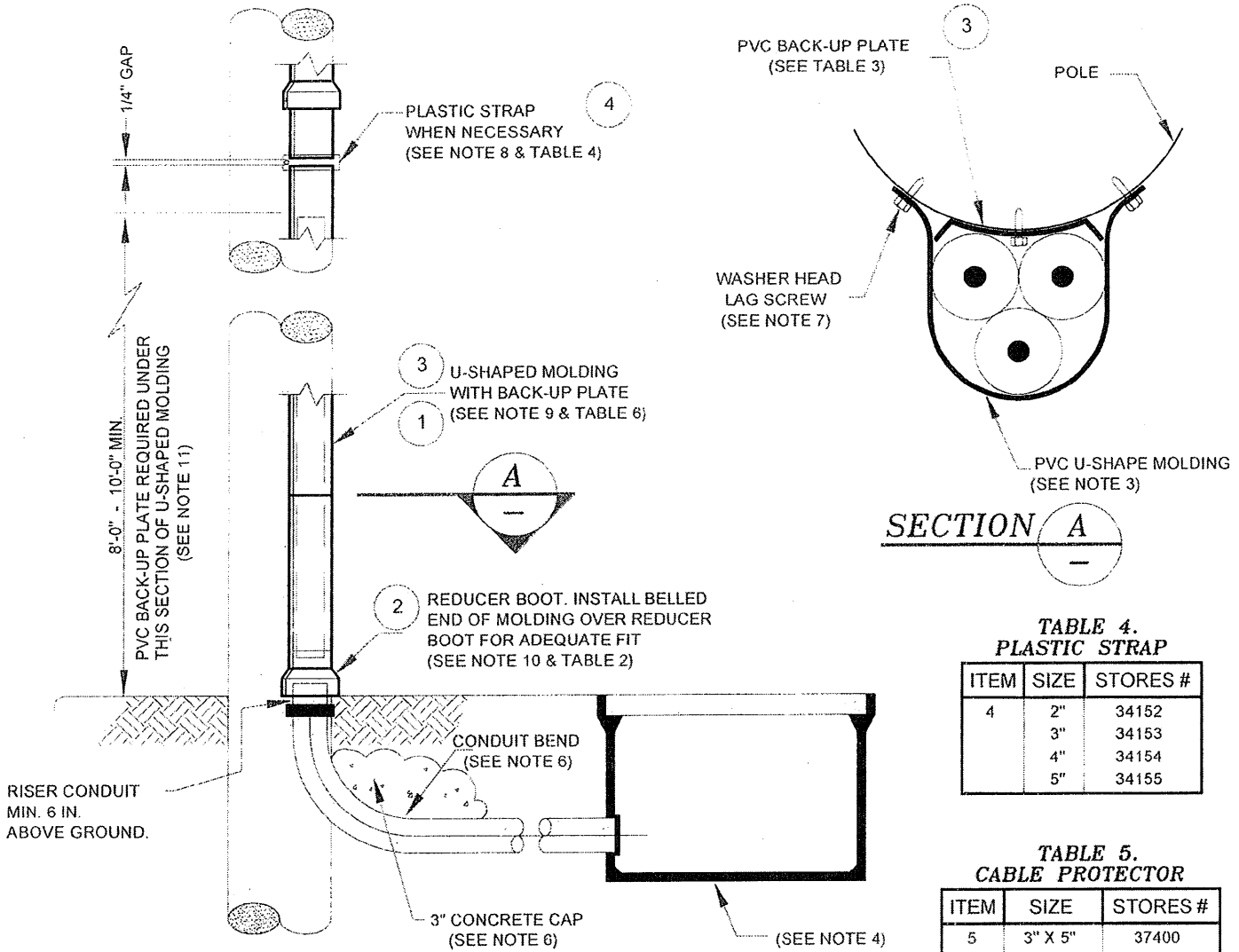


TABLE 4.
PLASTIC STRAP

ITEM	SIZE	STORES #
4	2"	34152
	3"	34153
	4"	34154
	5"	34155

TABLE 5.
CABLE PROTECTOR

ITEM	SIZE	STORES #
5	3" X 5"	37400
	2" X 2-1/2"	37401

TABLE 1.
U-SHAPED MOLDING

ITEM	SIZE	TYPE	STORES #
1	2"	SCH. 80	34122
	3"	SCH. 80	34123
	4"	SCH. 40	34124
	5"	SCH. 40	34125

TABLE 2.
REDUCER BOOT

ITEM	SIZE	STORES #
2	2" X 3"	34132
	4" X 2"	34133
	4" X 3"	34134
	5" X 4"	34135

TABLE 3.
BACKING PLATE

ITEM	SIZE	STORES #
3	2"	34142
	3"	34143
	4"	34144
	5"	34145

TABLE 6.
RECOMMENDED U-SHAPED MOLDING SIZES

VOLTAGE	CABLE SIZE AWG OR KCMIL	MOLDING SIZE
15 KV	#2 (2-3 COND.)	3"
	2/O (3 COND.)	4"
	350 (3 COND.)	4"
	500 (3 COND.)	5"
	750 (3 COND.)	5"
600 V	#2	2"
	1/O	2"
	4/O	2"
	350	2"
	500	3"
	750	3"

APPROVED 6/1994
Patrick E. Valath
SR. ENGINEER / MANAGER

ENGR.	J. Bujtor	JB
DRWN	M. Jamshid	MJ
CHKD.	P. Valath	PV

INSTALLATION OF PVC RISER CONDUIT ON WOOD POLES

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION
1	6/94	APPR.	DRAWING RENAMED
2	5/06	JSB	CONVERT'D TO A'CAD

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	DT-SS-U-1001A
			SHEET 1 OF 2

WOOD POLE RISER INSTALLATION NOTES

UNLESS OTHERWISE SPECIFIED, THIS CONSTRUCTION STANDARD SHALL BE USED FOR ALL WOOD POLE RISER INSTALLATION.
U-SHAPED PVC MOLDING SHALL BE MANUFACTURED FROM UNPLASTICIZED POLYVINYL CHLORIDE COMPOUND AND SHALL MEET THE REQUIREMENTS OF NEMA PUBLICATION PH 41-1986 AND NEMA PUBLICATION TC2-1983 AS APPROPRIATE.

FOR RISERS IN EXCESS OF 750 VOLTS G.O. 95 RULE 54.6E 1988 SPECIFIES THE USE OF A MOLDING THAT MEETS THE IMPACT TEST REQUIREMENTS OF EPC-80-PVC AND REQUIRING AN ADDITIONAL BACKUP PLATE OF PVC MATERIAL.
THE STANDARD SIZES USED SHALL BE 2", 3", 4", AND 5". TO COMPLY WITH THE IMPACT TEST REQUIREMENTS, 2" AND 3" SHALL BE SCHEDULE 80 AND THE 4" AND 5" SHALL BE SCHEDULE 40.

NOTES:

1. AS A MATTER OF CONVENIENCE THESE REQUIREMENTS SHALL APPLY TO PRIMARY AND SECONDARY RISER INSTALLATIONS ON WOOD POLES INCLUDING STREET LIGHT AND COMMUNICATIONS LINES.
2. THE RISER CONDUIT SHALL BE LOCATED IN A QUADRANT ON THE POLE AS DIRECTED BY THE ELECTRIC UTILITY.
3. THE TOP OF THE RISER SHALL HAVE A NYLON CABLE PROTECTOR.
4. UNLESS OTHERWISE APPROVED BY THE ELECTRIC UTILITY A NINETY DEGREE ELBOW AND A PRECAST BOX SIZE AS SPECIFIED SHALL BE INSTALLED AT THE BASE OF THE RISER POLE. REFER TO THE APPLICABLE LAYOUT DRAWING FOR THE EXACT LOCATION OF THE BOX.
5. ANY MATERIALS SUBSTITUTED MUST BE APPROVED BY THE ELECTRIC UTILITY PRIOR TO INSTALLATION.
6. UNLESS OTHERWISE SPECIFIED, THE BEND OR SWEEP USED AT THE BOTTOM OF THE RISER MOLDING FACTORY SHALL BE OF PVC SCHEDULE 40 MATERIAL AND SHALL BE CAPPED WITH CONCRETE (3" THICKNESS) ALONG THE INSIDE PORTION OF THE BEND.
   THE CONCRETE SHALL BE COLORED RED BY THE ADDITION OF MILLER'S RED OXIDE PIGMENT TO THE CONCRETE MIX.
   COLOR WILL BE THE SATISFACTION OF THE UTILITIES UNDERGROUND INSPECTOR.
7. THE U-SHAPED MOLDING SHALL BE ATTACHED TO THE POLE WITH 1/4" X 2" NEOPRENE WASHER HEAD LAG SCREWS AT 18" INTERVALS BELOW THE 8 FT. LEVEL AND AT 36" INTERVALS ABOVE THE 8 FT. LEVEL. THESE SCREWS SHOULD BE INSTALLED SNUG AGAINST THE MOLDING BUT NOT DRIVEN TIGHT IN ORDER TO PERMIT EXPANSION OF THE MOLDING DUE TO TEMPERATURE CHANGES.
8. IT IS ACCEPTABLE TO INSTALL A PLASTIC STRAP WHEN IT IS NECESSARY TO JOIN TWO SECTIONS OF MOLDING WITH PLAIN ENDS. A 1/4" SPACING MUST BE PROVIDED BETWEEN THE ENDS TO ALLOW FOR THERMAL EXPANSION.
9. ONE TEN FOOT SECTION OF PVC BACKUP PLATE SHALL BE FASTENED TO THE POLE AT THE LOWER SECTION OF THE RISER WITH 6d GALVANIZED NAILS.
10. USE REDUCER BOOTS TO JOIN DIFFERENT SIZED U-SHAPED MOLDINGS TOGETHER AND TO JOIN DIFFERENT SIZED U-SHAPED MOLDINGS TO CONDUIT BENDS. TWO REDUCER BOOTS MAY BE USED IN SERIES WHERE A DOUBLE REDUCTION IS REQUIRED.

APPROVED 6/1994
Patrick E. Valath
SR. ENGINEER / MANAGER

ENGR.	J. Bujtor	JB
DRWN	M. Jamshid	MJ
CHKD.	P. Valath	PV

INSTALLATION OF PVC RISER CONDUIT ON WOOD POLES

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION
1	6/94	APPR.	DRAWING RENAMED
2	5/06	JSB	CONVERT'D TO A'CAD

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	DT-SS-U-1001A
			SHEET 2 OF 2

THIS DRAWING PROVIDES INFORMATION ON THE INSTALLATION REQUIREMENTS, BOX TYPES, AND BOX SIZES ALLOWED BY THE CITY OF PALO ALTO UTILITIES (CPAU) FOR UNDERGROUND ELECTRIC UTILITY APPLICATION.

Box Manufacturer and Catalog Number			Inside Dimensions (Inches)									
Quazite Corporation	Christy Concrete Products, Inc.	Utility Vault Company	Length (A)	Width (B)	Depth (C)	Extension (D)	Voltage	Maximum Wire Size (AWG or kcmil)	Maximum # of Spliced or Looped Cables in Box	Maximum Conduit Size (Inches)	Maximum # of Conduits	Application
—	N-9 ■	—	17	10	12	10	Secondary	# 2	8 ♦	2	4	Traffic Signal, Street Light, or Communications ONLY
PG1324	N-30 ▲	—	24	13	18	8	Secondary	# 2	12 ♦	2	3	Pull box for secondary cables
PG1730	N-36 ▲	—	30	17	18	8	Secondary	4/0	12	2	3	Pull box for secondary cables
PG2436	N-40 ▲	—	36	24	18	8	Secondary	350	16 (2)	4	4	Pull box for secondary cables
PG3048	N-48 ▲	—	48	30	18	8	Secondary	500	24 (1)	4	6 ♦	Pull box for secondary cables
—	—	444-LA-CPA	42 (3' 6")	42 (3' 6")	42 (3' 6")		Secondary	750	24 (2)	4	6 ♦	REFERENCE ONLY — NOT APPROVED FOR NEW INSTALLATIONS – 200 A primary cables, single phase only – Under single phase transformer pads
							Primary	1/0	12	4	6	
—	—	CPA-3536	60 (5' 0")	36 (3' 0")	42 (3' 6")	6, 12	Secondary	750	24 (3)	4	6 ♦	– 200 A primary cables – 6 - 200 A Splices – Submersible Load Break – Pull box for 600 A primary cables
							Primary	350	12 (2)	4	4	
—	—	644-LA-CPA	66 (5' 6")	42 (3' 6")	39 (3' 3")	-----	Secondary	750	32 (2)	4	8 ●	– NOT Allowed in Full Traffic Applications – 2 sets - 200A or 600A splices – 4 way 200A Padmount Load Break Junction
							Primary	350	16 (3)	5	6	
—	—	577-LA-CPA	78 (6' 6")	48 (4' 0")	75 (6' 3")	-----	Secondary	750	32 (4)	4	12	– 1 Ph Submersible Transformer ≤ 100 kVA
							Primary	750	16 (2)	5	6	
—	—	CPA-4686	102 (8' 6")	54 (4' 6")	84 (7' 0")	6, 12	Secondary	750	32 (4)	4	14	– 6 - 600 A primary cables – 6 - 600 A splices or connectors – 3 way 200 A switch – Submersible Transformer ≤ 150 kVA
							Primary	750	16 (2)	5	6	
—	—	38Y-510-LA-CPA	120 (10' 0")	60 (5')	84 (7' 0")	-----	Secondary	750	32	4	16	– 6 - 600 A primary cables – 6 - 600 A primary splices or connectors – 600 A Switch – Submersible Transformer ≤ 300 kVA
							Primary	750	16 (3)	5	6	
—	—	38Y-612-LA-CPA	144 (12' 0")	72 (6' 0")	84 (7' 0")	-----	Secondary	750	32	4	16	– 6 - 600 A primary cables – 6 - 600 A primary splices or connectors – 600 A Switch – Submersible Transformer ≤ 750 kVA – Padmount Switch
							Primary	750	16 (3)	5	6	

LEGEND:

■ For Traffic Signal, Streetlight, or Communications ONLY

▲ For Use in Substations ONLY

♦ No more than 4 of maximum size

● No more than 6 of maximum size

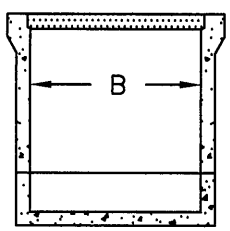
(1) No more than 1-set of maximum size (set = 4 conductors)

(2) No more than 2-sets of maximum size (set = 4 conductors)

(3) No more than 3-sets of maximum size (set = 4 conductors)

(4) No more than 4-sets of maximum size (set = 4 conductors)

BOX DIMENSIONS



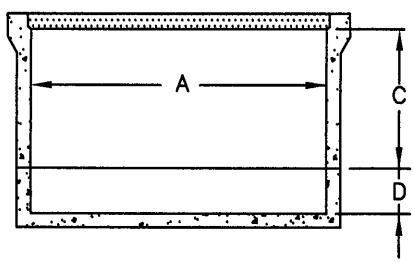


TABLE 1 – BOX TYPE, SIZE, & APPLICATION

REV	DATE	DESCRIPTION	APPR
6	1-09	REVISED	TT
5	3-95	REVISED	PV/MJ
4	7-89	REVISED	DH
3	5-89	REVISED	TL
2	2-86	REVISED	PV
1	4-87	REVISED & REDRAWN	EJM

APPROVED 3-1994

ENGR. MANAGER

ENGR	PEV	
DRAWN	UES/MJ	MJ
CHECKED	PEV	

ENGINEERING STANDARD

UNDERGROUND JUNCTION BOXES

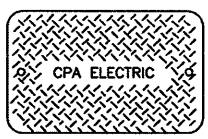
CITY OF PALO ALTO
CALIFORNIA

SCALE	STANDARD NO.	SHEET NO.
NTS	DT-SS-U-1002	1 OF 3

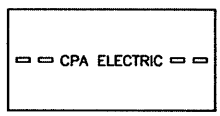
TABLE 2 – COVER TYPES BY APPLICATION

Manufacturer and Catalog Number		
Box	Application/Cover Type	Catalog Number
Utility Vault Company		
444-LA-CPA	Full Traffic	444 Roof Slab with inside-outside frame assembly and one (1) 30" manhole frame and cover
	Transformer (1-phase)	Pad size as required by transformer
644-LA-CPA	Non-Traffic, Submersible Load Break Junction	Aluminum Adjustable Frame with torsion assist slip resistant covers (3'6" x 5'6")
	Full Traffic - ONLY allowed with CPAU Approval	644 Roof Slab with inside-outside frame assembly and one (1) 30" manhole frame and cover
	Load Break Cabinet (60" wide)	Load Break Pad (48" x 72" x 8")
	Load Break Cabinet (44" wide)	Load Break Pad Type 2, with A-1252 Cover (48" x 72" x 8")
577-LA-CPA	Full Traffic	577 Roof Slab with inside-outside frame assembly and two (2) 30" manhole frames and covers
	Non-Traffic	Incidental Quick Release Slip Resistant Aluminum Plates & Adjustable Frame Assembly
	Submersible Transformer	Precast Roof Slab - Tapered Lift Out Cover with Two (2) 30" Grated Cast Iron Covers
CPA-3536	Full Traffic	Full Traffic Rectangular Splice Cover/Frame Assembly with Rectangular Covers
	Non-Traffic	CPA Adjustable Frame with Torsion Assist Cover Assembly
CPA-4686	Non-Traffic	Incidental Quick Release Slip Resistant Aluminum Plates & Adjustable Frame Assembly
	Full Traffic	Full Traffic Cover/Frame Assembly with Three (3) Rectangular Covers
	600A Switch, 600 A Splices or Separable Connectors - TRAFFIC	Full Traffic Cover/Frame Assembly with Three (3) Rectangular Covers
	600A Switch, 600 A Splices or Separable Connectors - NON-TRAFFIC	Incidental Quick Release Slip Resistant Aluminum Plates & Adjustable Frame Assembly
	Submersible Transformer	CPA Heavy FVT Frame (5") & CPA 24"x29" Grated Cast Iron Cover
38Y-510-LA-CPA	Submersible Switch	Precast Roof Slab - Tapered Lift Out Cover with Three (3) 30" SoCover Cast Iron Covers
	Submersible Transformer	Precast Roof Slab - Tapered Lift Out Cover with Three (3) 30" Grated Cast Iron Covers
	Switch (Type A)	711-CPA Switch Pad Roof Slab Type A
	Switch (Type B)	711-CPA Switch Pad Roof Slab Type B
	Switch (Type C)	711-CPA Switch Pad Roof Slab Type C
38Y-612-LA-CPA	Switch	Precast Roof Slab - Tapered Lift Out Cover with Three (3) 30" SoCover Cast Iron Covers
	Three Phase Transformer	Precast Roof Slab - Tapered Lift Out Cover with Three (3) 30" Grated Cast Iron Covers

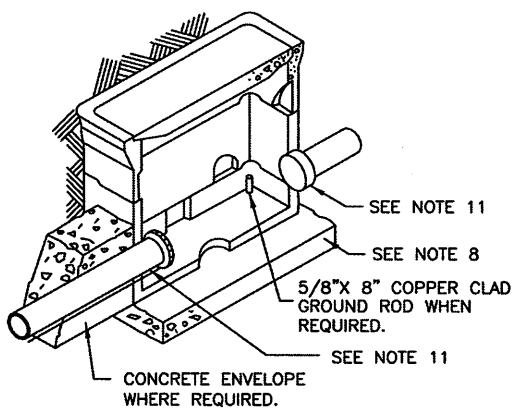
Manufacturer and Catalog Number		
Box	Cover Type	Catalog Number
Quazite Corporation		
PG1324	Heavy Duty w/ 2 Bolts	PG1324HA00
PG1730	Heavy Duty w/ 2 Bolts	PG1730HA00
PG2436	Heavy Duty w/ 2 Bolts	PG2436HA00
PG3048	Heavy Duty w/ 2 Bolts	PG3048HA00
Christy Concrete Products, Inc.		
N-9	Non-Traffic - Concrete	N9T
	Traffic - Steel	N9-61J
N-30	Non-Traffic - Concrete	N30T
	Traffic - Steel	N30-61J
N-36	Non-Traffic - Concrete	N36T
	Traffic - Steel	N36-61J
N-40	Non-Traffic - Concrete	N40T
	Traffic - Steel	N40-61J
N-48	Non-Traffic - Concrete	N48T
	Traffic - Steel	N48-61J



STEEL COVER



PLAIN COVER



TYPICAL BOX/CONDUIT INSTALLATION

REV	DATE	DESCRIPTION	APPR
5	1–09	REVISED	TT
4	3–95	REVISED	PV/MJ
3	7–89	REVISED	DH
2	4–86	REVISED	PV
1	4–78	REVISED & REDRAWN	EJM

APPROVED 3–1994

ENGR. MANAGER

ENGINEERING STANDARD

UNDERGROUND JUNCTION BOXES

ENGR	PEV	
DRAWN	UES/MJ	MJ
CHECKED	PEV	

CITY OF PALO ALTO
CALIFORNIA

NTS	DT-SS-U-1002	2 OF 3
SCALE	STANDARD NO.	SHEET NO.

NOTES

1. UNUSUAL FIELD CONDITIONS MAY DICTATE BOX DIMENSIONS FOR DESIGNS DIFFERENT FROM THOSE SPECIFIED IN THIS DRAWING. THE DETAILS FOR INSTALLATIONS VARYING FROM THESE SPECIFICATIONS WILL BE FURNISHED BY ELECTRIC UTILITY.
2. ALL BOXES SHALL BE COMPLETE WITH BODY, COVER, SOLID BASE, AND NECESSARY EXTENSIONS.
3. ALL NON-CONCRETE ENCLOSURES (BODY, BASE, COVER, AND EXTENSIONS WHERE REQUIRED) SHALL MEET TIER 15 REQUIREMENTS AS SPECIFIED IN SCTE 77 2007 (OR LATEST VERSION) AND PER CPAU SPECIFICATION SS-01-09 - SPECIFICATION FOR NON-CONCRETE ENCLOSURES .
4. THE NUMBER OF EXTENSIONS REQUIRED IS DEPENDENT ON THE DEPTH OF THE CONDUIT. THE CONDUIT SHALL ENTER THE BOX PARALLEL WITH THE COVER.
5. ALL NON-ROUND COVERS ON ALL BOXES MUST BE SECURED BY RECESSED HOLD-DOWN BOLTS.
6. ALL BOXES 42"X42" AND LARGER SHALL HAVE COVERS APPROVED BY CPAU.
7. THE WORDS "CPA ELECTRIC", "CPA SL", "CPA TS", OR "CPA COMM" SHALL BE CAST OR INSCRIBED IN THE SURFACE OF ALL COVERS, 30"X48" AND SMALLER DEPENDING ON APPLICATION. LARGER BOXES SHALL HAVE "CPA-HIGH VOLTAGE" INSCRIBED ON THE FRAME.
8. THE BASE OF EACH BOX SHALL BE PLACED ON A 6" BEDDING OF 3/4" CLASS 2 AGGREGATE ON UNDISTURBED OR 95% COMPACTED EARTH. THE BOXES SHALL BE INSTALLED SO THE COVERS ARE LEVEL WITH THE ADJACENT CURB, DRIVEWAY, OR SIDEWALK GRADE.
9. FOR 30"X48" OR SMALLER BOXES, AN ALLOWANCE SHALL BE MADE FOR THE THICKNESS OF THE COVER TO ENSURE THE COVER IS FLUSH WITH THE FINISH GRADE. WHEN NO FINISH GRADE IS ESTABLISHED, BOX COVERS SHALL BE 2" ABOVE THE ADJACENT TERRAIN.
10. IT IS INTENDED THAT CONDUITS SHALL ENTER CONCRETE BOXES THROUGH THE KNOCKOUTS PROVIDED. BOX WALL MAY BE CUT OR CORE DRILLED AT OTHER LOCATIONS TO PROVIDE CONDUIT ENTRY.
11. STEEL CONDUITS SHALL EXTEND NO MORE THAN 2" INTO A BOX AND SHALL BE TERMINATED WITH GROUNDING BUSHINGS. PLASTIC CONDUITS SHALL BE TERMINATED WITH BELL ENDS, FLUSH WITH THE WALL OF THE BOX. BELL ENDS MAY NOT PROJECT INTO THE BOX. ALL CONDUIT ENTRANCES SHALL BE GROUTED.
12. USE STEEL TRAFFIC COVERS WHERE CONCRETE BOXES MUST BE LOCATED IN DRIVEWAYS OR OTHER AREAS SUBJECT TO LIGHT VEHICULAR TRAFFIC. BOXES USED IN HEAVY TRAFFIC AREAS SHALL BE DESIGNED FOR H-20-44 TRAFFIC LOADING.
13. ALL BOXES LISTED IN TABLE 1 SHALL BE SIZED FOR THE LARGEST CONDUCTOR THEY ARE EXPECTED TO CONTAIN.
14. FOR BOX INSTALLATION AT THE BASE OF A POLE RISER, SEE CPAU DWG. NUMBER DT-SS-U-1001.
15. UNLESS APPROVED BY THE UTILITY ELECTRIC ENGINEER, THE DEPTH OF A BOX MAY NOT EXCEED ITS LENGTH.

REV	DATE	DESCRIPTION	APPR
5	1-09	REVISED	TT
4	3-95	REVISED	PV/MJ
3	7-89	REVISED	DH
2	4-86	REVISED	PV
1	4-78	REVISED & REDRAWN	EJM

APPROVED 3-1994

ENGR. MANAGER

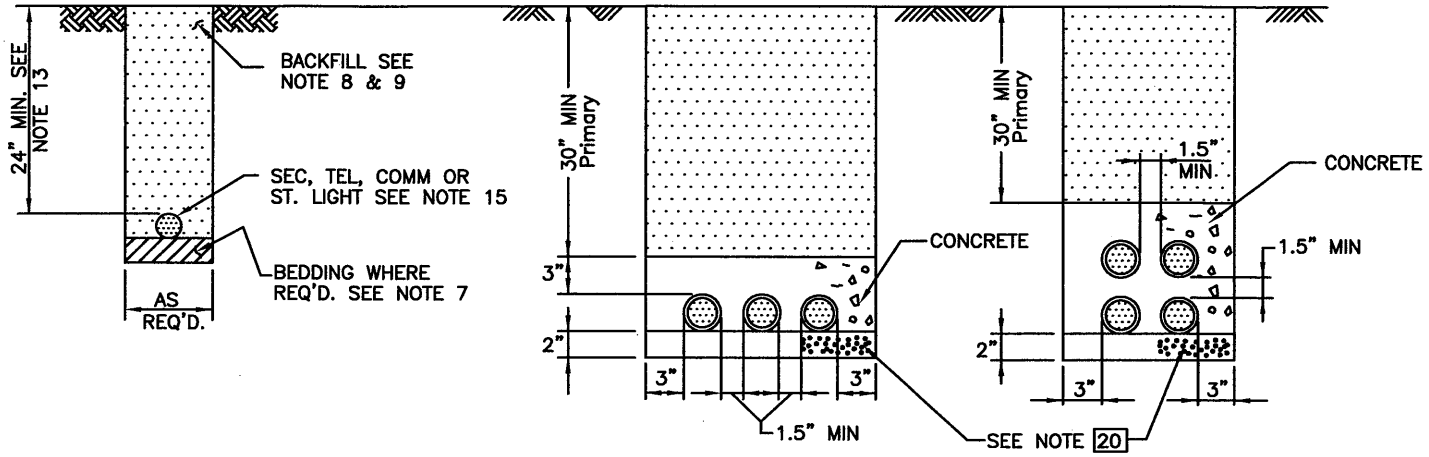
ENGINEERING STANDARD

UNDERGROUND JUNCTION BOXES

ENGR	PEV	
DRAWN	UES/MJ	MJ
CHECKED	PEV	

CITY OF PALO ALTO
CALIFORNIA

NTS	DT-SS-U-1002	3 OF 3
SCALE	STANDARD NO.	SHEET NO.



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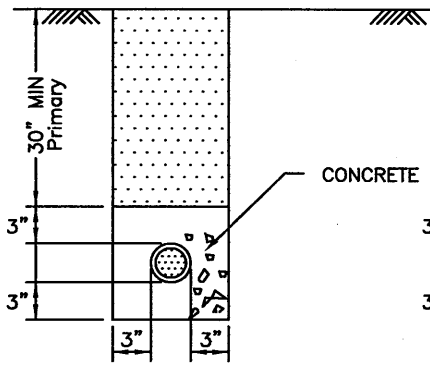
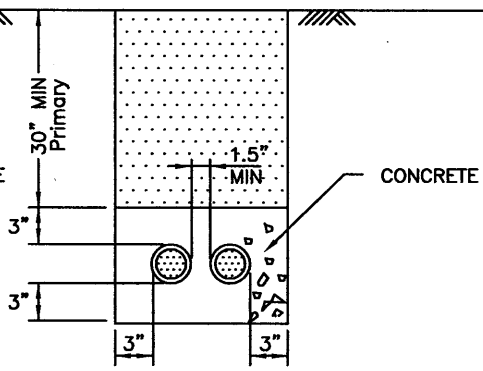


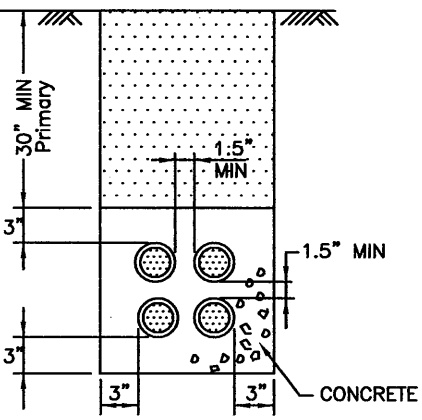
1-WAY DUCT BEAM

12" X 12" RACEWAY



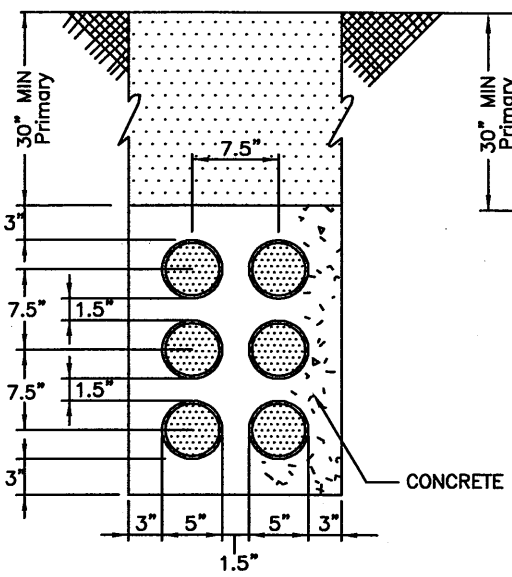
2-WAY DUCT BEAM

20" X 12" RACEWAY



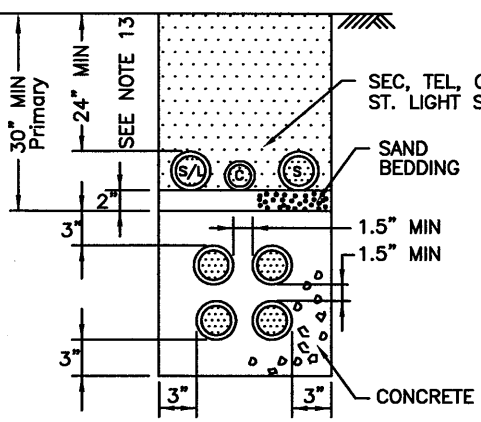
4-WAY DUCT BEAM

20" X 20" RACEWAY

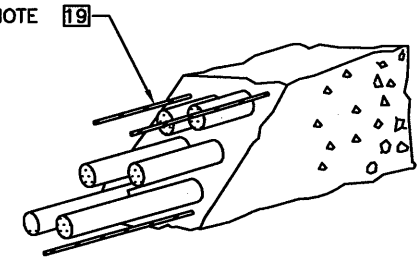


6-WAY DUCT BEAM

19 1/2" X 27" RACEWAY



TYPICAL DUCT BEAM

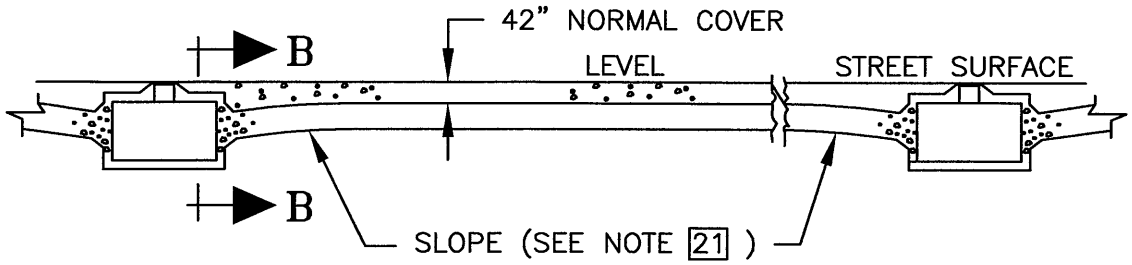


PERSPECTIVE VIEW

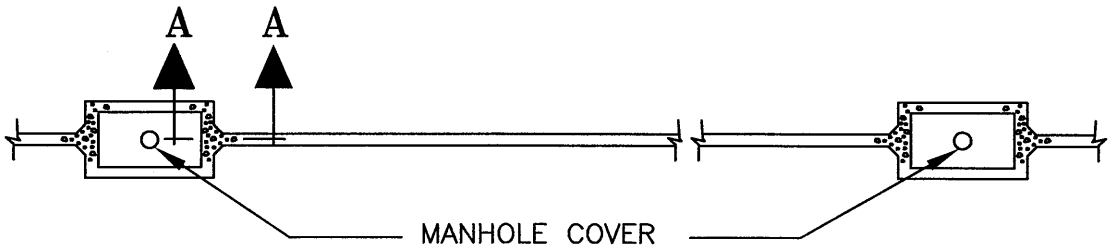
APPROVED 20	ENGINEERING STANDARD		
ENGR MANAGER	UNDERGROUND DUCT LINES		
ENGR TT	TYPICAL TRENCH SECTION DETAILS		
DRAWN MD	CITY OF PALO ALTO	NTS	DT-SS-U-1003 1 OF 4
CHECKED PV	CALIFORNIA	SCALE	STANDARD NO. SHEET NO.

Original Signed and Approved by Engineering Manager

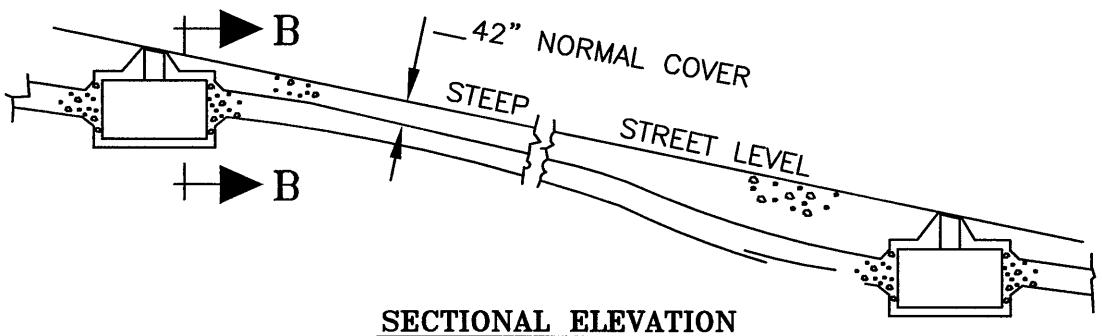
REV	DATE	DESCRIPTION	APPR
3	10/09	REVISED MIN PRIMARY COVER	TT
2	8/08	COMBINED DT-SS-U-1003 DT-PR-U-1004	TT
1	6/06	REVISED NOTES	JT



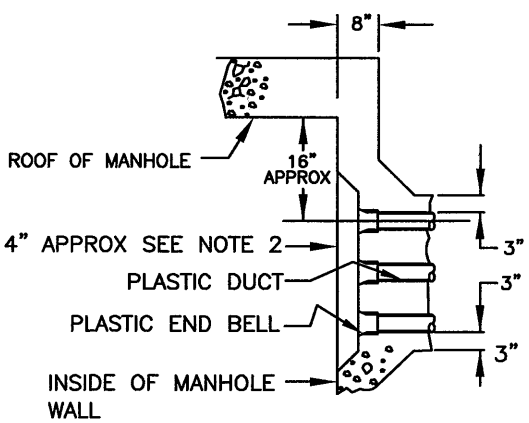
SECTIONAL ELEVATION



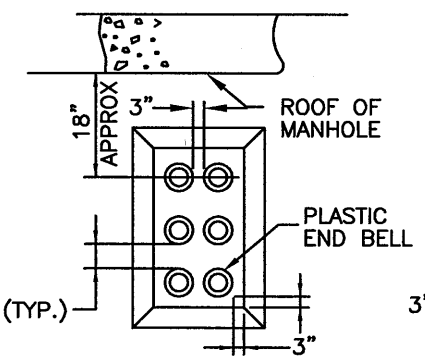
PLAN VIEW



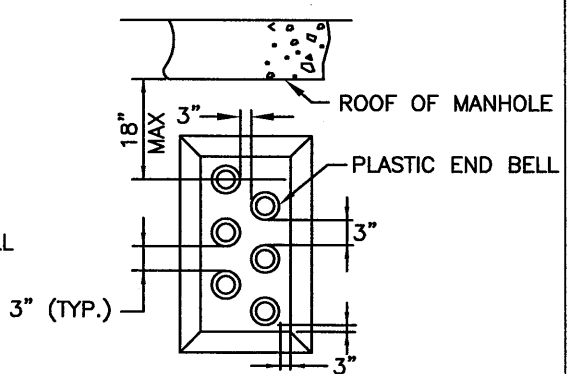
SECTIONAL ELEVATION



SECTION A–A



ALT. SECTION B–B
DUCT WINDOW



SECTION B–B
DUCT WINDOW

APPROVED 20	ENGINEERING STANDARD	4	8–08	COMBINED DT–SS–U–1003 DT–PR–U–1004	TT
ENGR. MANAGER	UNDERGROUND DUCT LINES	3	7–99	REVISED NOTES 1, 2, 5	FINCH
ENGR. TT	TYPICAL TRENCH SECTION DETAILS	2	6–90	CHANGED NOTE 2	
DRAWN MD		REV	DATE	DESCRIPTION	APPR
CHECKED PV	CITY OF PALO ALTO CALIFORNIA	NTS		DT–SS–U–1003	2 OF 4
		SCALE		STANDARD NO.	SHEET NO.

Original Signed and Approved by Engineering Manager

NOTES:

1. DIRECT BURIED PRIMARY CONDUIT IS NOT AN APPROVED CONSTRUCTION METHOD. PRIMARY CONDUITS SHALL BE CONCRETE ENCASED, UNLESS OTHERWISE APPROVED BY UTILITIES ENGINEER.

2. JOINT TRENCH WITH NATURAL GAS OR PRIVATE STREETLIGHT SYSTEMS IS NOT ALLOWED UNLESS APPROVED BY CITY OF PALO ALTO UTILITIES ELECTRIC AND WATER, GAS, WASTEWATER ENGINEERING DEPARTMENTS.

3. APPROVED CONDUIT MATERIALS:
   a. SCHEDULE 40 PVC
   b. TYPE "DB 60" (SECONDARY) OR "DB 120" (PRIMARY) PLASTIC CONDUIT
   c. HOT DIPPED GALVANIZED RIGID STEEL CONDUIT.

4. EVERY EFFORT MUST BE MADE TO OBTAIN A STRAIGHT WATER–TIGHT CONDUIT LINE TRUE TO THE CENTER LINE OF THE TRENCH.

5. SHARP TURNS MUST BE AVOIDED. THE MINIMUM ELBOW RADIUS ALLOWED SHALL BE 2' RADIUS ELBOWS FOR 2" CONDUITS, 3' RADIUS ELBOWS FOR 4" CONDUIT, 5' RADIUS ELBOWS FOR 5" CONDUIT, AND 3' RADIUS ELBOWS FOR ALL RISERS. UNLESS APPROVED BY THE PROJECT ENGINEER, FACTORY OFFSETS SHALL NOT BE USED.

6. ALL BENDS AND SWEEPS (90 DEGREES) MUST BE ENCASED IN CONCRETE (MINIMUM 3") ALONG THE INSIDE RADIUS.

7. IF THE ELECTRIC UNDERGROUND INSPECTOR DETERMINES THAT THE BOTTOM OF THE TRENCH IS ROCKY, A 2" SAND BEDDING MUST BE INSTALLED BEFORE THE CONDUIT.

8. EXCAVATED NATIVE SOIL MAY BE USED FOR GENERAL BACKFILL IN UNIMPROVED AREAS.

9. IN IMPROVED AREAS (STREETS, UNDER SIDEWALKS, ETC.) THE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE CITY OF PALO ALTO STANDARD SPECIFICATIONS FOR BACKFILLING IN IMPROVED AREAS (SECTION 21).

10. ALL CONDUITS MUST BE MANDRELLED (STND. DWG DT–SS–U–1025). THIS TEST MUST BE WITNESSED BY THE ELECTRIC UNDERGROUND INSPECTOR.

11. A 3/8" POLYPROPYLENE PULL LINE (MIN. 150 LBS. TEST) MUST BE INSTALLED IN EACH CONDUIT.

12. CONDUIT SPACING SHALL BE MAINTAINED BY SPACERS, APPROVED BY THE CITY OF PALO ALTO, INSTALLED NO MORE THAN 7 FEET APART. CONDUITS MUST BE SECURELY BOUND TO THE SPACERS.

13. MINIMUM COVER FOR DIRECT BURIED CONDUIT:

a.	SECONDARY (NON TRAFFIC)	24"
b.	COMMUNICATION (NON TRAFFIC)	24"
c.	SECONDARY (TRAFFIC)	30"
d.	COMMUNICATION (TRAFFIC)	30"

14. MINIMUM CLEARANCE OF ELECTRIC LINES FROM OTHER UTILITY LINES:

a.	VERTICAL CLEARANCE FROM CROSSING UTILITY LINES	12"
b.	HORIZONTAL CLEARANCE FROM NATURAL GAS LINES	24"
c.	HORIZONTAL CLEARANCE FROM WATER/WASTEWATER LINES	48"

15. HORIZONTAL SPACING BETWEEN JOINTLY INSTALLED SECONDARY, COMMUNICATION, TELEPHONE, AND STREETLIGHTING CABLES OR CONDUIT MAY BE RANDOM UNLESS OTHERWISE SPECIFIED.

16. THE CONCRETE SHALL BE READY–MIXED, CLASS B PORTLAND CEMENT CONCRETE, CONTAINING 3 SACKS OF CEMENT PER CUBIC YARD. THE CONCRETE SHALL BE COLORED RED BY THE ADDITION OF RED OXIDE PIGMENT TO THE CONCRETE MIX. COLOR WILL BE TO THE SATISFACTION OF THE ELECTRIC UNDERGROUND INSPECTOR.

APPROVED ____ 20	ENGINEERING STANDARD	7	10/09	ADDED NOTE 14	TT
Original Signed and Approved by Engineering Manager	UNDERGROUND DUCT LINES	6	5–09	COMBINED DT–SS–U–1003 DT–PR–U–1004	TT
ENGR. MANAGER	TYPICAL OPEN CUT TRENCH SECTION DETAILS	5	6–99	MODIFIED NOTES	JT
		REV	DATE	DESCRIPTION	APPR
DSGN TT	CITY OF PALO ALTO	NTS		DT–SS–U–1003	3 OF 4
DRAWN MD	CALIFORNIA	SCALE		STANDARD NO.	SHEET NO.
CHECKED PV					

NOTES:

17. DURING CONCRETING, THE DUCTS SHALL BE HELD SECURELY IN PLACE WITH STAKES, PLASTIC SPACERS, ETC. WOODEN TIE–DOWN STAKES SHALL BE REMOVED IMMEDIATELY AFTER THE CONCRETE IS POURED.

18. BENDS IN DUCT LINES SHALL BE OF MAXIMUM PRACTICAL RADIUS.

19. WHEN A BREAK IS MADE IN THE POURING OF THE DUCT BEAM, A 3–FOOT LONG 5/8" DIA STL RE–BAR SHALL BE INSERTED HORIZONTALLY AT EACH CORNER OF THE DUCT BEAM, LEAVING 18" TO TIE INTO THE SUBSEQUENT POUR.

20. THE SEMI–ENCASED CONSTRUCTION IS A RESTRICTED INSTALLATION AND USED ONLY WITH THE ENGINEER'S APPROVAL. IF THE BOTTOM OF THE TRENCH IS ROCKY, USE SAND BACKFILL AND TAMP TO A SMOOTH BED WITH 95% COMPACTION.

21. SLOPE TO BE 3" IN 100 FT, IF POSSIBLE OR 1" IN 100 FT MIN. ON LEVEL GROUND, SLOPE DUCT LINE FROM CENTER TO EACH MANHOLE.

22. VERTICAL STAGGERING OF DUCT IN THE VAULT WINDOW, SHOWN IN SECTION B–B, ON SHEET 2, IS PREFERRED.

23. HORIZONTAL DIRECTIONAL BORING IS ALLOWED FOR INSTALLATION OF SECONDARY AND PRIMARY CONDUITS ONLY WHEN APPROVED BY UTILITY ELECTRIC ENGINEER.

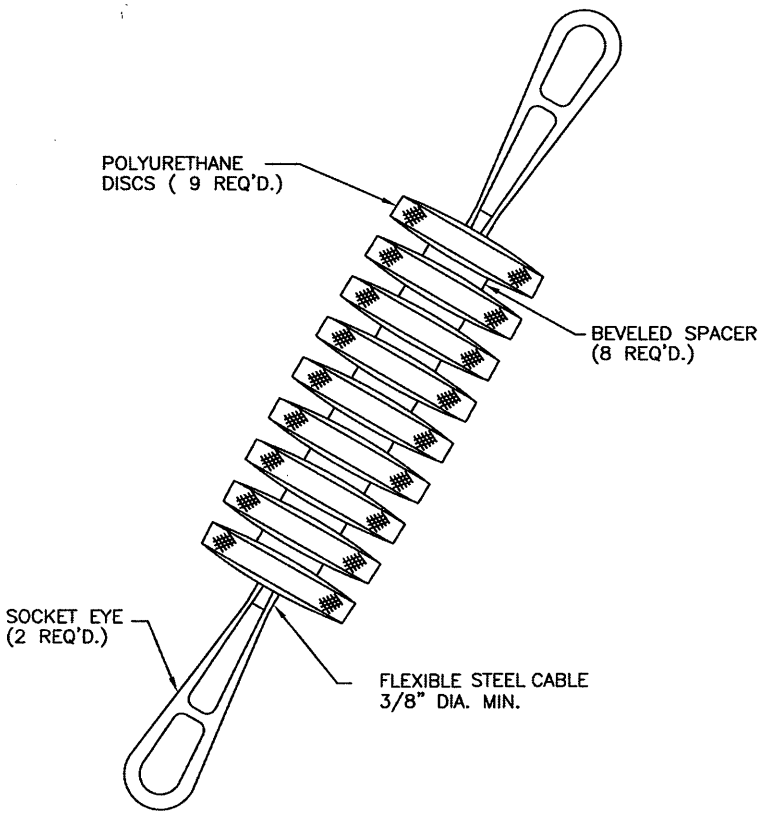
24. DIRECTIONAL BORING WILL NOT BE ALLOWED IF IN THE OPINION OF UTILITY ENGINEERING OR THE ELECTRIC UNDERGROUND INSPECTOR, THE EXISTING FACILITIES OR OTHER CONFLICTS CREATE NAVIGATIONAL PROBLEMS.

25. ALL UTILITY COVER AND SEPARATION REQUIREMENTS MUST BE MET FOR THE ENTIRE LENGTH OF THE BORE RUN. SEE ITEM #13, 45" MINIMUM COVER FOR PRIMARY CONDUIT. UTILITY EASEMENTS MUST BE HONORED.

26. POTHOLING MUST BE DONE AT KEY LOCATIONS, AS PER THE INSTRUCTIONS OF THE ELECTRIC UNDERGROUND INSPECTOR, PRIOR TO COMMENCING HORIZONTAL DIRECTIONAL BORING.

27. A THOROUGH INVESTIGATION SHALL BE PERFORMED TO IDENTIFY KNOWN UTILITY SYSTEMS PARALLELING OR CROSSING THE PROPOSED BORE ROUTE.

APPROVED____ 20	ENGINEERING STANDARD	6	6–08	COMBINED DT–SS–U–1003 DT–PR–U–1004		TT
Original Signed and Approved by Engineering Manager	UNDERGROUND DUCT LINES	5	6–09	MODIFIED NOTES		JT
ENGR. MANAGER	TYPICAL TRENCH SECTION DETAILS	4	7–99	MODIFIED NOTES		FINCH
		REV	DATE	DESCRIPTION		APPR
ENGR. TT	CITY OF PALO ALTO	NTS		DT–SS–U–1003		4 OF 4
DRAWN MD	CALIFORNIA	SCALE		STANDARD NO.		SHEET NO.
CHECKED PV						



DUCT SIZE	MANDREL SIZE *	SAFE WORKING LOAD * *
1-1/2"	1-1/4	1400
2-0"	1-3/4"	2330
3-0"	2-3/4"	2330
4-0"	3-3/4"	4800
5-0"	4-3/4"	4800
6-0"	5-3/4"	4800

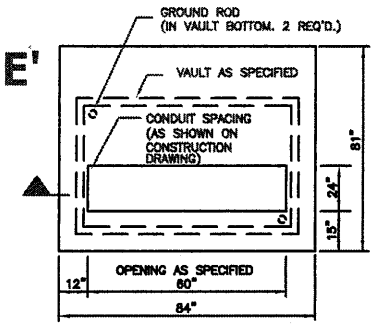
NOTES:

1. THE FLEXIBLE MANDREL IS CONSTRUCTED OF POLYURETHANE DISCS OF GRADUATED SIZES STRUNG ON A CABLE 3/8" MINIMUM DIAMETER SEPARATED BY BEVELED SPACERS AND EQUIPpED WITH DROP-FORGED STEEL SOCKET EYES ON EACH END.
2. REMOVE SHARP EDGES FROM EACH DISC TO AVOID DAMAGE TO THE DUCT.
3. ALL TESTING SHALL BE WITNESSED BY THE ELECTRIC UNDERGROUND INSPECTOR.
4. ALL CONDUITS, NEW OR EXISTING, SHALL BE TESTED AND APPROVED PRIOR TO INSTALLATION OF ANY CABLES.

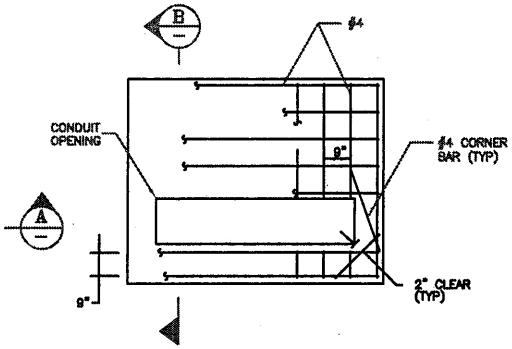
* OUTSIDE DIAMETER OF THE 3 CENTER DISCS.
* * SAFETY FACTOR (HORIZONTAL PULL ONLY.)

APPROVED ____ 99	ENGINEERING STANDARD				
Original Signed and Approved by Engineering Manager	MANDREL TESTING				
ENGR. [illegible] NAGER		1	11/08	ADDED NOTE 3 & 4	TT
ENGR. PEV		REV	DATE	DESCRIPTION	APPR
DRAWN HGS	CITY OF PALO ALTO	NTS		DT-SS-U-1025	
CHECKED PEV	CALIFORNIA	SCALE		STANDARD NO.	SHEET NO.

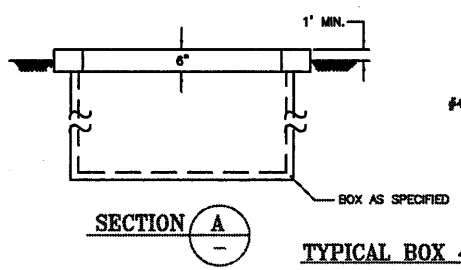
TYPE 'E'

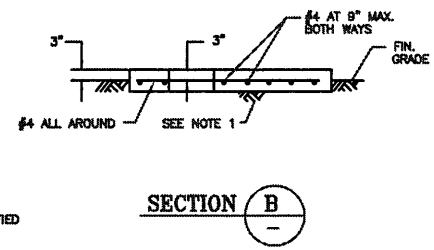


CONCRETE PAD DIMENSIONS



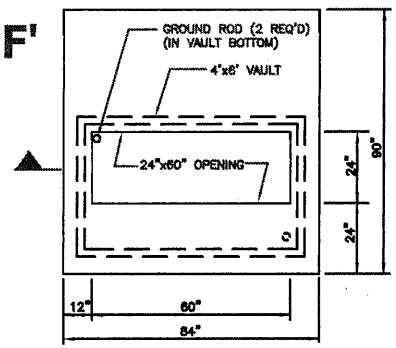
REINFORCING BAR LAYOUT



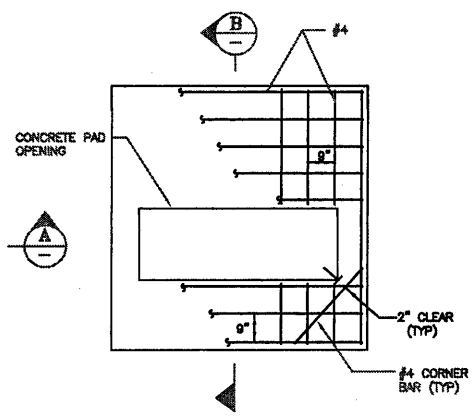


TYPICAL BOX 4' X 6' X 6'

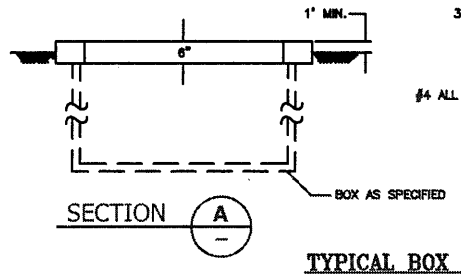
TYPE 'F'

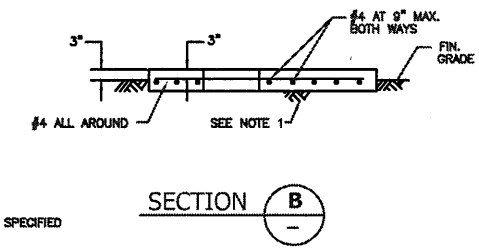


CONCRETE PAD DIMENSIONS



REINFORCING BAR LAYOUT





TYPICAL BOX 4' X 6' X 6'

NOTES:

1. TWO OF THE GROUND RODS MUST BE CONNECTED TOGETHER, BY BARE COPPER #2 STRANDED WIRE, AND RUN UP THROUGH THE CABLE WINDOW AND CONNECTED TO THE NEUTRAL.
2. ALL CONDUIT MUST BE CAPPED.
3. ALL SIDES MUST BE CLEAR FOR SWITCH DOOR SWING, SWITCH HANDLE OPERATION AND THE USE OF A HOT STICK OR BAYONET. MINIMUM CLEARANCES AROUND CONCRETE PAD ARE 3' FROM THE BACK AND SIDES AND 10' FROM THE FRONT. THESE CLEARANCES WILL BE CHECKED BY THE ELECTRICAL ENGINEERING.
4. GROUND ROD MUST BE 5/8" X 8' PER CITY OF PALO ALTO ENGINEERING DRAWING DT-SS-U-1001.
5. SWITCHGEAR MUST BE ANCHORED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. IF THE SWITCHGEAR IS LOCATED NEAR AN AREA SUBJECT TO VEHICULAR TRAFFIC, BARRIERS MUST BE PROVIDED IN ACCORDANCE WITH DETAIL 1 OR 2 ON SHEET 2 OF 3, CPA ENGINEERING STANDARD DT-TR-C-1005. CITY OF PALO ALTO WILL DETERMINE THE TYPE, NUMBER REQUIRED AND LOCATION.
7. PLACE 12" X 3/4" DRAIN ROCK UNDER VAULT BOX.
8. PLACE PAD WINDOW FLUSH WITH FRONT INSIDE BOX WALL FOR TYPE "A" PAD.
9. PLACE PAD WINDOW FLUSH WITH REAR INSIDE BOX WALL FOR TYPE "B" PAD.
10. THE BOX SPECIFIED SHALL BE ONE OF THE FOLLOWING: 644-LA-CPA, 660-LA-CPA OR 577-LA-CPA.

ENGINEERING STANDARDS

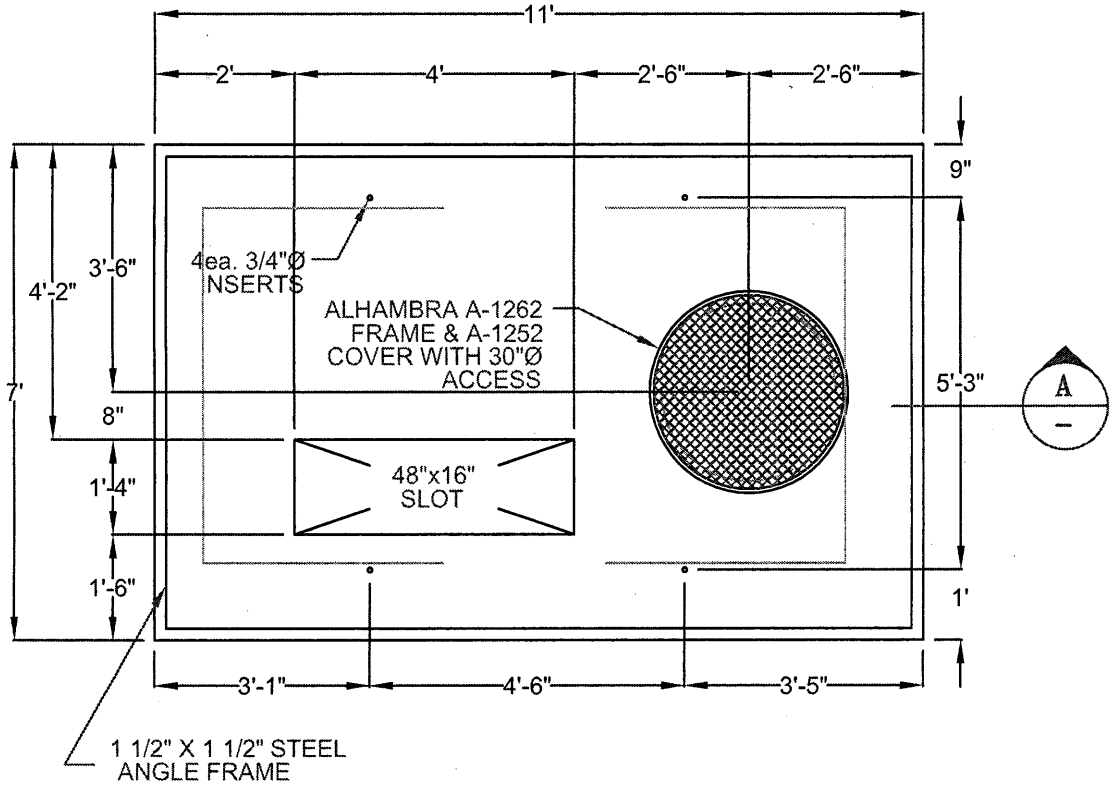
APPROVED 10/02	
PATRICK VALATH	
SR. ENGINEER / MANAGER	
ENGR.	PV
DRWN	DANIEL T.
CHKD.	TT

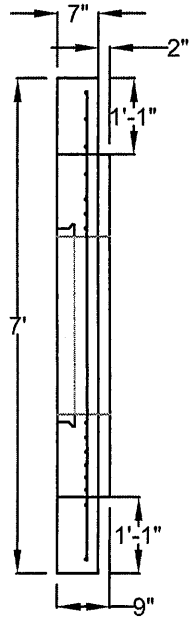
PADMOUNT SWITCHGEAR CONTRETE PAD DETAIL TYPE E & F

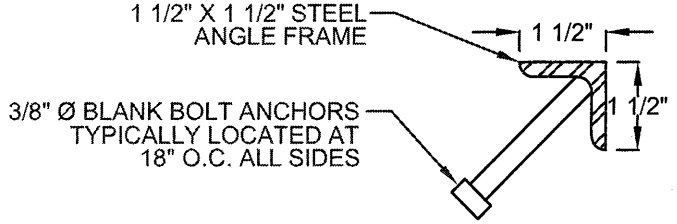
City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION

MAP #	CKT #	SCALE	W.O.# / DRAWING #
-	-	NTS	DT-SS-U-1026
			SHEET 1 OF 5

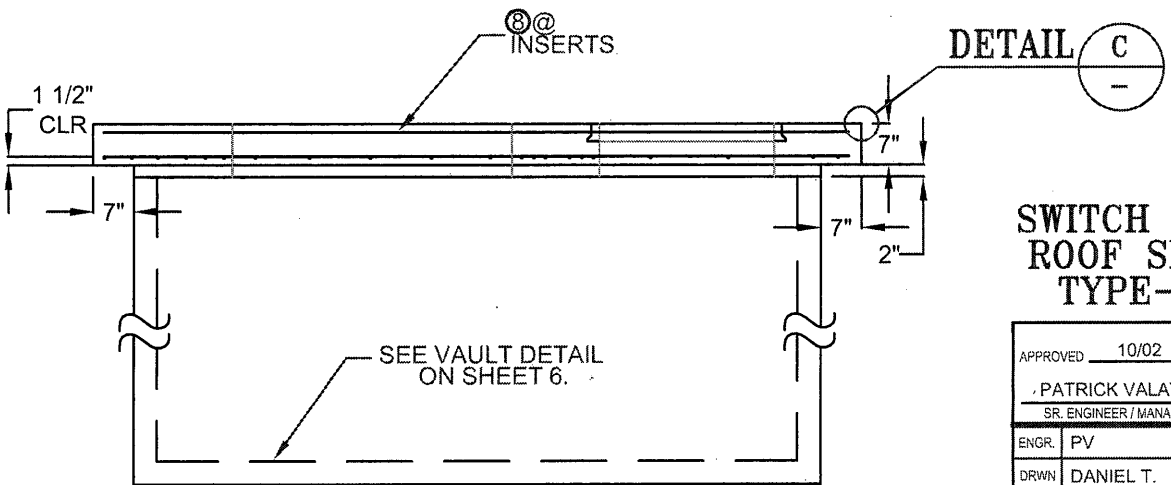






A **ANGLE FRAME DETAIL**

GENERAL NOTES:
1. CONCRETE: fc = 4,500 psi ULTIMATE COMPRESSIVE STRENGTH IN 28 DAYS.
2. REINFORCEMENT: A. REBAR: ASTM A706, GRADE 60
   B. STRENGTH Fy= 60,000 psi.
3. ALL CONCRETE JOINTS TO BE SEALED USING APPROVED JOINT SEALANT UNLESS OTHERWISE NOTED.
4. ALL MATERIAL SHALL BE DOMESTIC. (MADE IN U.S.A.)
5. STRUCTURE DESIGNED FOR EQUIP./PEDESTRIAN LAODING PER ASTM C-857. (300 lb. PER SQ. FT.)



SWITCH PAD ROOF SLAB TYPE-A

MARK	QTY	SIZE	LENGTH	TYPE	A	B	C	WEIGHT
⑨	5	5	1'-3"	STR				7#
⑧	2	4	10'-9"	STR				14#
⑦	1	5	1'-9"	STR				2#
⑥	3	5	4'-9"	STR				15#
⑤	4	5	7'-7"	STR				32#
④	10	5	10'-9"	STR				112#
③	12	5	2'-0"	STR				25#
②	13	5	3'-11"	STR				53#
①	14	5	6'-9"	STR				99#

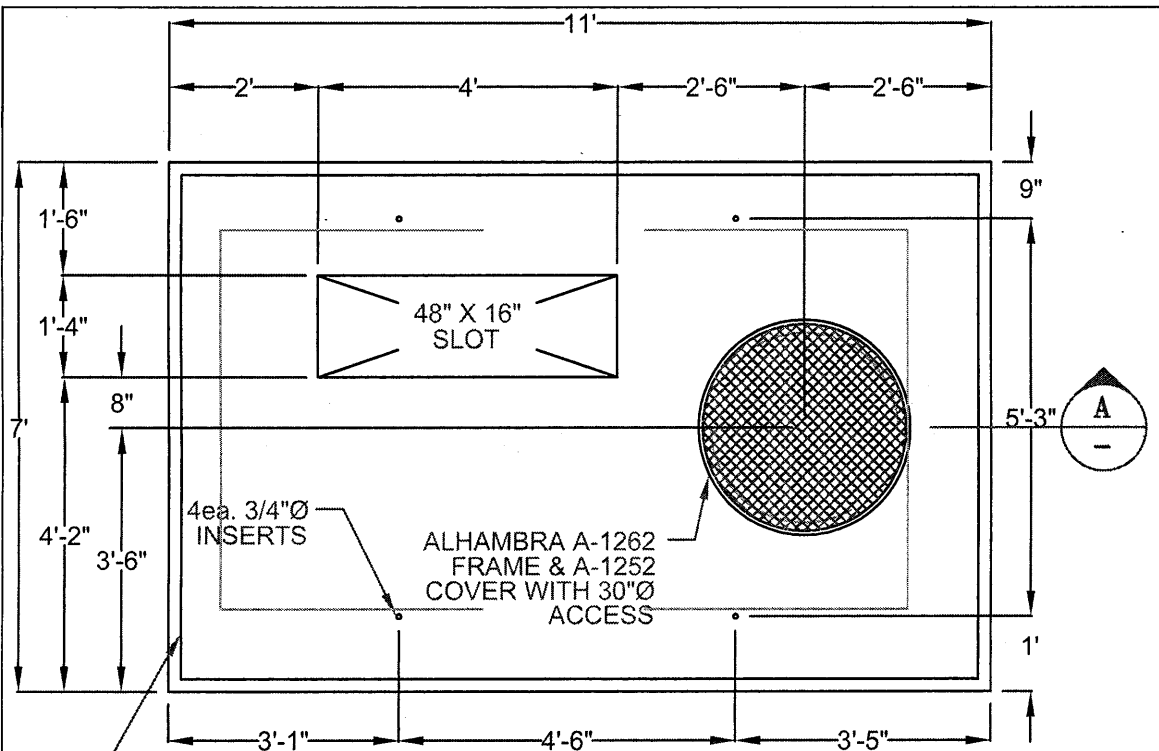
APPROVED	10/02
	PATRICK VALATH
	SR. ENGINEER / MANAGER
ENGR.	PV
DRWN	DANIEL T.
CHKD.	TT

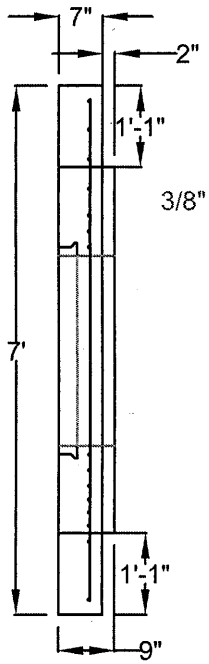
PADMOUNT SWITCHGEAR CONCRETE PAD DETAIL ROOF SLAB TYPE-A

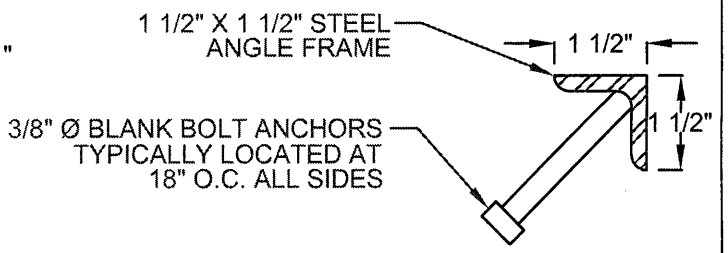
City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION

MAP #	CKT #	SCALE	W.O.# / DRAWING #
-	-	NTS	DT-SS-U-1026
			SHEET 2 OF 5

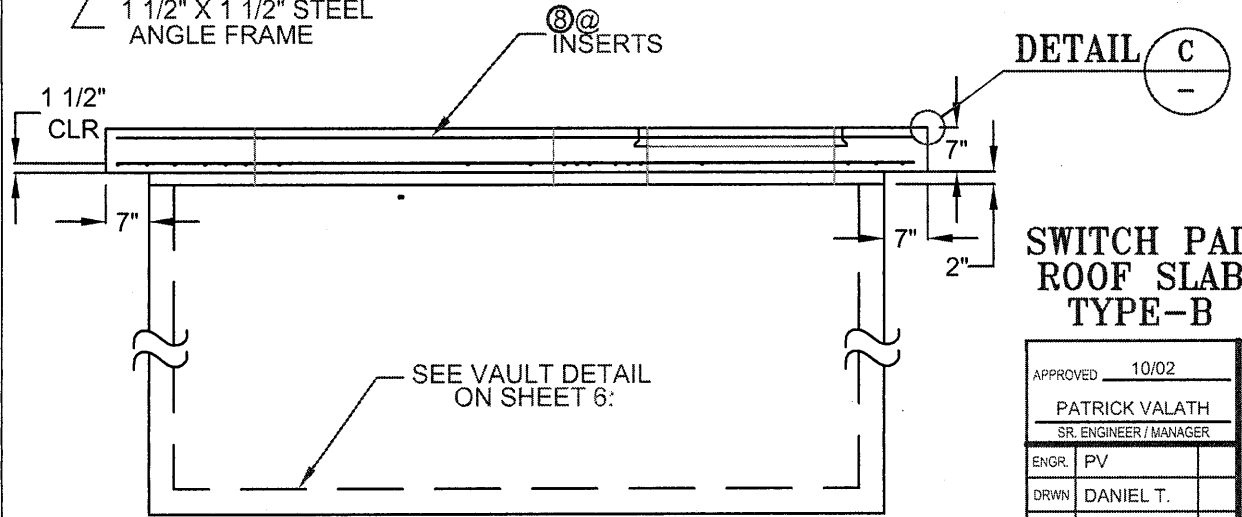






A **ANGLE FRAME DETAIL**

GENERAL NOTES:
1. CONCRETE: fc = 4,500 psi ULTIMATE COMPRESSIVE STRENGTH IN 28 DAYS.
2. REINFORCEMENT: A. REBAR: ASTM A706, GRADE 60
   B. STRENGTH Fy= 60,000 psi.
3. ALL CONCRETE JOINTS TO BE SEALED USING APPROVED JOINT SEALANT UNLESS OTHERWISE NOTED.
4. ALL MATERIAL SHALL BE DOMESTIC. (MADE IN U.S.A.)
5. STRUCTURE DESIGNED FOR EQUIP./PEDESTRIAN LAODING PER ASTM C-857. (300 lb. PER SQ. FT.)



SWITCH PAD ROOF SLAB TYPE-B

MARK	QTY	SIZE	LENGTH	TYPE	A	B	C	WEIGHT
⑨	5	5	1'-3"	STR				7#
⑧	2	4	10'-9"	STR				14#
⑦	1	5	1'-9"	STR				2#
⑥	3	5	4'-9"	STR				15#
⑤	4	5	7'-7"	STR				32#
④	10	5	10'-9"	STR				112#
③	12	5	2'-0"	STR				25#
②	13	5	3'-11"	STR				53#
①	14	5	6'-9"	STR				99#

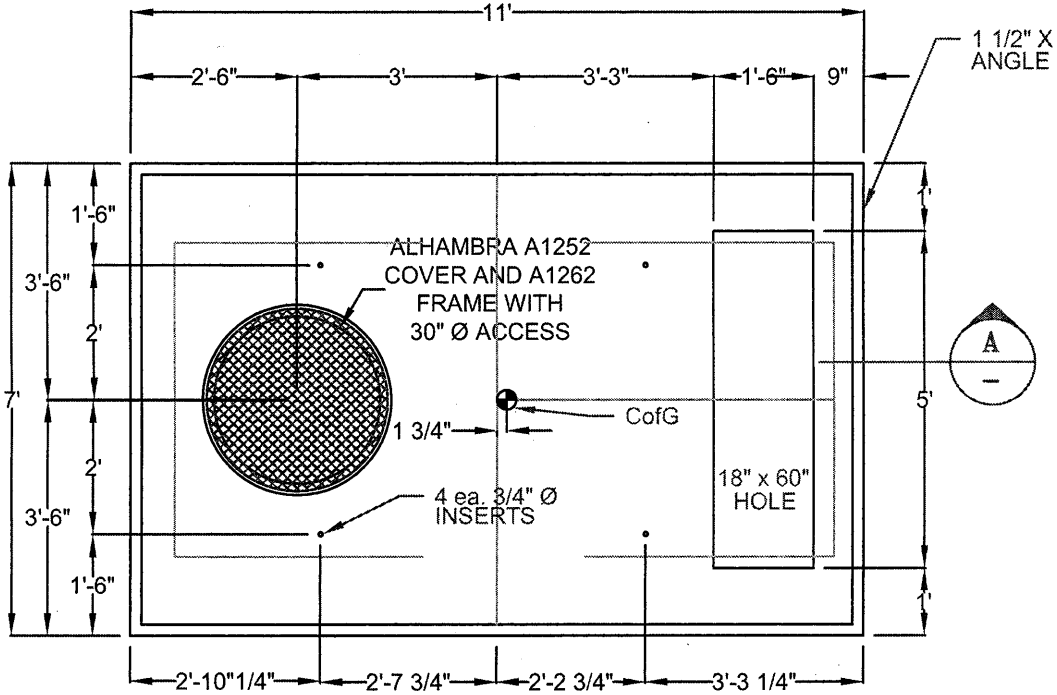
APPROVED 10/02	
PATRICK VALATH	
SR. ENGINEER / MANAGER	
ENGR.	PV
DRWN	DANIEL T.
CHKD.	TT

PADMOUNT SWITCHGEAR
CONCRETE PAD DETAIL
ROOF SLAB TYPE-B

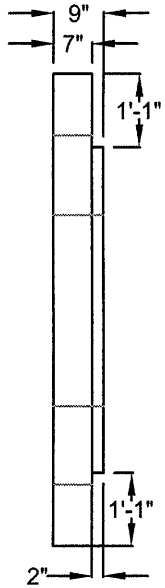
City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION

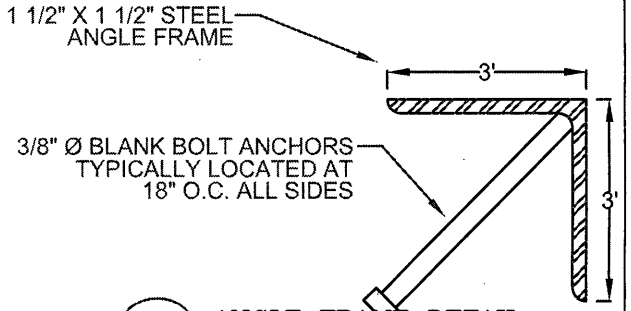
MAP #	CKT #	SCALE	W.O.# / DRAWING #
-	-	NTS	DT-SS-U-1026
			SHEET 3 OF 5

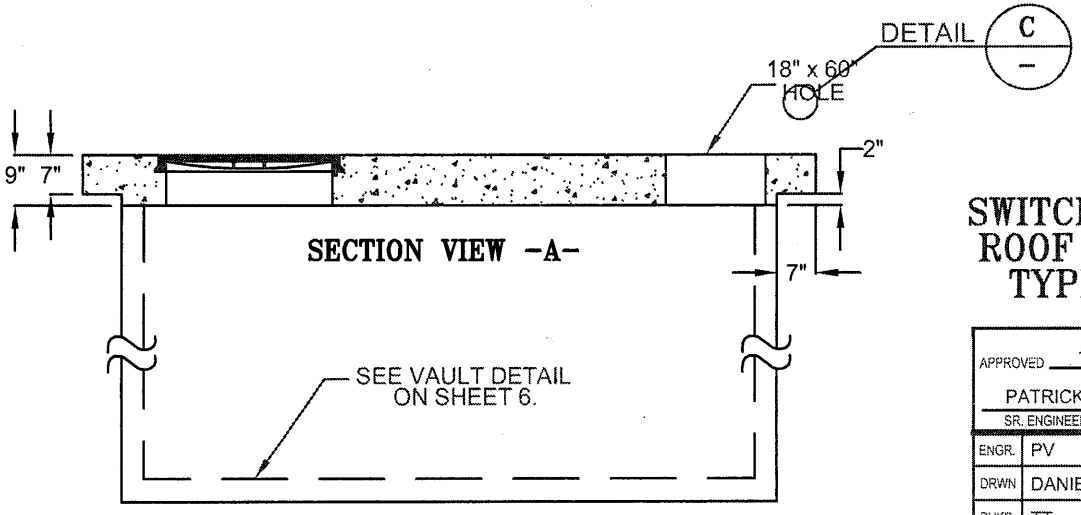


PLAN VIEW



END VIEW





SWITCH PAD ROOF SLAB TYPE-D

STEEL GENERAL NOTES:
1. STEEL: ASTM A36, GALVINIZE AFTER FABRICATION.
2. GALVINIZATION: ASTM A132.
3. WELDING: AWS D1.1.

GENERAL NOTES:
1. CONCRETE: fc = 4,500 psi ULTIMATE COMPRESSIVE STRENGTH IN 28 DAYS.
2. REINFORCEMENT: A. REBAR: ASTM A706, GRADE 60
   B. STRENGTH Fy= 60,000 psi.
3. ALL CONCRETE JOINTS TO BE SEALED USING APPROVED JOINT SEALANT UNLESS OTHERWISE NOTED.
4. ALL MATERIAL SHALL BE DOMESTIC. (MADE IN U.S.A.)
5. STRUCTURE DESIGNED FOR EQUIP./PEDESTRIAN LAODING PER ASTM C-857. (300 lb. PER SQ. FT.)

APPROVED	10/02
	PATRICK VALATH
	SR. ENGINEER / MANAGER
ENGR.	PV
DRWN	DANIEL T.
CHKD.	TT

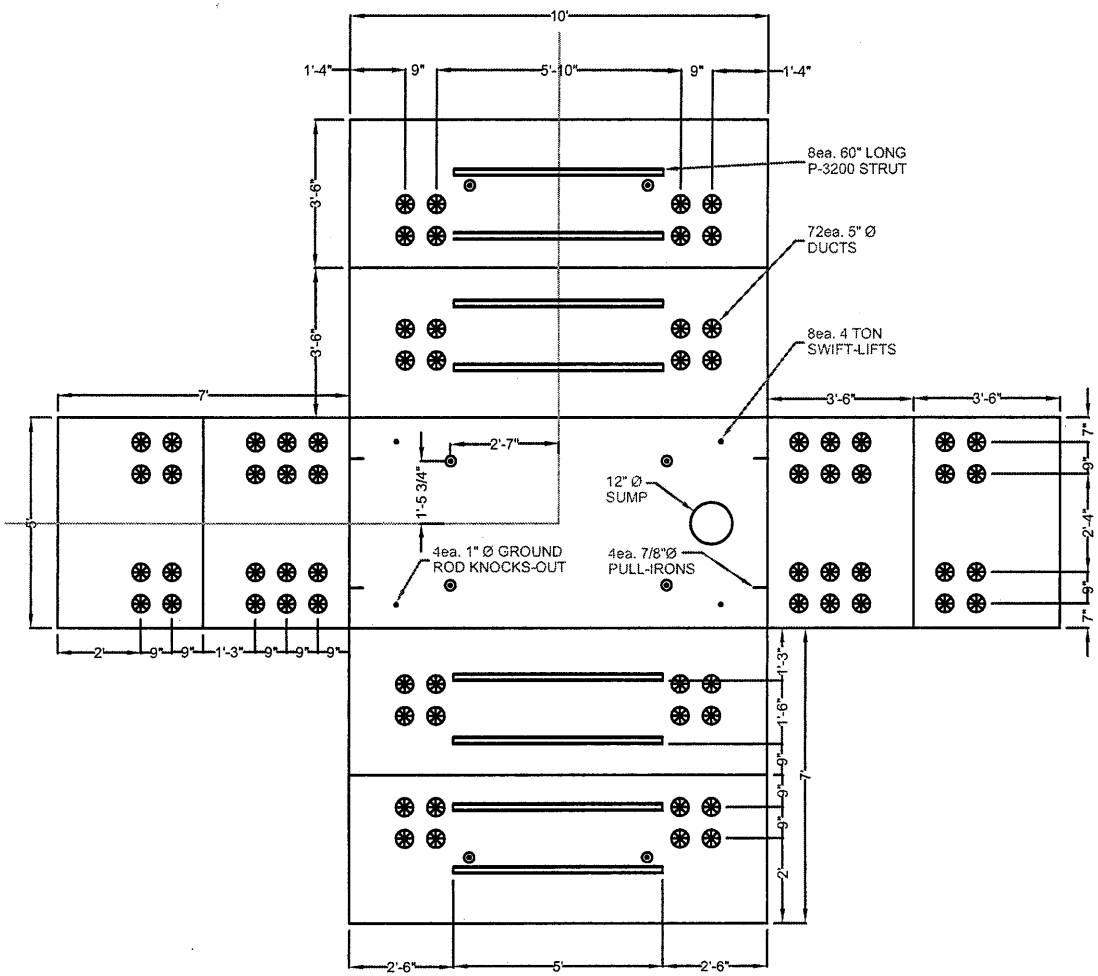
PADMOUNT SWITCHGEAR CONCRETE PAD DETAIL ROOF SLAB TYPE-D

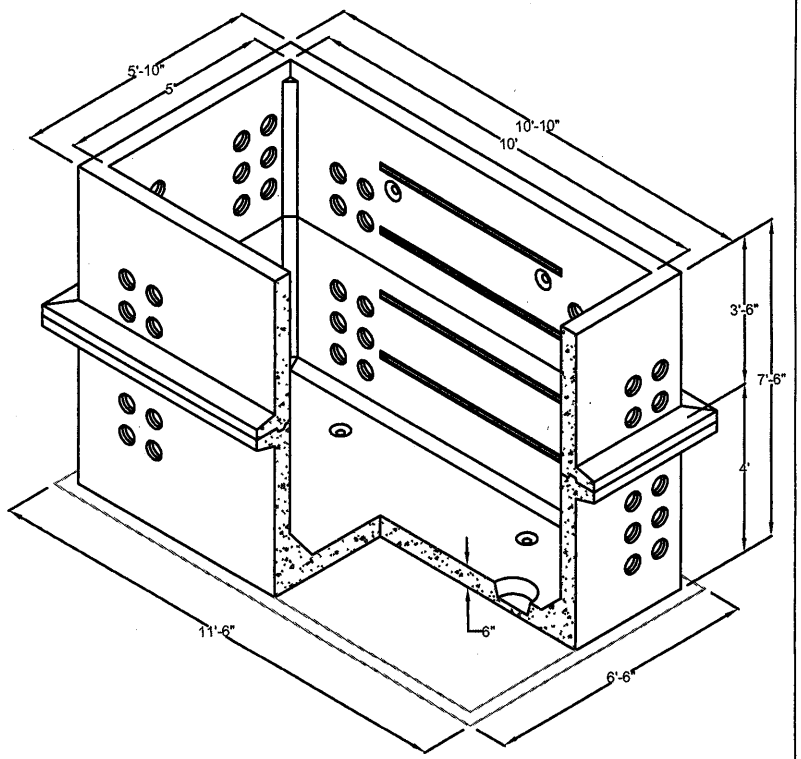
City of Palo Alto
California
UTILITIES. ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION

MAP #	CKT #	SCALE	W.O.# / DRAWING #
-	-	NTS	DT-SS-U-1026

SHEET 4 OF 5





TOP WEIGHT: 9,800#
BASE WEIGHT: 11,400#

GENERAL NOTES:
1. CONCRETE: fc = 4,500 psi ULTIMATE COMPRESSIVE STRENGTH IN 28 DAYS.
2. REINFORCEMENT: A. REBAR: ASTM A706, GRADE 60
   B. STRENGTH Fy= 60,000 psi.
3. ALL CONCRETE JOINTS TO BE SEALED USING APPROVED JOINT SEALANT UNLESS OTHERWISE NOTED.
4. ALL MATERIAL SHALL BE DOMESTIC. (MADE IN U.S.A.)
5. STRUCTURE DESIGNED FOR EQUIP./PEDESTRIAN LAODING PER ASTM C-857. (300 lb. PER SQ. FT.)

ENGINEERING STANDARDS

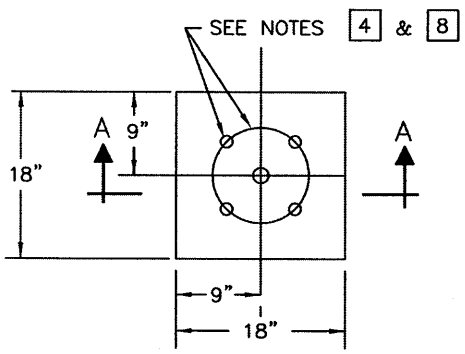
APPROVED	10/02
	PATRICK VALATH
	SR. ENGINEER / MANAGER
ENGR.	PV
DRWN	DANIEL T.
CHKD.	TT

5' X 10' VAULT FOR SWITCHGEAR PADS TYPE A, B, C & D.

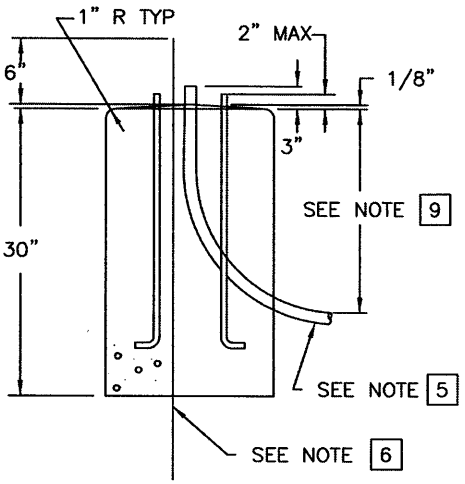
City of Palo Alto
California
UTILITIES. ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION

MAP #	CKT #	SCALE	W.O.# / DRAWING #
-	-	NTS	DT-SS-U-1026
			SHEET 5 OF 5



10'–14' MOUNTING HEIGHT



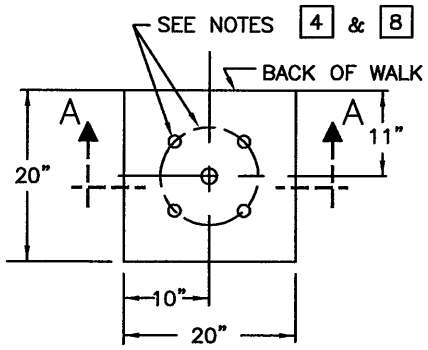
SECTION A–A

NOTES:

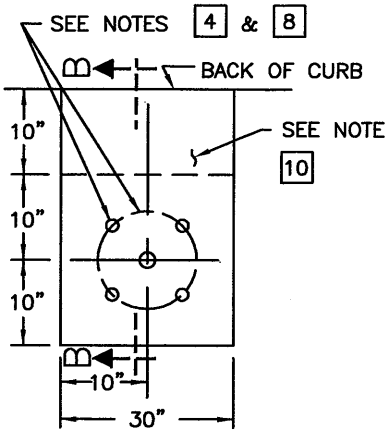
1. WHEN FOUNDATION IS IN SIDEWALK, THE TOP SHALL BE FLUSH WITH SIDEWALK. WHEN OTHER THAN SIDEWALK THE TOP SHALL BE 2" ABOVE GROUND LEVEL.
2. CONCRETE IN FOUNDATION SHALL BE CLASS "B"
3. TOP 6" OF FOUNDATION MUST BE POURED AFTER POLE IS MOUNTED AND PLUMBED.
4. BOLT CIRCLE DIA. TO BE USED IS TO MATCH SUPPLIED POLE.
5. UNLESS OTHERWISE NOTED, ALL CONDUITS SHALL BE P.V.C. 2" MINIMUM.
6. ALL FOUNDATIONS REQUIRE 5/8" X 8' GROUND ROD. FOR GROUNDING SYSTEM SEE ELECTRIC UTILITY STANDARD DWG. DT–SS–U–1001 SHEET 2.
7. ALL FOUNDATIONS SHALL BE POURED AGAINST UNDISTURBED SOIL.
8. 3/4" DIA. X 17" X 3" GALVANIZED STEEL ANCHOR BOLTS WITH TWO HEX NUTS, TWO FLAT WASHERS AND TWO LOCKWASHERS – FOUR EACH REQUIRED PER POLE.
9. AS REQUIRED TO MATCH EXISTING OR NEW STREET LIGHT CONDUIT BEING INSTALLED.

APPROVED ____ 199	**ENGINEERING STANDARD**				
ENGR. MANAGER	10'–14' STREET LIGHT FOUNDATION				
		REV	DATE	DESCRIPTION	APPR
ENGR. PEV	**CITY OF PALO ALTO**	NTS		SL–SS–C–1021	
DRAWN LES	**CALIFORNIA**				
CHECKED PEV		SCALE		STANDARD NO.	SHEET NO.

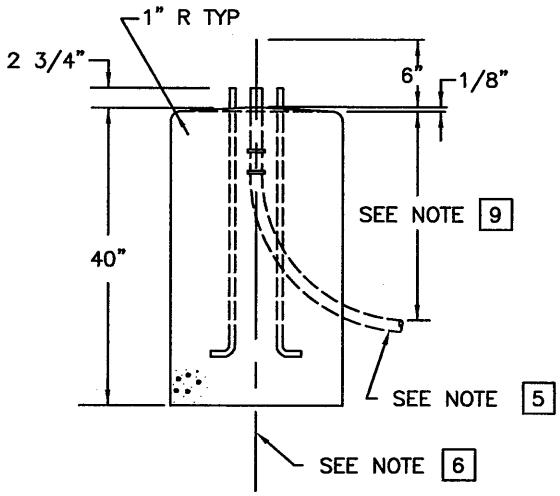
Original Signed and Approved by Engineering Manager



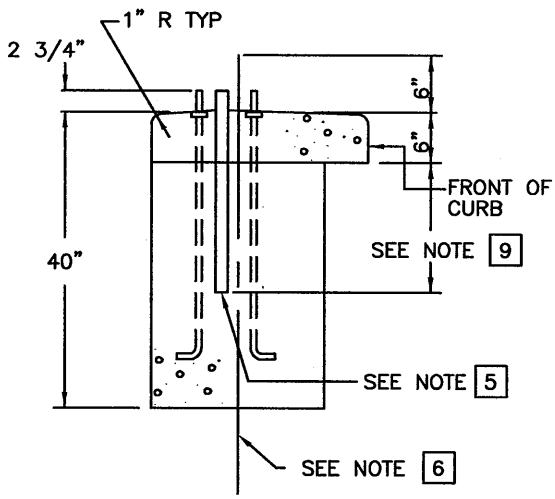
20'–25' MOUNTING HEIGHT
ADJACENT TO SIDEWALK



20'–25' MOUNTING HEIGHT
ADJACENT TO CURB



SECTION A–A

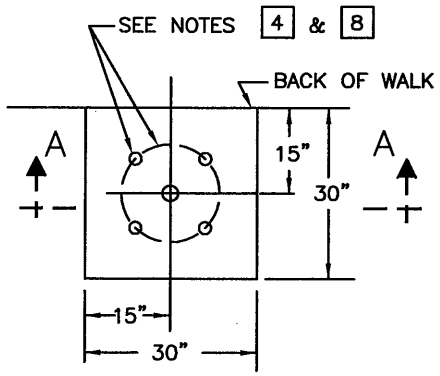


SECTION B–B

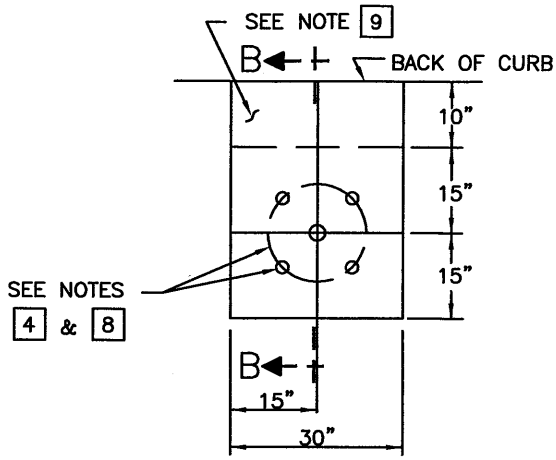
NOTES:

1. WHEN FOUNDATION IS IN SIDEWALK, THE TOP SHALL BE FLUSH WITH SIDEWALK. WHEN OTHER THAN SIDEWALK THE TOP SHALL BE 2" ABOVE GROUND LEVEL.
2. CONCRETE IN FOUNDATION SHALL BE CLASS "B"
3. TOP 6" OF FOUNDATION MUST BE POURED AFTER POLE IS MOUNTED AND PLUMBED.
4. BOLT CIRCLE DIA. TO BE USED IS AS FOLLOWS:
   a. 20' POLE – 9" TO 10" DIA.
   b. 25' POLE – 10" TO 11" DIA.
5. UNLESS OTHERWISE NOTED, ALL CONDUITS SHALL BE P.V.C. 2" MINIMUM.
6. ALL FOUNDATIONS REQUIRE 5/8" X 8' GROUND ROD. FOR GROUNDING SYSTEM SEE ELECTRIC UTILITY STANDARD DWG. DT–SS–U–1001 SHEET 2.
7. ALL FOUNDATIONS SHALL BE POURED AGAINST UNDISTURBED SOIL.
8. 1" DIA. X 3' X 4" GALVANIZED STEEL ANCHOR BOLTS WITH TWO HEX NUTS, TWO FLAT WASHERS AND TWO LOCKWASHERS – FOUR EACH REQUIRED PER POLE.
9. AS REQUIRED TO MATCH EXISTING OR NEW STREET LIGHT CONDUIT BEING INSTALLED. BEING INSTALLED.
10. THIS AREA REQUIRED ONLY 6" THICKNESS OF CONCRETE.

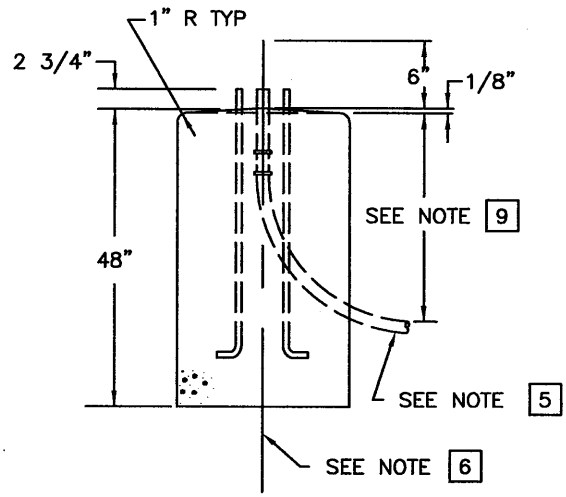
APPROVED 3/1994	ENGINEERING STANDARD				
ENGR. MANAGER	20'–25' STREET LIGHT FOUNDATION				
		REV	DATE	DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO	NTS	SL–SS–C–1022		
DRAWN UES	CALIFORNIA	SCALE	STANDARD NO.		SHEET NO.
CHECKED PEV					



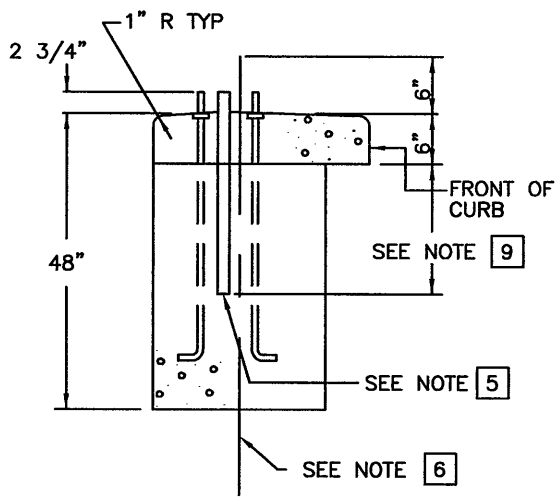
30' MOUNTING HEIGHT ADJACENT TO SIDEWALK



30' MOUNTING HEIGHT ADJACENT TO CURB



SECTION A-A



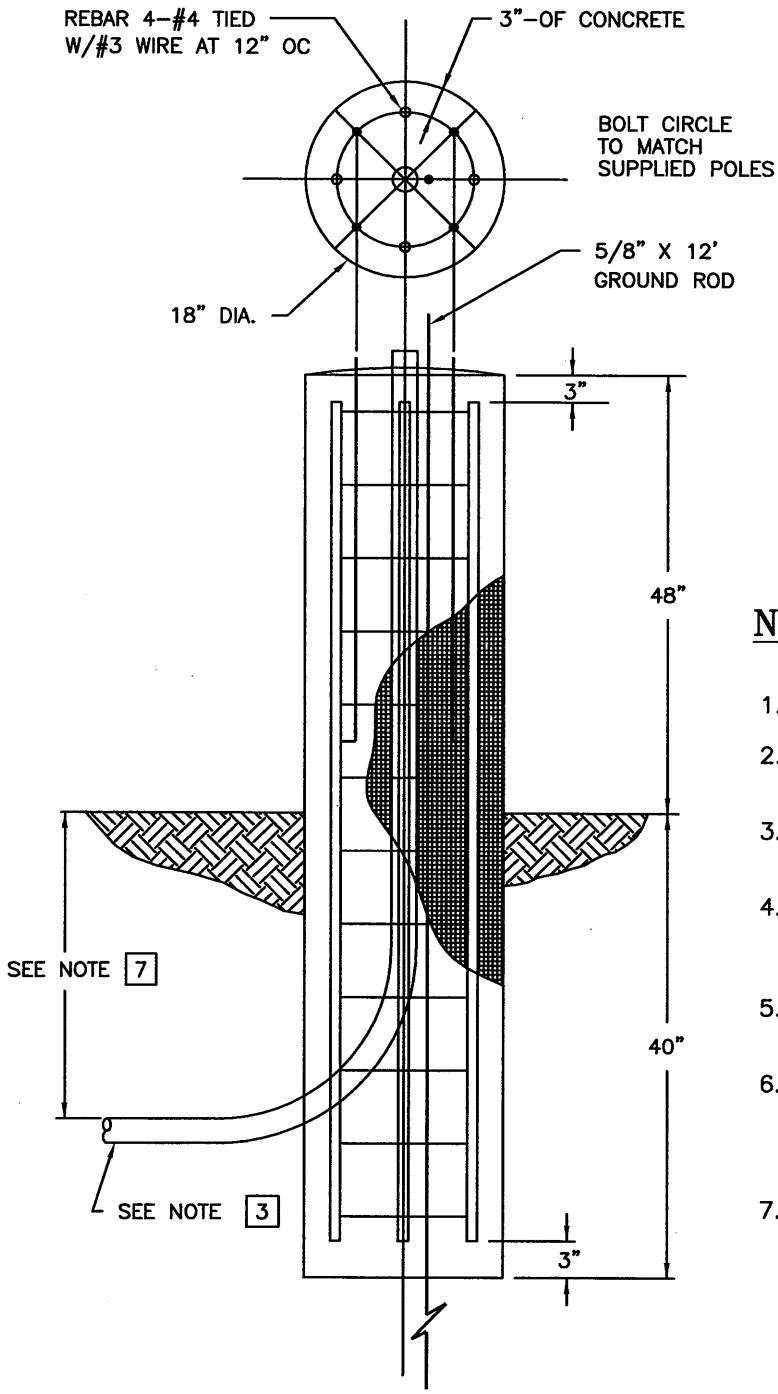
SECTION B-B

NOTES:

1. WHEN FOUNDATION IS IN SIDEWALK, THE TOP SHALL BE FLUSH WITH SIDEWALK. WHEN OTHER THAN SIDEWALK THE TOP SHALL BE 2" ABOVE GROUND LEVEL.
2. CONCRETE IN FOUNDATION SHALL BE CLASS "B"
3. TOP 6" OF FOUNDATION MUST BE POURED AFTER POLE IS MOUNTED AND PLUMBED.
4. BOLT CIRCLE DIA. TO BE USED IS 11" TO 12".
5. UNLESS OTHERWISE NOTED, ALL CONDUITS SHALL BE P.V.C. 2" MINIMUM.
6. ALL FOUNDATIONS REQUIRE 5/8" X 8' GROUND ROD. FOR GROUNDING SYSTEM SEE ELECTRIC UTILITY STANDARD DWG. DT-SS-U-1001 SHEET 2.
7. ALL FOUNDATIONS SHALL BE POURED AGAINST UNDISTURBED SOIL.
8. 1" DIA. X 3' X 4" GALVANIZED STEEL ANCHOR BOLTS WITH TWO HEX NUTS, TWO FLAT WASHERS AND TWO LOCKWASHERS - FOUR EACH REQUIRED PER POLE.
9. AS REQUIRED TO MATCH EXISTING OR NEW STREET LIGHT CONDUIT BEING INSTALLED. BEING INSTALLED.
10. THIS AREA REQUIRED ONLY 6" THICKNESS OF CONCRETE.

APPROVED 3/1994 mDBland ENGR. MANAGER	ENGINEERING STANDARD 30' STREET LIGHT FOUNDATION				
				REV	DATE	DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS	SL-SS-C-1023	
DRAWN UES MJ		SCALE	STANDARD NO.	SHEET NO.
CHECKED PEV				

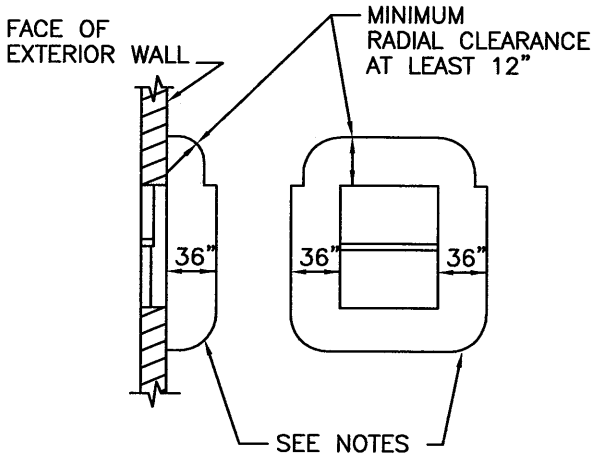
STREET LIGHT FOUNDATION FOR TRAFFIC EXPOSED AREAS

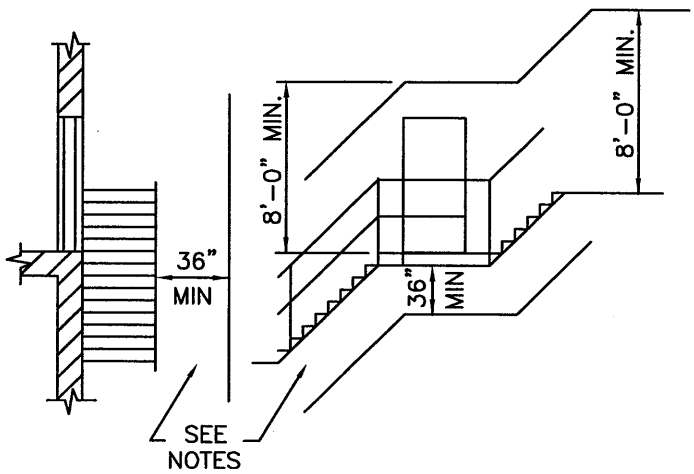


NOTES:

1. CONCRETE IN FOUNDATION SHALL BE CLASS "B"
2. BOLT CIRCLE DIA. TO BE USED IS TO MATCH SUPPLIED POLES.
3. UNLESS OTHERWISE NOTED, ALL CONDUITS SHALL BE P.V.C. 2" MINIMUM.
4. ALL FOUNDATIONS REQUIRE 5/8" X 12' GROUND ROD. FOR GROUNDING SYSTEM SEE ELECTRIC UTILITY STANDARD DWG. DT-SS-U-1001 SHEET 2.
5. ALL FOUNDATIONS SHALL BE POURED AGAINST UNDISTURBED SOIL.
6. 1" DIA. X 3' X 4" GALVANIZED STEEL ANCHOR BOLTS WITH TWO HEX NUTS, TWO FLAT WASHERS AND TWO LOCKWASHERS – FOUR EACH REQUIRED PER POLE.
7. AS REQUIRED TO MATCH EXISTING OR NEW STREET LIGHT CONDUIT BEING INSTALLED.

APPROVED 3/1994	ENGINEERING STANDARD				
ENGR. MANAGER	STREET LIGHT PEDESTAL FOUNDATION				
		1	11/08	CHANGED DWG NUMBER FROM DT-SS-U-1024 TO CURRENT	TT
		REV	DATE	DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS		SL-SS-C-1024	
DRAWN UES/MJ MJ		SCALE		STANDARD NO.	SHEET NO.
CHECKED PEV					





SIDE VIEW **FRONT VIEW**

CLEARANCE REQUIRED
AROUND WINDOWS

SIDE VIEW **FRONT VIEW**

CLEARANCE REQUIRED
AROUND DOORS

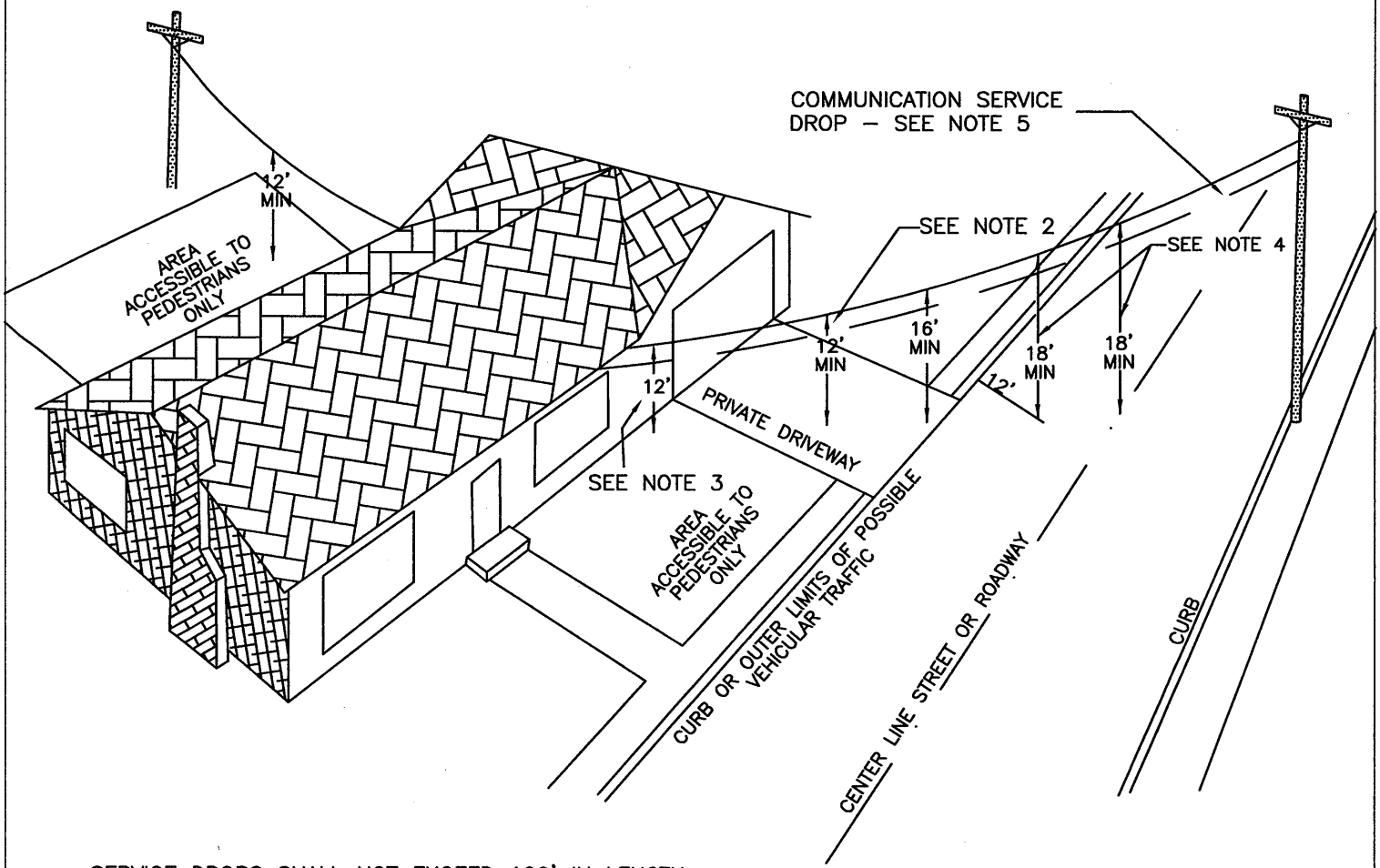
LEGEND:

——— BOUNDARY OF CLEARANCE AREA THROUGH WHICH CONDUCTORS MUST NOT PASS.

NOTES:

1. SERVICE WIRES SHOULD NOT BE ATTACHED TO THE BUILDING WALL WITHIN THE ABOVE CLEARANCE AREA AND SHOULD NOT PASS THROUGH CLEARANCE SPACE ILLUSTRATED IN SKETCHES.
2. GENERAL ORDER 95, ISSUED BY THE CALIFORNIA PUBLIC UTILITIES COMMISSION REQUIRES THAT:
   A. ALL PORTIONS OF THE SERVICE DROP SHALL HAVE A MINIMUM HORIZONTAL CLEARANCE OF 3 FEET FROM ANY EXIT, WINDOW, OR OTHER POINT AT WHICH HUMAN CONTAC MIGHT BE EXPECTED.
   B. THE SERVICE DROP SHALL BE LOCATED TO MINIMIZE INTERFERENCE WITH OR ENDANGERING WORKMEN AND FIREMEN IN THE PERFORMANCE OF THEIR DUTIES. THIS MEANS THAT SERVICE DROPS SHLL BE LOCATED SO THAT A FIREMAN CAN PLACE A LADDER AGAINST ANY WINDOW WITHOUT INTERFERENCE OR DANGER.

APPROVED 3/1994 mDBland ENGR. MANAGER	ENGINEERING STANDARD **SERVICE DROP CLEARANCE REQUIREMENTS FOR WINDOWS, DOORS, FIRE ESCAPES, STAIRWAYS, BALCONIES, ETC.**	2	8-08	REVISED NOTES	TT
		1	9-99	CHANGED NOTES	FINCH
		REV	DATE	DESCRIPTION	APPR
ENGR PEV DRAWN UES/MJ MJ CHECKED PEV	**CITY OF PALO ALTO** **CALIFORNIA**	NTS		SR-CL-0-1011	
		SCALE		STANDARD NO.	SHEET NO.



SERVICE DROPS SHALL NOT EXCEED 100' IN LENGTH.

NOTES:

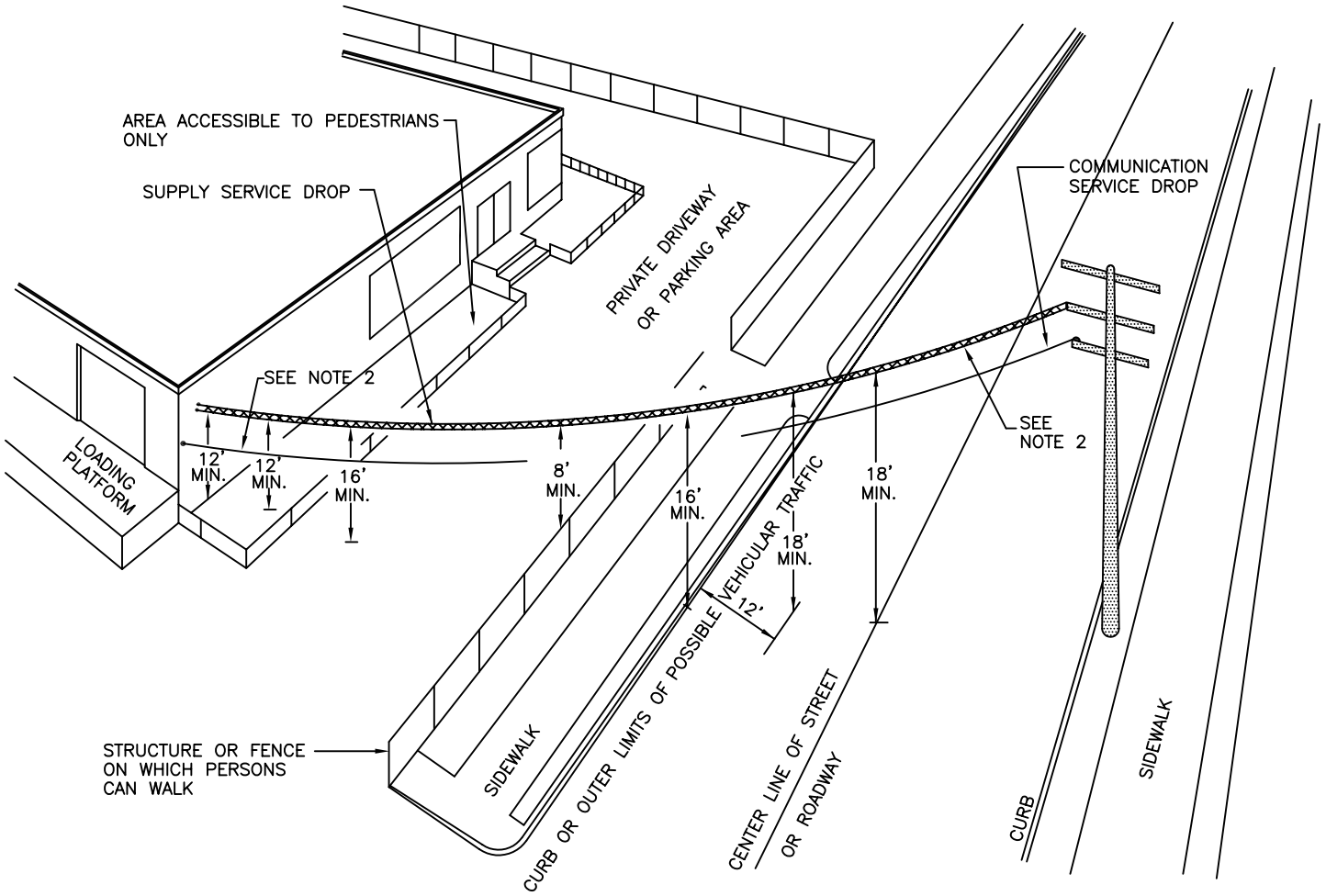
VERTICAL CLEARANCES ABOVE GROUND:

1.	CROSSING ABOVE RR TRACKS WITHOUT OVERHEAD TROLLEY WIRE	25 FEET MINIMUM
2.	CROSSING ABOVE PRIVATE DRIVEWAYS OR OTHER AREAS ACCESSIBLE TO VEHICLES	12 FEET MINIMUM
3.	CROSSING ABOVE AREAS ACCESSIBLE TO PEDESTRIANS ONLY	12 FEET MINIMUM
4.	CROSSING ABOVE PUBLIC STREET MORE THAN 12' FROM CURB LINE	18 FEET MINIMUM

5. COMMUNICATION SERVICE DROP MUST HAVE A 24" MIN. RADIAL CLEARANCE FROM ELECTRIC SERVICE DROP IF IT IS FARTHER THAN 15' FROM BUILDING POINT OF ATTACHMENT. IF LESS THAN 15', MINIMUM CLEARANCE IS 12".

REFERENCE: GENERAL ORDER 95, RULE 54.8–B.

APPROVED 3/1994			ENGINEERING STANDARD				
ENGR. MANAGER			MINIMUM GROUND CLEARANCES FOR SUPPLY SERVICE DROPS, 0–300 VOLTS RESIDENTIAL PREMISES	2	8/08	REVISED	TT
				1	6/99	REVISED	FINCH
				REV	DATE	DESCRIPTION	APPR
ENGR	PEV		CITY OF PALO ALTO CALIFORNIA	NTS		SR–CL–O–1015	1 OF 1
DRAWN	MJ			SCALE		STANDARD NO.	SHEET NO.
CHECKED	PEV						

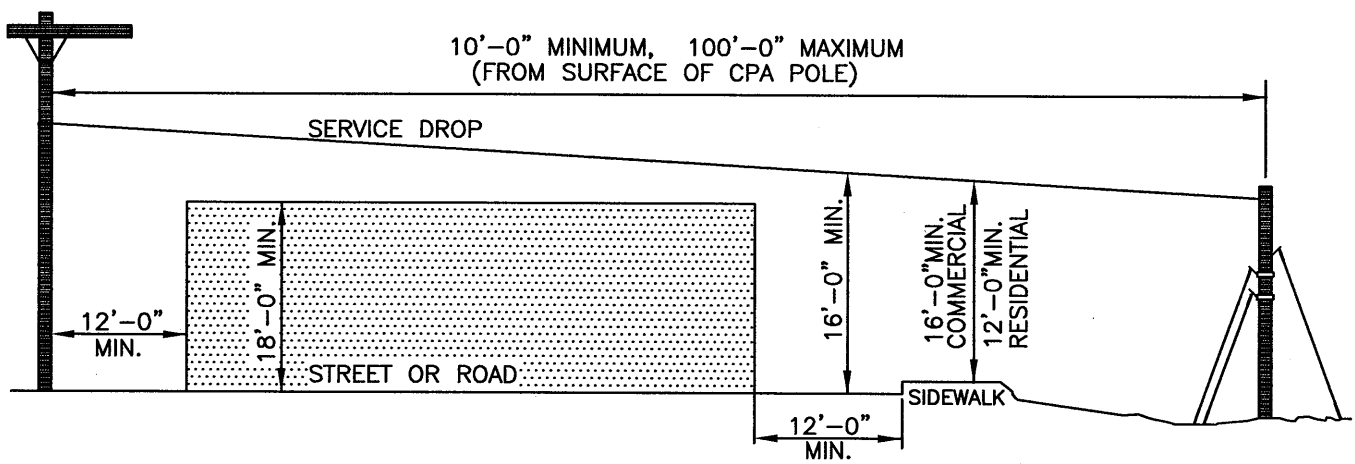


NOTES:

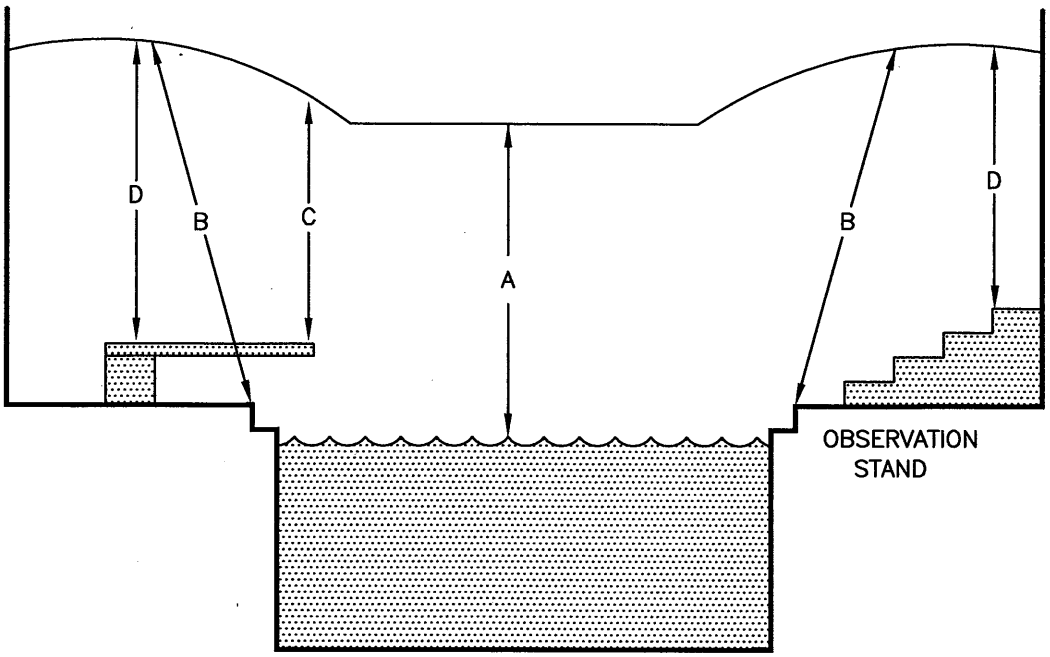
1. VERTICAL GROUND CLEARANCE WHEN CROSSING ABOVE RR TRACKS WITHOUT OVERHEAD TROLLEY WIRE 25 FEET MINIMUM.
2. 24" MIN. RADIAL CLEARANCE FROM SUPPLY SERVICE DROP TO COMMUNICATION SERVICE DROP IF MORE THAN 15" FROM POINT OF BUILDING ATTACHMENT OF EITHER SERVICE. IF LESS THAN 15 FT., 12" MIN. RADIAL CLEARANCE.
3. CPA UTILITIES ENGINEERING MUST BE CONSULTED ON ALL COMMERCIAL JOBS. THIS SHALL BE DONE IN THE PLANNING STAGE OF THE JOB.
4. ELECTRIC METER MUST BE LOCATED OUTSIDE THE BUILDING OR IN A TANDEM–LOCKED METER ROOM READILY ACCESSIBLE TO THE METER READER DURING NORMAL WORKING HOURS.
5. REFER TO GENERAL ORDER 95 RULE 54.8B–(4) FOR SERVICE DROP CLEARANCES OVER BUILDINGS.
6. SERVICE DROP LENGTH SHALL NOT EXCEED 100 FT.

REFERENCE: GENERAL ORDER 95, RULE 54.8–B.

APPROVED 3/1994	ENGINEERING STANDARD				
ENGR. MANAGER	GROUND CLEARANCES FOR SUPPLY SERVICE DROPS, 0–750 VOLTS INDUSTRIAL & COMMERCIAL PREMISES				
		1	6/99	REVISED	FINCH
		REV	DATE	DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS		SR–CL–0–1016	1 OF 1
DRAWN MJ		SCALE		STANDARD NO.	SHEET NO.
CHECKED PEV					



APPROVED 3/1994	ENGINEERING STANDARD					
ENGR. MANAGER	CLEARANCE FOR SERVICE POLE FOR SUPPLY SERVICE DROP 0–300 VOLTS					
		REV	DATE	DESCRIPTION		APPR
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS		SR–CL–0–1017		1 OF 1
DRAWN MJ		SCALE		STANDARD NO.		SHEET NO.
CHECKED PEV						



* POOL

NOTES

1. REQUIRED CLEARANCES APPLY TO PUBLIC, COMMERCIALLY OPERATED, AND RESIDENTIAL POOLS.

		DIMENSION
A.	VERTICAL CLEARANCE FROM HIGHEST WATER LEVEL:	22.5 FEET
B.	RADIAL CLEARANCE FROM TOP EDGE OF POOL WALL	22.5 FEET
C.	VERTICAL CLEARANCE FROM DIVING BOARD OR PLATFORM THAT IS OVER THE WATER SURFACE OF THE POOL:	14.5 FEET
D.	VERTICAL CLEARANCE ABOVE DIVING BOARD OR PLATFORM THAT IS NOT OVER THE WATER SURFACE OF THE POOL:	14.5 FEET

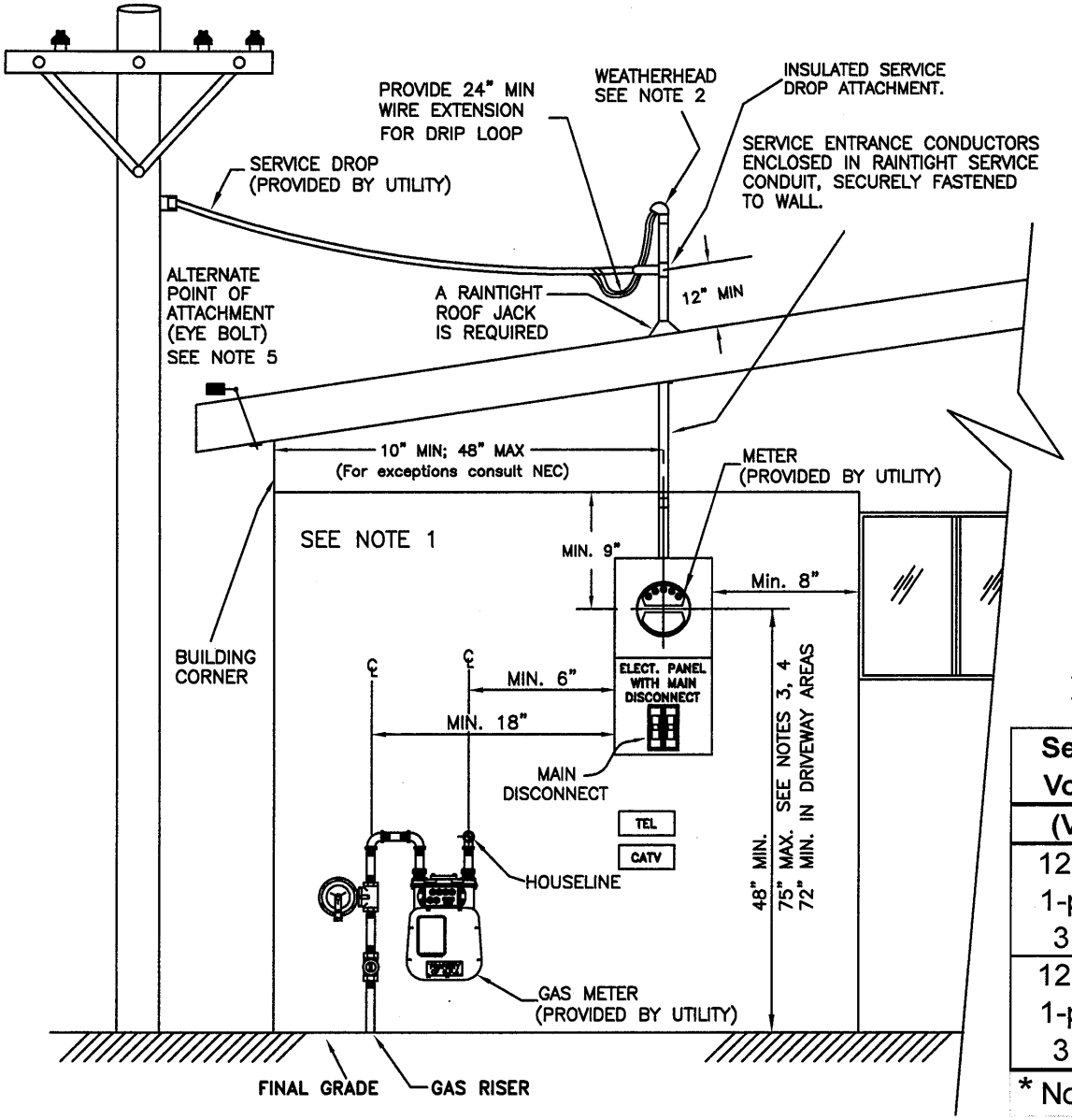
2. HORIZONTAL LIMIT OF CLEARANCES ARE TO THE OUTER EDGE OF ANY ITEMS IDENTIFIED IN ITEMS A TO D, BUT NO LESS THAN 10 FEET OUT FROM THE INSIDE WALL OF POOL.

3. INSTALLATION OF SERVICE DROPS ABOVE SWIMMING POOLS, HOT TUBS, AND SPAS SHALL BE AVOIDED.

4. IF IN THE OPINION OF CITY OF PALO ALTO UTILITIES ENGINEERING AND OPERATIONS PERSONNEL AN OVERHEAD SERVICE INSTALLATION DESIGNED TO MEET THE STIPULATED CLEARANCE REQUIREMENTS CREATES AN UNSAFE WORKING CONDITION FOR UTILITY WORKERS, THE SERVICE WILL BE REQUIRED TO BE UNDERGROUND.

REFERENCE:
CALIFORNIA ELECTRICAL CODE, ARTICLE 680.8

APPROVED 3/1994		ENGINEERING STANDARD				
MDB		CLEARANCES FROM SERVICE DROPS 0-750 VOLTS	2	10/09	REV CLEARANCES/NOTES – CEC 70ING	
ENGR. MANAGER		SWIMMING POOLS, HOT TUBS & SPAS	1	6/99	REVISED	FINCH
			REV	DATE	DESCRIPTION	APPR
ENGR	PEV	CITY OF PALO ALTO	NTS		SR-CL-0-1018	1 OF 1
DRAWN	MJ	CALIFORNIA	SCALE		STANDARD NO.	SHEET NO.
CHECKED	PEV					



BUILDING ELEVATION

NOTES:

1. NO OBSTRUCTIONS PERMITTED WITHIN THE AREA AROUND THE METER.
2. THE WEATHERHEAD MUST BE LOCATED NO MORE THAN 24" FROM THE SERVICE ATTACHMENT POINT. THE SERVICE DROP CONDUCTORS SHALL NOT RUN ACROSS THE ROOF CREATING A TRIPPING HAZARD. PERISCOPE MUST BE BRACED AGAINST THE SERVICE CONDUCTOR PULL IF IT EXTENDS MORE THAN 30" ABOVE THE ROOF
3. METER SOCKET CLEARANCE FROM THE GROUND MUST BE MEASURED FROM THE FINAL GRADE
4. MAINTAIN A 30" WIDE x 36" DEEP CLEAR AND LEVEL WORKING SPACE IN FRONT OF THE ELECTRIC METER
5. WHERE LOAD REQUIRES HEAVY SERVICE DROP CONDUCTORS, THE SERVICE DROP WILL BE 3 SINGLE CONDUCTORS INSTEAD OF CABLE AND 3 EYEBOLTS OR INSULATED CLEVICES WILL BE REQUIRED.
6. METER MOUNTING DEVICE SHALL HAVE A MAIN DISCONNECT IN THE SAME CABINET.
7. FOR MORE DETAILED INFORMATION CONSULT CPA SERVICE REQUIREMENTS MANUAL.
8. UNLESS OTHERWISE NOTED, ALL SERVICE FACILITIES ARE THE RESPONSIBILITY OF THE CUSTOMER.

RECOMMENDED SERVICE ENTRANCE CONDUCTOR

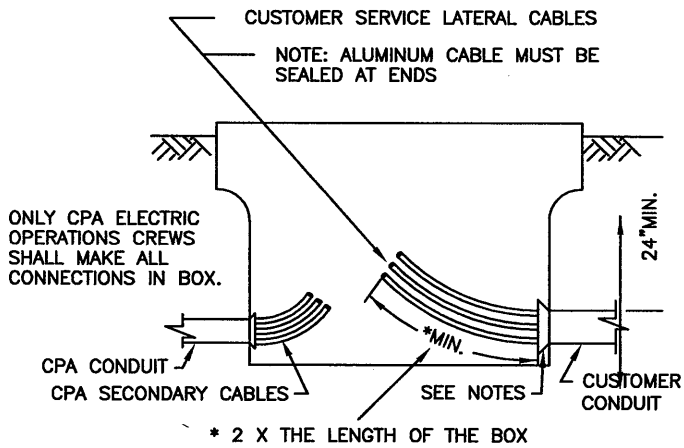
Service Voltage (Volts)	Main Service (Amps)	Customer's Minimum Conduit Size	Recommended Conductor Size AL	Recommended Conductor Size CU
120/240 1-phase 3 wire	125	2"	1/0	2
	200	2"	4/0	2/0
	400*	4"	750	500
120/208 1-phase 3 wire	200	2"	4/0	2/0

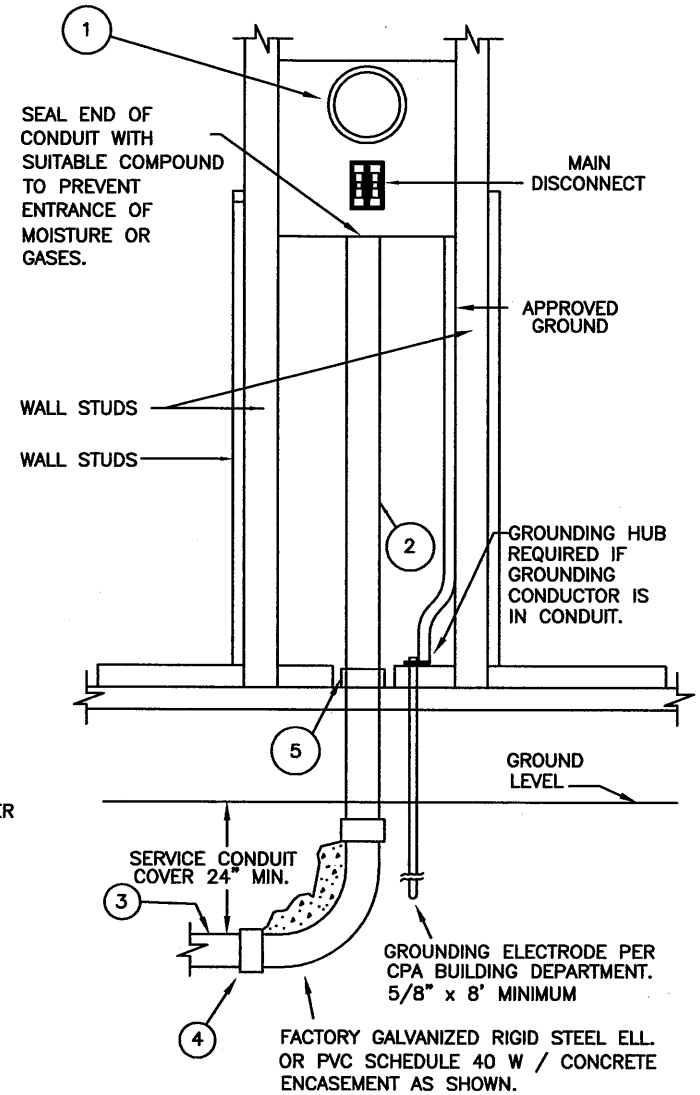
* Note: Class 320 (Residential only)

APPROVED 12/2006	ENGINEERING STANDARD	REV	DATE	DESCRIPTION	APPR
Original Signed and Approved by Engineering Manager	TYPICAL OVERHEAD SERVICE INSTALLATION	3	8/08	REVISED	TT
ENGR. MANAGER		2	12/06	REVISED	TOPETE
ENGR. PEV		1	9/99	REVISED	FINCH
DRAWN MJ	CITY OF PALO ALTO CALIFORNIA	NTS	SR-CN-0-1009	1 OF 1	
CHECKED PEV		SCALE	STANDARD NO.	SHEET NO.	

MATERIALS:

1. METER MOUNTING DEVICE WITH MAIN DISCONNECT BUILT INTO THE SAME CABINET.
2. UNDERGROUND SERVICE ENTRANCE CONDUIT RIGID GALVINIZED STEEL OR PVC SCH 40.
3. UNDERGROUND CONDUIT, PVC SCHEDULE 40, TYPE DB–120 OR HOT DIPPED GALVINIZED RIGID STEEL 2" MIN.
4. PLASTIC TO STEEL ADAPTOR, IF PLASTIC CONDUIT IS USED FOR 3.
5. MAY REDUCE NEC REQUIREMENTS





NOTES:

1. STEEL CONDUITS SHALL EXTEND 2" MAX. INTO BOX AND SHALL TERMINATE WITH INSULATED BUSHINGS. PLASTIC CONDUITS SHOULD BE TERMINATED WITH BELL ENDS FLUSH WITH THE WALL OF THE BOX. ALL CONDUIT ENTRANCES SHALL BE GROUTED. SEE CPA STANDARD DRAWING DT–SS–U–1002.
2. IF THE GRADE OF THE BOX IS LESS THAN ONE FOOT BELOW THE END OF THE CONDUIT THAT TERMINATES AT THE BUILDING, BOTH ENDS OF THE SERVICE CONDUIT SHALL BE SEALED WITH APPROVED PLUGS. SUFFICIENT MEASURES SHALL BE PROVIDED TO ENSURE WATER DOES NOT ENTER METER.
3. IF THE GRADE OF THE METER IS BELOW THE GRADE OF THE UTILITY BOX, AN ADDITIONAL BOX MUST BE PLACED IN THE GROUND JUST BEFORE THE METER FOR DETAILS PLEASE CONTACT ELECTRIC ENGINEERING
4. CPAU INSPECTOR MUST BE PRESENT WHEN INSTALLING CONDUIT OR PULLING CABLES INTO CPAU BOX.
5. A SPLICE BOX MAY BE REQUIRED IF CABLE PULLING TENSION WILL BE EXCEEDED.

** CONDUCTOR SIZE IS PER PHASE AND A FULL SIZE NEUTRAL IS REQUIRED.

6. 1½" CONDUIT MAY BE ALLOWED FOR SERVICE LATERALS IF CONDUITS ARE EXISTING, WILL MEET AMPACITY AND CONDUIT FILL REQUIREMENTS, AND IS APPROVED BY CPAU ENGINEERING.

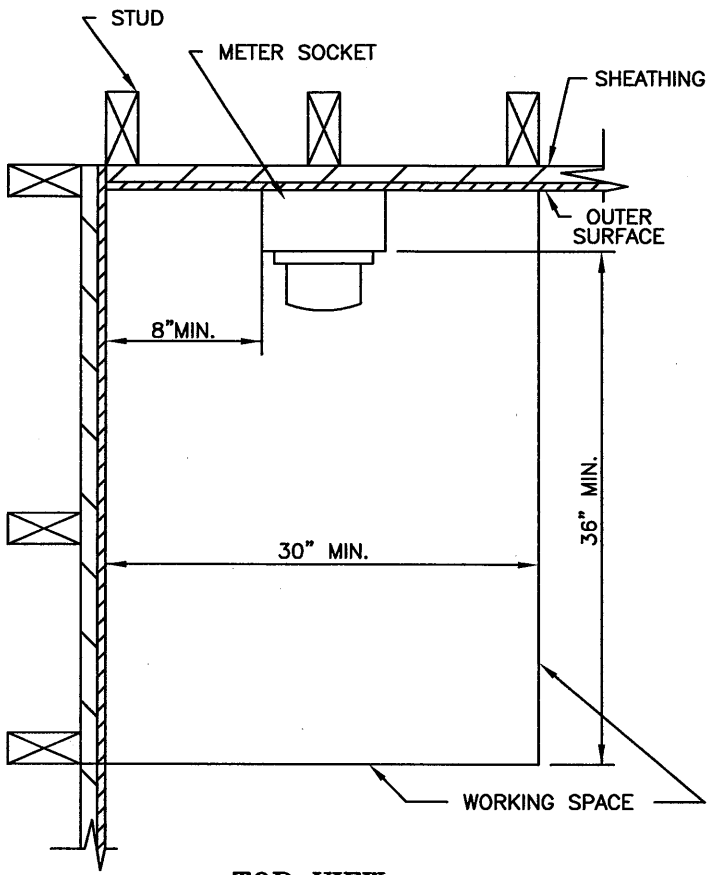
SERVICE LATERAL CONDUIT AND CABLE SIZE

Service Voltage (Volts)	Main Service (Amps)	Customer's Minimum Conduit Size	CPAU Aproved ** Conductor Size AL	CPAU Aproved ** Conductor Size CU
120/240 1-phase 3 wire	125	2"	1/0	2
	200	2"	4/0	2/0
	400*	4"	350	4/0
120/208 1-phase 3 wire	200	2"	4/0	2/0

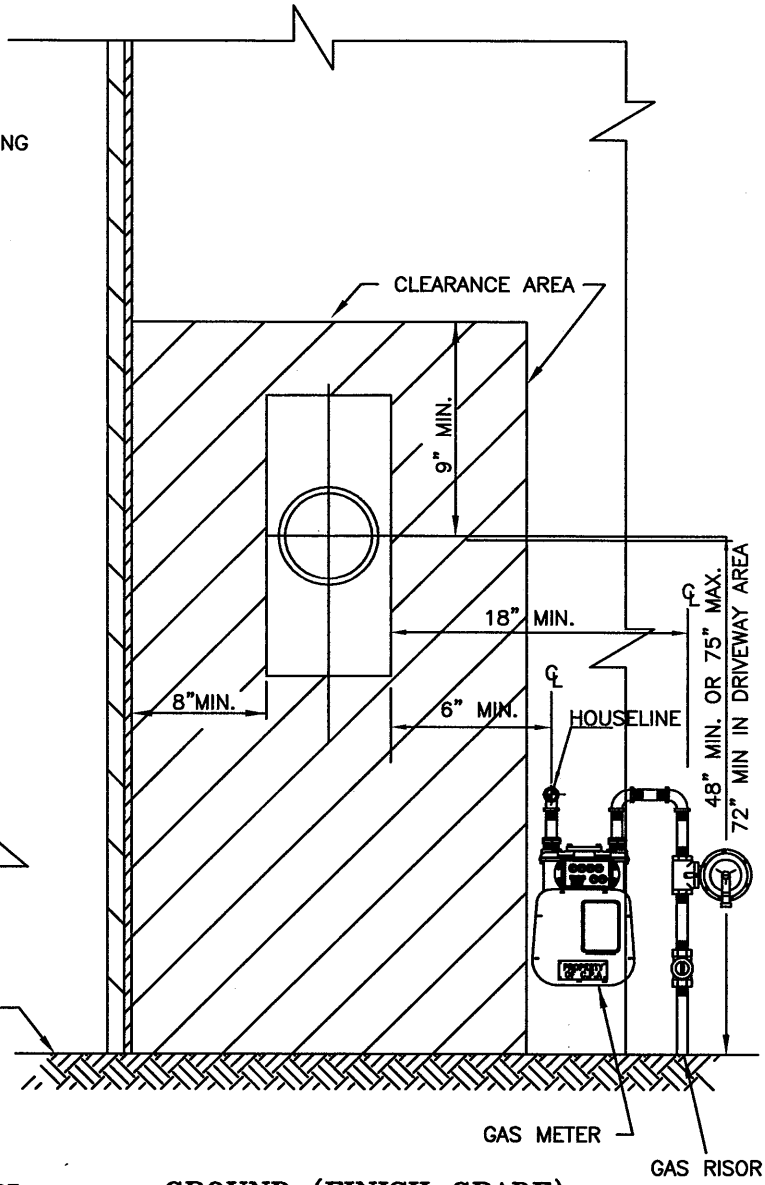
* Note: Class 320 (Underground residential only)

APPROVED 11/2006	ENGINEERING STANDARD		
ENGR. MANAGER	RESIDENTIAL UNDERGROUND SERVICE REQUIREMENTS		
ENGR. PEV		1 10–08	REVISED NOTE 2 TE
DRAWN MJ		REV DATE	DESCRIPTION APPR
CHECKED PEV	CITY OF PALO ALTO CALIFORNIA	NTS	SR–CN–U–1010
		SCALE	STANDARD NO. SHEET NO.

Original Signed and Approved by Engineering Manager



TOP VIEW



GROUND (FINISH GRADE)

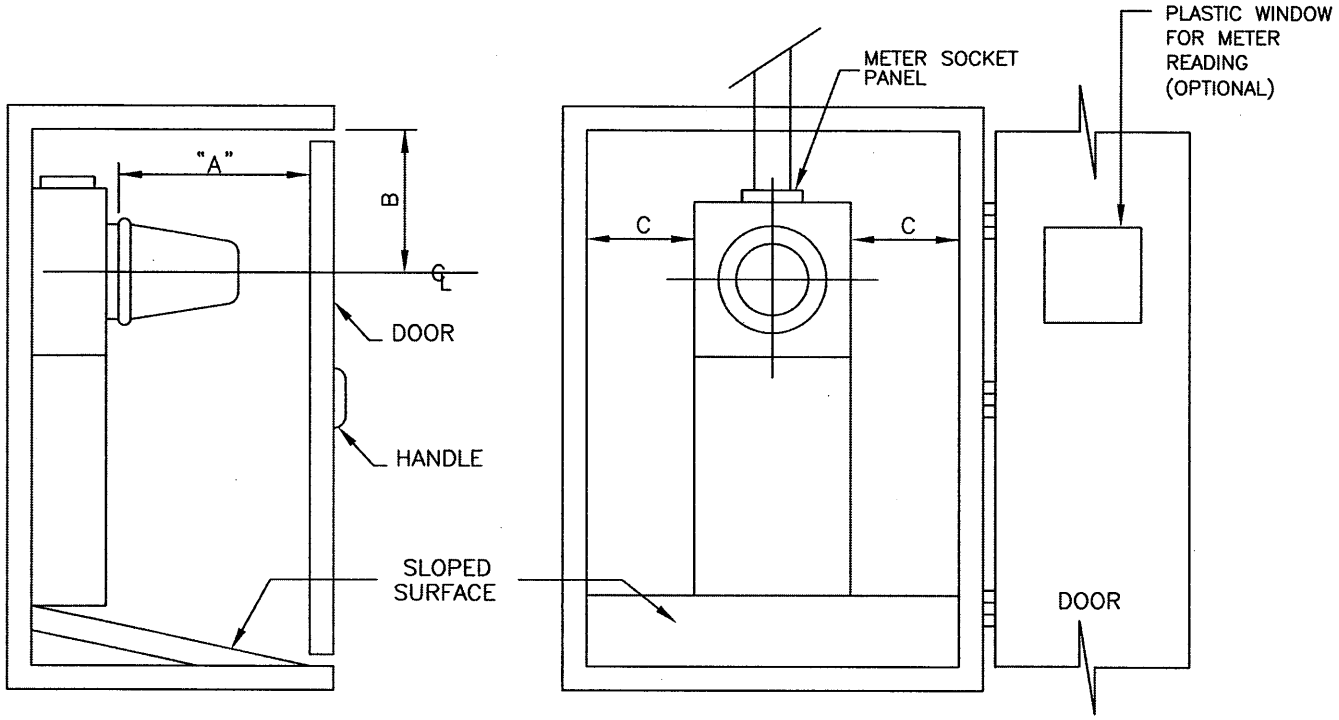
NO WORKING OBSTRUCTIONS ALLOWED IN SHADED AREA.

——— INDICATES BOUNDARY OF AREA WHICH MUST BE KEPT CLEAR OF OBSTRUCTIONS.

NOTES:

1. THERE MUST BE AN 8 INCH MINIMUM CLEARANCE BETWEEN THE NEAREST EDGE OF THE METER PANEL AND ANY OBSTRUCTION.
2. SUITABLE WORKING SPACE, AT LEAST 30 INCHES WIDE X 36 INCHES DEEP, SHALL BE PROVIDED IN FRONT OF THE METER SOCKET TO ALLOW FOR INSTALLATION, TESTING AND READING.
3. METERS SHALL BE LOCATED SO THAT THEY WILL NOT BE DAMAGED BY A SWINGING WINDOW OR DOOR.
4. THE WALL SURFACES ON EITHER SIDE OF A DOOR, FOR A DISTANCE EQUAL TO THE WIDTH OF THE DOOR, IS UNACCEPTABLE AS A METER LOCATION.

APPROVED 3/1994 mDBland ENGR. MANAGER	ENGINEERING STANDARD	3	8-08	REVISED CLEARANCES AND NOTES	TT
	REQUIRED MINIMUM CLEARANCES OF METER SOCKET FROM OBSTRUCTIONS	2	6-06	REVISED CLEARANCES	JT
		1	9-99	REVISED CLEARANCES AND NOTES	TF
		REV	DATE	DESCRIPTION	APPR
ENGR PEV	**CITY OF PALO ALTO** CALIFORNIA	NTS		SR-MT-E-1012	
DRAWN UES/MJ		SCALE		STANDARD NO.	SHEET NO.
CHECKED PEV					



SIDE VIEW

FRONT VIEW

DIMENSION "A" : 7" MINIMUM FOR RESIDENTIAL METERS. 15" MAXIMUM
9" MINIMUM FOR COMMERCIAL AND APARTMENT METERS. 15" MAXIMUM

DIMENSION "B" : 7" MINIMUM FOR RESIDENTIAL METERS.
9" MINIMUM FOR COMMERCIAL AND APARTMENT METERS.

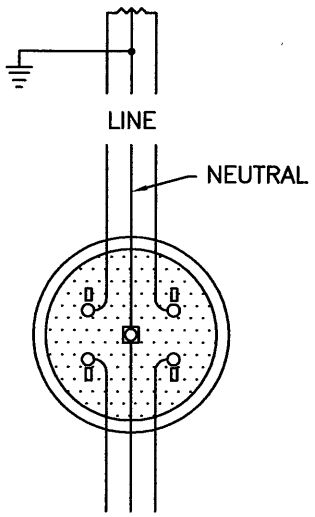
DIMENSION "C" : 2–1/2" MINIMUM FOR RESIDENTIAL METERS.
5" MINIMUM FOR COMMERCIAL AND APARTMENT METERS.

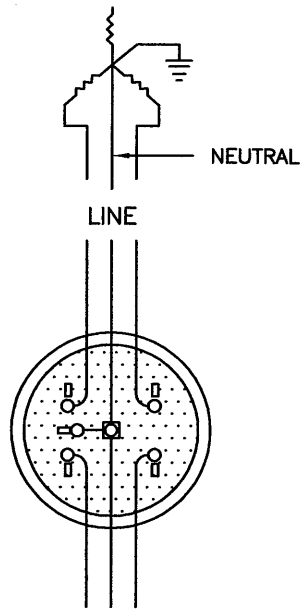
NOTE: DIMENSION "A" APPLIES ONLY TO THAT PORTION OF THE CABINET ENCLOSING DOOR IN FRONT OF THE METER.

NOTE:

1. THE CABINET SHOULD BE DESIGNED SO THAT NEITHER THE ROOF NOR THE DOOR SUPPORTS INTERFERE WITH THE INSTALLATION OF THE METER.
2. AT LEAST 16" VERTICAL AND HORIZONTAL CLEAR SPACE SHALL BE PROVIDED DIRECTLY IN FRONT OF THE SOCKET (8" ABOVE AND BELOW, AND 8" ON EITHER SIDE OF THE CENTER OF THE METER SOCKET).
3. THE CABINET DOORS SHALL HAVE SIDE HINGES, WILL OPEN GREATER THAN 90 DEGREES, AND WILL HAVE A LATCH TO KEEP IT IN THE OPEN POSITION.

APPROVED 199	ENGINEERING STANDARD		
Original Signed and Approved by Engineering Manager	CLEARANCE FOR METER CABINET ENCLOSURES	1 / 11/08 / REVISED NOTES AND DIMENSIONS / TT	
ENGR MANAGER		REV / DATE / DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS / SR-MT-E-1013	1 OF 1
DRAWN ES		SCALE / STANDARD NO.	SHEET NO.
CHECKED PEV			



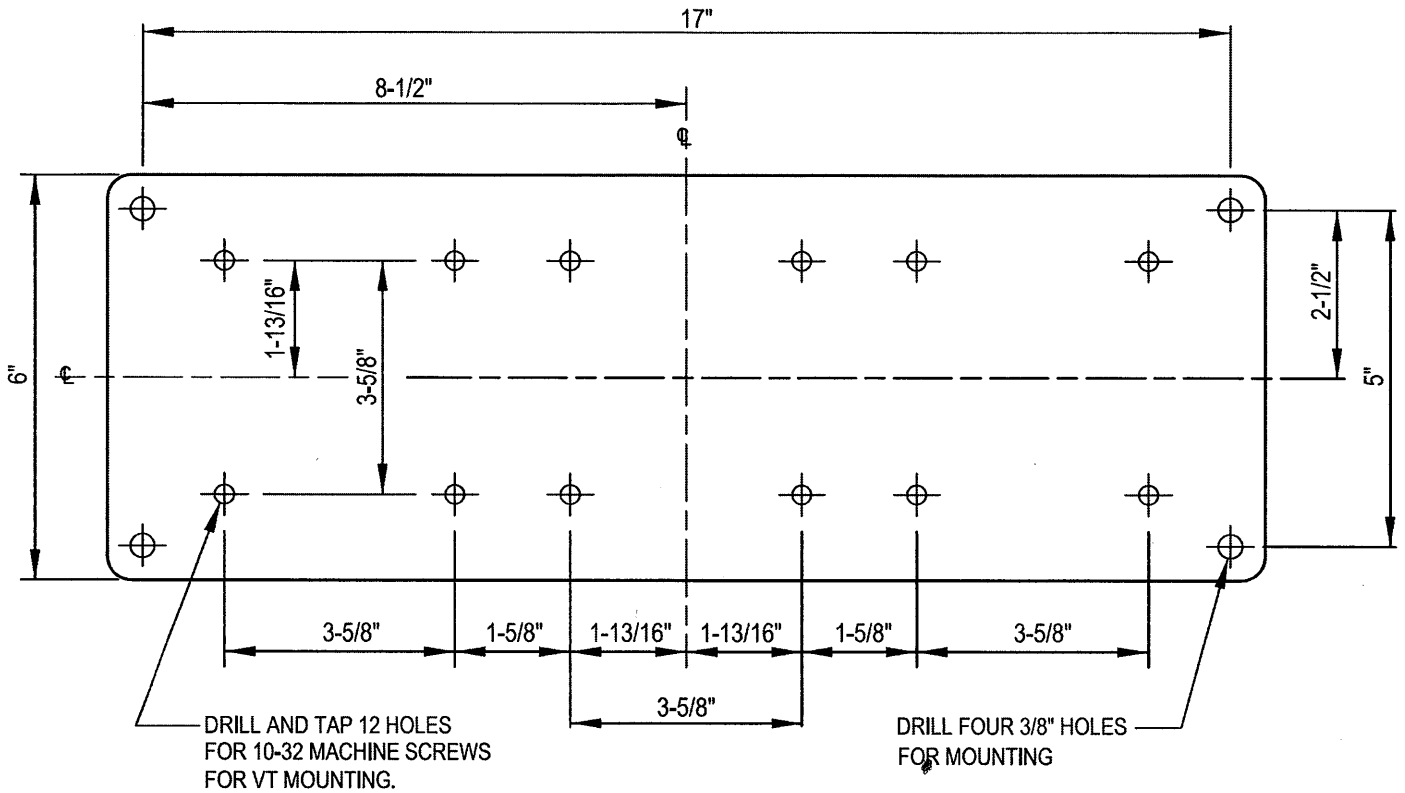


CLASS OF SERVICE	TYPE OF SERVICE	NO. OF JAWS
RESIDENTIAL	120/240 1ø 3W 120/208 1ø 3W/WYE	4 5
COMMERCIAL	120/240 1ø 3W 120/208 1ø 3W/WYE	4 5

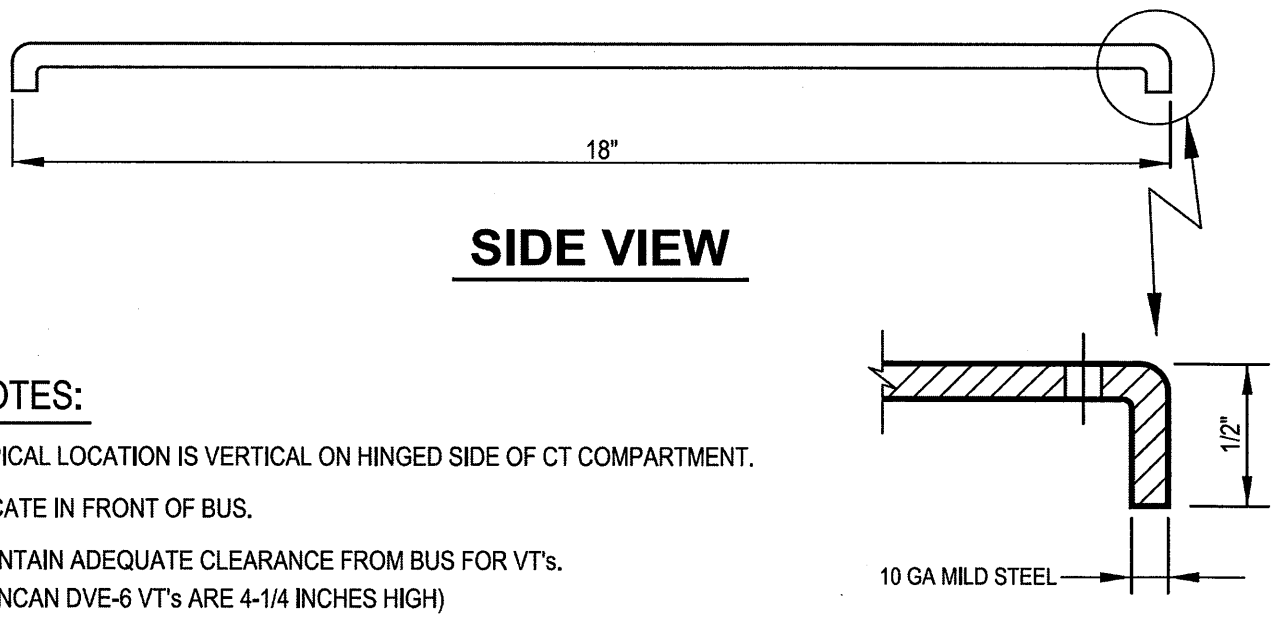
NOTES :

1. SOCKETS FOR RESIDENTIAL INSTALLATIONS 200 A OR LESS SHALL NOT BE EQUIPPED WITH TEST BYPASS DEVICES. TEST BYPASS FACILITIES ARE REQUIRED FOR RESIDENTIAL SERVICES GREATER THAN 200 A.
2. LINE CONDUCTORS SHALL ALWAYS BE CONNECTED TO THE TOP TERMINALS OF THE SOCKET, AND LOAD CONDUCTORS CONNECTED TO THE BOTTOM TERMINALS OF THE SOCKET.
3. NEUTRAL TAPS SHALL BE CONNECTED TO THE SERVICE NEUTRAL CONDUCTOR AND LOCATED BEHIND SEALED PANELS. WIRE NUTS ARE NOT PERMITTED.
4. RESIDENTIAL, SELF–CONTAINED METER SOCKETS SHALL BE UL APPROVED AND SHALL HAVE A MAXIMUM CURRENT RATING EQUAL TO OR GREATER THAN THE CURRENT RATING OF THE ASSOCIATED SERVICE EQUIPMENT.
5. METER SOCKETS WITH EXTRUDED OR CAST ALUMINUM JAWS ARE NOT ACCEPTABLE AND WILL NOT BE CONNECTED.
6. THE NEUTRAL WIRE (WHITE) SHALL BE CONTINUOUS WITHOUT A SPLICE FROM THE WEATHERHEAD THROUGH THE SOCKET BONDING LUG TO THE NEUTRAL BAR IN THE MAIN SWITCH. WITH SPECIAL PERMISSION, THE NEUTRAL WIRE MAY BE BROKEN IF THE SOCKET IS EQUIPPED WITH AN APPROVED CONNECTION DEVICE.

APPROVED 3/1994	ENGINEERING STANDARD				
mDBland	DIAGRAM OF CONNECTIONS, METER SOCKETS FOR SELF–CONTAINED SINGLE PHASE METERS UP TO 400 AMPS	2	8/08	REVISED – Test bypass reqs	TT
ENGR. MANAGER		1	6/99	REVISED	FINCH
		REV	DATE	DESCRIPTION	APPR
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS		SR–MT–E–1014	1 OF 1
DRAWN MJ		SCALE		STANDARD NO.	SHEET NO.
CHECKED PEV					



TOP VIEW



SIDE VIEW

NOTES:

1. TYPICAL LOCATION IS VERTICAL ON HINGED SIDE OF CT COMPARTMENT.
2. LOCATE IN FRONT OF BUS.
3. MAINTAIN ADEQUATE CLEARANCE FROM BUS FOR VT's.
   (DUNCAN DVE-6 VT's ARE 4-1/4 INCHES HIGH)
   (ABB PPW VT's ARE 4-1/2 INCHES HIGH)

APPROVED 03/1997	ENGINEERING STANDARD				
MSB	VOLTAGE TRANSFORMER				
ENGR. MANAGER	MOUNTING PLATE	1	07/05	AS SHOWN	PEV
Original Signed and Approved by Engineering Manager		REV	DATE	DESCRIPTION	APPR
ENGR. PEV	CITY OF PALO ALTO	NTS		SR-MT-M-1019	
DRAWN SES	CALIFORNIA	SCALE		STANDARD NO.	SHEET NO.
CHECKED PEV					

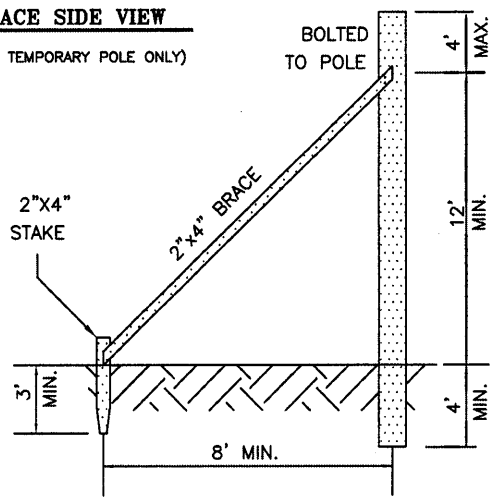
RECOMMENDED SERVICE ENTRANCE CONDUCTOR

Service Voltage (Volts)	Main Service (Amps)	Customer's Minimum Conduit Size	CPAU Aproved Conductor Size AL	CU
120/240 1-phase 3 wire	125	2"	1/0	2
	200	2"	4/0	2/0
	400*	4"	750	500
120/208 1-phase 3 wire	200	2"	4/0	2/0

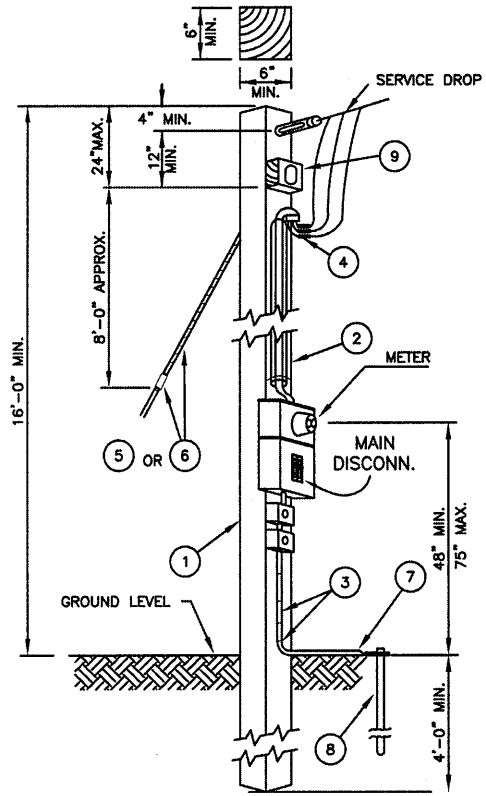
* Note: Class 320 (Residential only)

WOOD BRACE SIDE VIEW

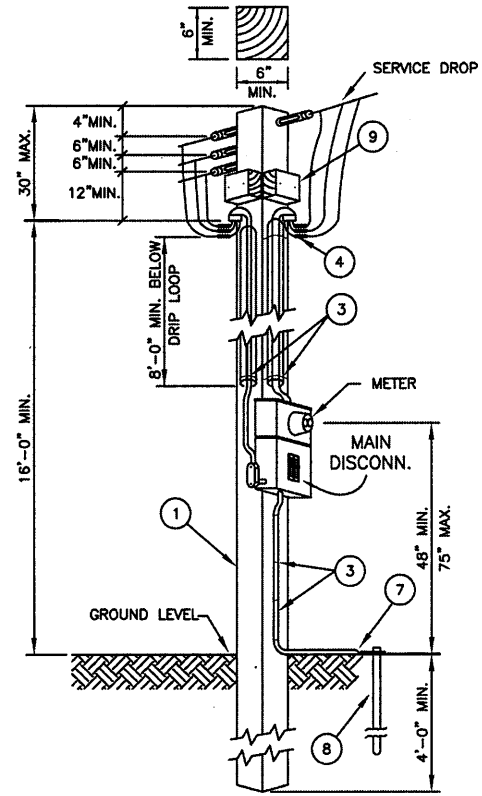
(FOR USE WITH TEMPORARY POLE ONLY)



SERVICE DROP CABLE TO RECEPTACLES



SERVICE DROP CABLE TO OVERHEAD LINE



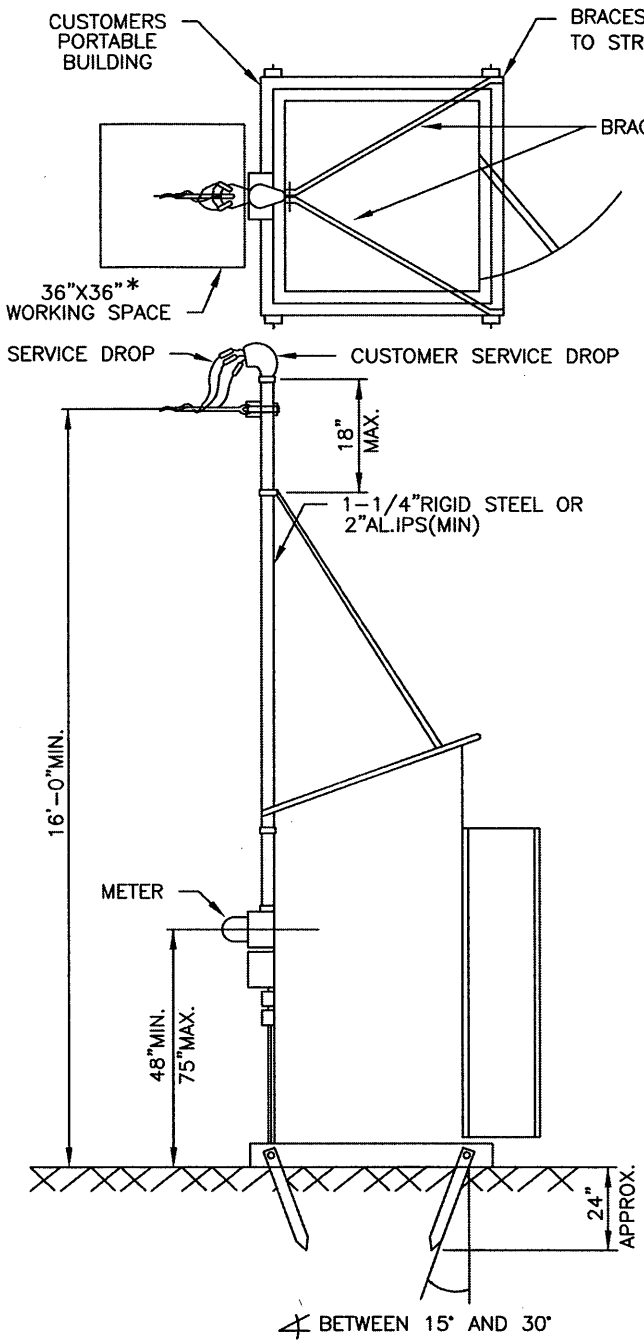
NOTES:

1. POLE – 6"X 6"X 20'-0" (MIN. LENGTH)
2. CONDUIT – RIGID STEEL, GALV., EMT OR PVC SCH 40
3. CONDUIT – RIGID STEEL, GALV WITH PIPE STRAP
4. WIRE, INSULATED, SIZE AS REQ'D. (24" MIN. EXTENSION FROM WEATHERHEAD FOR DRIP LOOP)
5. GUY CABLE – 1/4" MIN. GALV. STEEL WITH GUY STRAIN INSULATOR (10,000 LB. MIN.), ANCHOR AND FITTINGS.
6. PUSH BRACE – 2" X 4" MIN. TIMBER (SECURED TO OR NAILED TO POLE)
7. CONDUIT GROUNDING HUB AND CLAMP
8. GROUND – 5/8" X 8' ROD
9. WOOD BLOCK – 4" X 4" X 6"

APPROVED 12/2006	ENGINEERING STANDARD		
Original Signed and Approved by Engineering Manager	OVERHEAD TEMPORARY SERVICE		
ENGR PEV	CITY OF PALO ALTO CALIFORNIA	NTS	SR-TS-O-1006
DRAWN MJ		SCALE	STANDARD NO.
CHECKED PEV			

REV	DATE	DESCRIPTION	APPR
3	11/08	REVISED	TT
2	12/06	REVISED	TOPETE
1	6/99	REVISED	FINCH

1 of 1
SHEET NO.



* FOOTNOTE:

WORKING SPACE IN FRONT OF METER SHALL NOT BE OBSTRUCTED.

TEMPORARY SERVICE ATTACHMENT

TEMPORARY SERVICES SHALL NOT ATTACH TO ANY STRUCTURE CONSIDERED TO BE OF INADEQUATE STRENGTH. THE STRUCTURE SHALL BE WELL-FIXED AND CAPABLE OF SUPPORTING THE SERVICE SPAN.

PORTABLE BUILDINGS

SMALL SHEDS, OFFICES, TOILETS, ETC. ARE NOT CONSIDERED WELL-FIXED UNLESS STAKED IN PLACE AS SHOWN.

ANCHORING:

THE STRUCTURE SHOULD BE SECURELY ANCHORED IN PLACE BY ONE OF THE FOLOWING:

1. FOUR 2"X4"MIN. WOOD STAKES DRIVEN AT LEAST 2' INTO THE GROUND AND ATTACHED TO THE STRUCTURE'S FRAMEWORK.
2. FOUR STEEL STAKES, WITH STRENGTH EQUIVALENT TO 3/4" RIGID STEEL PIPE, DRIVEN AT LEAST 2' INTO THE GROUND AND ATTACHED TO THE STRUCTURE'S FRAME-WORK BY 1/4" MIN. BOLTS OR LAG SCREWS. STEEL STAKES MAY ALSO BE SECURED BY CROSSMEMBERS FIRMLY CONTACTING THE UPPER SURFACE OF THE BASE OF THE STRUCTURE.

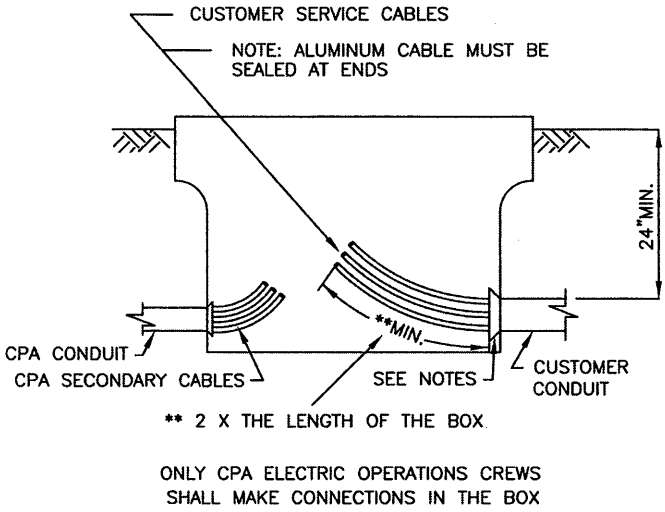
   CONTACT UNDERGROUND SERVICE ALERT AT 1-800-227-2600 TO LOCATE UNDERGROUND FACILITIES PRIOR TO INSTALLING ANCHORS.

PERISCOPE MAST BRACING

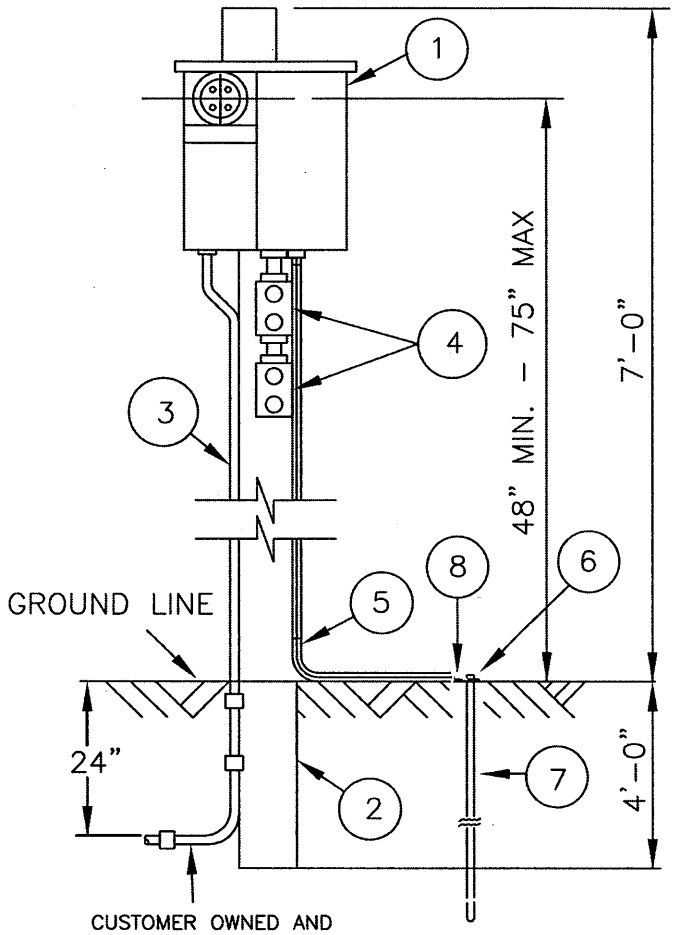
TWO GALVANIZED STEEL BRACES (3/4"GAL. RIGID STEEL PIPE OR 1-1/14"X1-1/4"X1/8" GAL. STEEL ANGLE MIN.) SECURELY BOLTED OR LAGGED TO THE FRAMEWORK WITH A 90 SPREAD SHALL BE INSTALLED.

APPROVED ____ 199	ENGINEERING STANDARD				
ENGR MANAGER	TEMPORARY SERVICE OUTHOUSE	1	8/08	REVISED	TT
ENGR PEV		REV	DATE	DESCRIPTION	APPR
DRAWN JES	CITY OF PALO ALTO CALIFORNIA	NTS	SR-TS-0-1007		
CHECKED PEV		SCALE	STANDARD NO.		SHEET NO.

Original Signed and Approved by Engineering Manager



ONLY CPA ELECTRIC OPERATIONS CREWS SHALL MAKE CONNECTIONS IN THE BOX



MATERIALS:

1. SERVICE TERMINATION ENCLOSURE, COMBINATION METER SOCKET PANEL AND MAIN DISCONNECT
2. POST, MIN. DIM. 4" X 4" X 11'–0".
3. CONDUIT, RIGID STEEL, GALVANIZED OR PVC SCH 40, MIN. SIZE 2".
4. WEATHERPROOF OUTLETS.
5. CONDUIT, RIGID STEEL GALVANIZED WITH PIPE STRAP.
6. HUB AND CLAMP GROUNDING.
7. GROUND ROD, 5/8" X 8'
8. GROUND WIRE, BARE COPPER (SIZE IN ACCORDANCE WITH ELECT. CODES & LOCAL REQ.)

SERVICE LATERAL CONDUIT AND CABLE SIZE

Service Voltage (Volts)	Main Service (Amps)	Customer's Minimum Conduit Size	CPAU Aproved ** Conductor Size AL	CU
120/240 1-phase 3 wire	125	2"	1/0	2
	200	2"	4/0	2/0
	400*	4"	350	4/0
120/208 1-phase 3 wire	200	2"	4/0	2/0

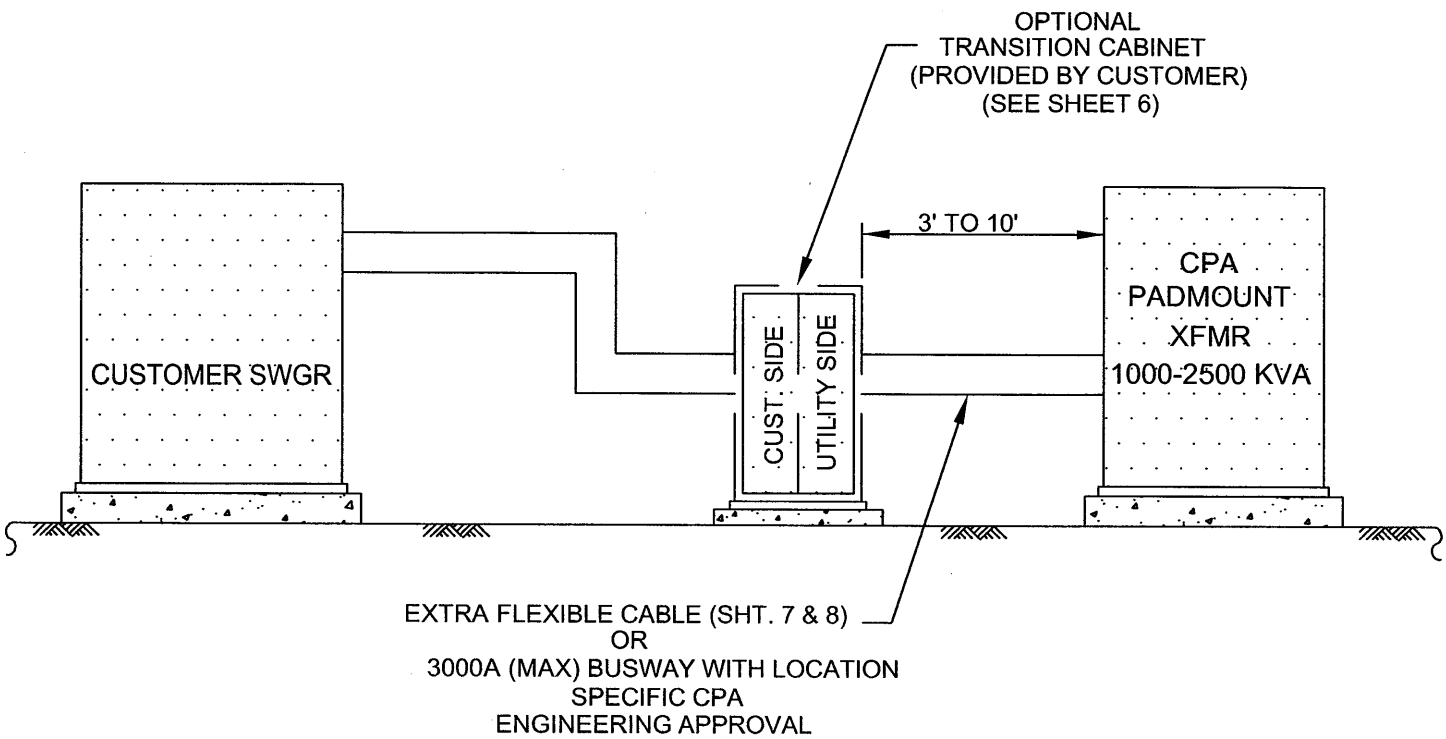
* Note: Class 320 (Underground residential only)

NOTE:

TRENCH TO BE INSPECTED BY THE ELECTRIC UNDERGROUND INSPECTOR PRIOR TO BACKFILLING. INSPECTOR MUST BE PRESENT WHEN INSTALLING CONDUIT OR PULLING CABLE INTO CPAU BOX.

** CONDUCTOR SIZE IS PER PHASE AND A FULL SIZE NEUTRAL IS REQUIRED.

APPROVED 11/2006 Original Signed and Approved by Engineering Manager	ENGINEERING STANDARD			
	UNDERGROUND TEMPORARY SERVICE	1	8/08	REVISED TP
ELEC. ENGR. MANAGER		REV	DATE	DESCRIPTION APPR
ENGR. PEV	CITY OF PALO ALTO CALIFORNIA	NTS	SR–TS–U–1008	
DRAWN BES				
CHECKED PEV		SCALE	STANDARD NO.	SHEET NO.



NOTES:

1. STANDARD SECONDARY CONNECTION SHALL BE MADE WITH EXTRA FLEXIBLE CABLE AS SHOWN ON SHT. 7 & 8. ALTERNATIVELY, A BUSWAY ASSEMBLY AS SHOWN ON SHT. 5 MAY BE USED, WITH UTILITIES' APPROVAL, TO CONNECT THE TRANSFORMER SECONDARY TERMINALS TO THE BUSWAY INSIDE THE TRANSFORMER SECONDARY COMPARTMENT.
2. FOR SERVICES LARGER THAN 1600 AMPS, THE CUSTOMER MAY INSTALL BUSWAY FROM THE CUSTOMER'S SWITCHGEAR DIRECTLY TO UTILITY'S PADMOUNT TRANSFORMER, WITH UTILITIES' APPROVAL.
3. ANY ATTACHMENT TO THE TRANSFORMER SECONDARY TERMINALS SHALL BE PERFORMED BY UTILITIES USING HARDWARE PROVIDED BY THE CUSTOMER, INCLUDING LUGS AND BRAIDED CABLE. ALL LABOR AND MATERIALS UP TO THAT POINT OF ATTACHMENT SHALL BE PROVIDED BY THE CUSTOMER.
4. ALL BUSWAY DESIGN AND CONFIGURATION SHALL BE SUBMITTED TO UTILITIES FOR REVIEW & APPROVAL PRIOR TO PROCUREMENT AND FABRICATION.
5. BUSWAY SHALL CONFORM TO ARTICLE 364 OF THE NATIONAL ELECTRICAL CODE.
6. BUSWAY SHALL BE RATED ACCORDING TO THE SERVICE ENTRANCE OVERCURRENT PROTECTION DEVICE AND FABRICATED PER ANSI 37.23.
7. THE DESIGNATED SERVICE POINT SHALL BE THE SECONDARY TERMINALS OF THE TRANSFORMER.
8. THE TRANSITION CABINET SHALL BE FABRICATED PER DRAWING # SR-XF-E-1020 SHT. 6 OR APPROVED EQUIVALENT.

REV.	DATE	APPR.	DESCRIPTION
4	12/08	TING	REVISED NOTES
3	02/06	BUJTOR	CONVERTED TO A'CAD, REVI'SD. NOTES & ADDED DWG. NO.
2	06/99	FINCH	REVISED NOTES
1	3/94	APPR.	DRAWING RENAMED

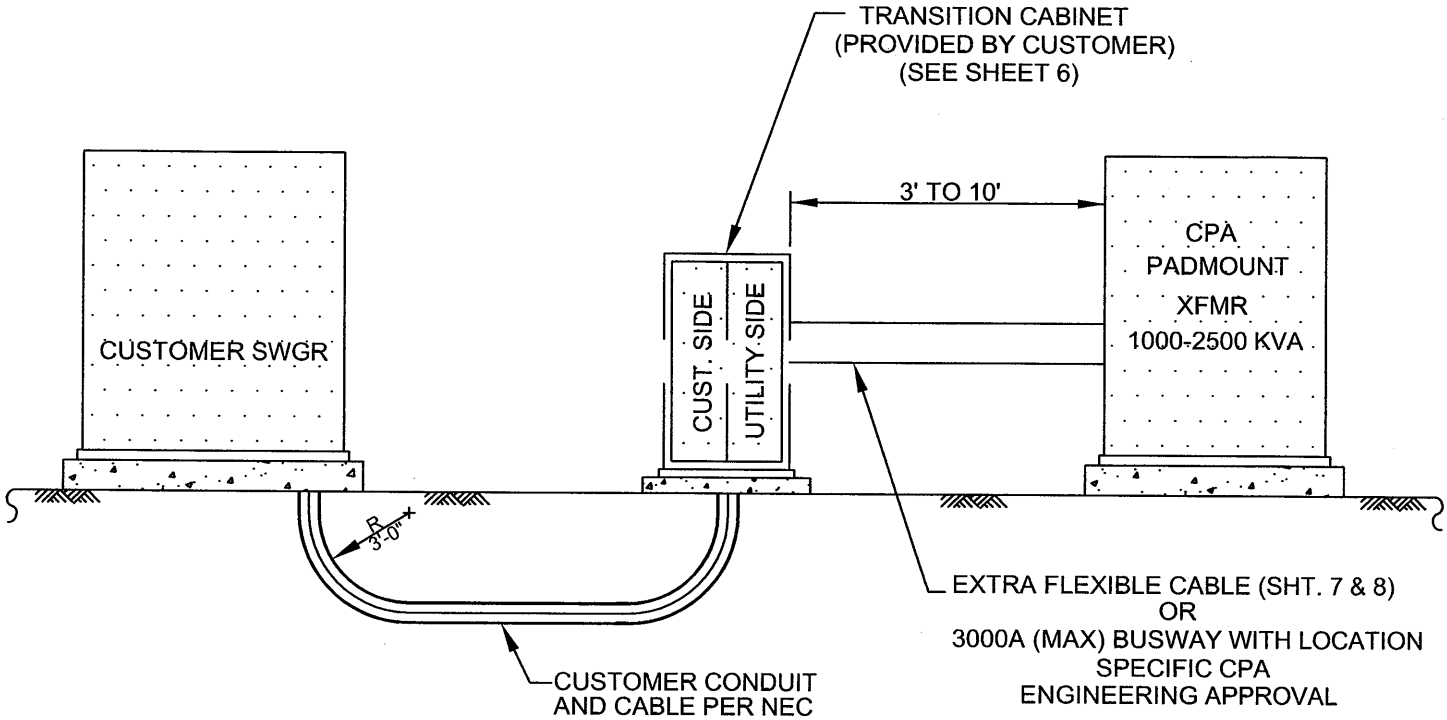
APPROVED _____
SR. ENGINEER / MANAGER

ENGR.	G. Jagannath	
DRWN	M. Jamshid	
CHKD.	P. Valath	

TRANSITION CABINET
FOR 1000-2500 KVA TRANSFORMER

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	SR-XF-E-1020
			SHEET 1 OF 8



NOTES:

1. STANDARD SECONDARY CONNECTION SHALL BE MADE WITH EXTRA FLEXIBLE CABLE AS SHOWN ON SHT. 7 & 8. ALTERNATIVELY, A BUSWAY ASSEMBLY AS SHOWN ON SHT. 5 MAY BE USED, WITH UTILITIES' APPROVAL, TO CONNECT THE TRANSFORMER SECONDARY TERMINALS TO THE BUSWAY INSIDE THE TRANSFORMER SECONDARY COMPARTMENT.
2. THE CUSTOMER MAY, WITH UTILITIES' APPROVAL, INSTALL BUSWAY FROM TRANSFORMER TO TRANSITION CABINET AND CABLES FROM TRANSITION CABINET TO CUSTOMER SWITCHGEAR FOR TRANSFORMERS RATED 1000 KVA TO 2500 KVA.
3. ANY ATTACHMENT TO THE TRANSFORMER SECONDARY TERMINALS SHALL BE PERFORMED BY UTILITIES USING HARDWARE PROVIDED BY THE CUSTOMER, INCLUDING LUGS AND BRAIDED CABLE. ALL LABOR AND MATERIALS UP TO THAT POINT OF ATTACHMENT SHALL BE PROVIDED BY THE CUSTOMER.
4. ALL BUSWAY DESIGN AND CONFIGURATION SHALL BE SUBMITTED TO UTILITIES FOR REVIEW & APPROVAL PRIOR TO PROCUREMENT AND FABRICATION.
5. BUSWAY SHALL CONFORM TO ARTICLE 364 OF THE NATIONAL ELECTRICAL CODE.
6. BUSWAY SHALL BE RATED ACCORDING TO THE SERVICE ENTRANCE OVERCURRENT PROTECTION DEVICE AND FABRICATED PER ANSI 37.23.
7. THE DESIGNATED SERVICE POINT SHALL BE THE SECONDARY TERMINALS OF THE TRANSFORMER.
8. THE TRANSITION CABINET SHALL BE FABRICATED PER DRAWING # SR-XF-E-1020 SHT. 6 OR APPROVED EQUIVALENT.

REV.	DATE	APPR.	DESCRIPTION
4	12/08	TING	REVISED NOTES
3	02/06	BUJTOR	CONVERTED TO A'CAD, REVI'SD. NOTES & ADDED DWG. NO.
2	06/99	FINCH	REVISED NOTES
1	3/94	APPR.	DRAWING RENAMED

APPROVED

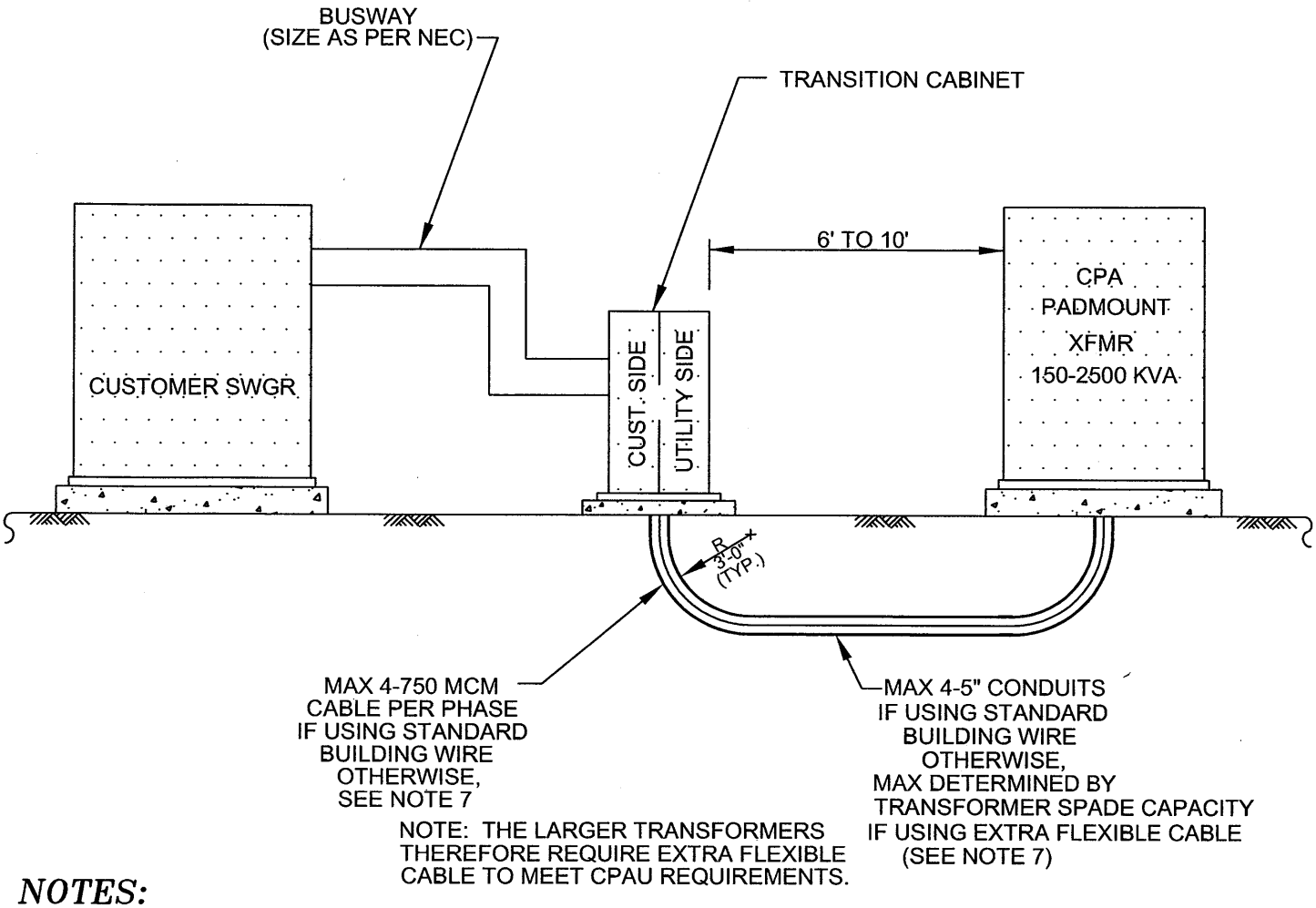
SR. ENGINEER / MANAGER

ENGR.	G. Jagannath	
DRWN	M. Jamshid	
CHKD.	P. Valath	

TRANSITION CABINET
FOR 1000-2500 KVA TRANSFORMER

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	SR-XF-E-1020



NOTE: THE LARGER TRANSFORMERS THEREFORE REQUIRE EXTRA FLEXIBLE CABLE TO MEET CPAU REQUIREMENTS.

NOTES:

1. UTILITIES SHALL FURNISH, INSTALL AND CONNECT THE SERVICE LATERAL CONDUCTORS BETWEEN THE TRANSITION CABINET AND TRANSFORMER SECONDARY TERMINALS IF STANDARD BUILDING WIRE IS USED. OTHERWISE THE CUSTOMER FURNISHES AND INSTALLS EXTRA FLEXIBLE CABLE PER SHT. 7 & 8 IN ACCORDANCE WITH CPAU DRAWING # DT-SE-U-1032.
2. CUSTOMER HAS THE OPTION TO INSTALL BUSWAY FROM THE CABINET TO THE SWITCHGEAR.
3. ALL BUSWAY DESIGN AND CONFIGURATION SHALL BE SUBMITTED TO UTILITIES FOR REVIEW AND APPROVAL PRIOR TO PROCUREMENT AND FABRICATION.
4. BUSWAY SHALL CONFORM TO ARTICLE 364 OF THE NATIONAL ELECTRICAL CODE.
5. THE DESIGNATED SERVICE POINT SHALL BE THE CUSTOMER SUPPLIED TRANSITION CABINET IF USING STANDARD BUILDING CABLE, THE SECONDARY TERMINALS OF THE TRANSFORMER IF USING EXTRA FLEXIBLE CABLE.
6. THE TRANSITION CABINET SHALL BE FABRICATED PER DRAWING # SR-XF-E-1020 SHT. 6 OR APPROVED EQUIVALENT.
7. IF USING EXTRA FLEXIBLE CABLE WHERE CABLE AND CONDUITS PER PHASE CAN BE EXCEEDED, CONFIRM THAT TRANSFORMER SPADES HAVE ENOUGH QUANTITY CONNECTOR HOLES AND HAVE VERTICAL STRUCTURAL SUPPORTS (REF. SHT. 7 & 8).
8. UTILTIES (AT CUSTOMER'S EXPENSE) WILL PROVIDE LUGS ON THE TRANFORMER SECONDARY TERMINALS AND ON THE UTILITY SIDE OF THE TRANSITION CABINET FOR STANDARD BUILDING WIRE.

REV.	DATE	APPR.	DESCRIPTION
4	12/08	TING	REVISED NOTES
3	02/06	BUJTOR	CONVERTED TO A'CAD, REVI'SD. NOTES & ADDED DWG. NO.
2	06/99	FINCH	REVISED NOTES
1	3/94	APPR.	DRAWING RENAMED

APPROVED

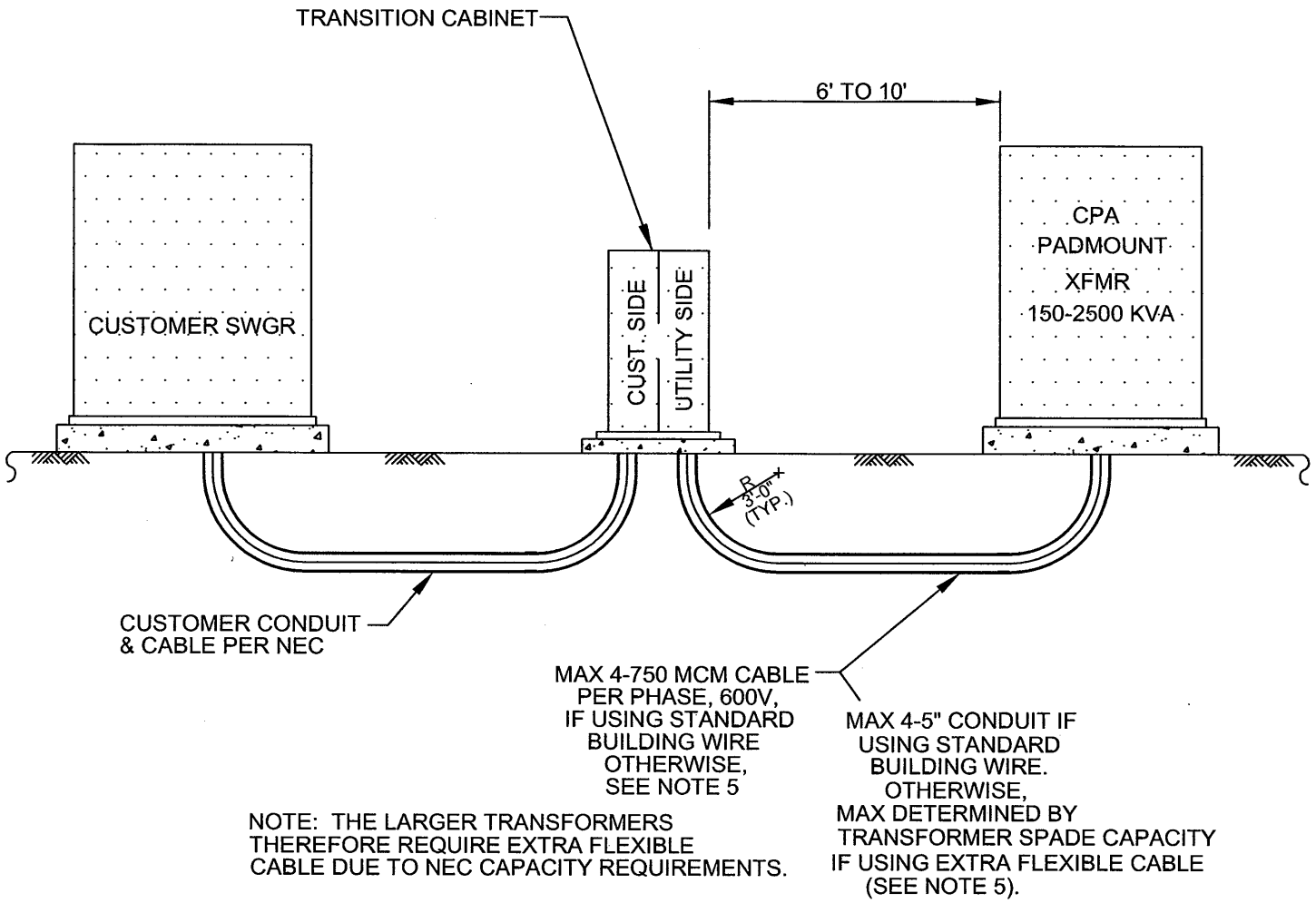
SR. ENGINEER / MANAGER

ENGR.	G. Jagannath	
DRWN	M. Jamshid	
CHKD.	P. Valath	

TRANSITION CABINET
FOR 150-2500 KVA TRANSFORMER

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	SR-XF-E-1020
			SHEET 3 OF 8



NOTE: THE LARGER TRANSFORMERS THEREFORE REQUIRE EXTRA FLEXIBLE CABLE DUE TO NEC CAPACITY REQUIREMENTS.

NOTES:

1. THE CITY SHALL FURNISH, INSTALL AND CONNECT THE SERVICE LATERAL CONDUCTORS BETWEEN THE TRANSITION CABINET AND TRANSFORMER SECONDARY TERMINALS IF STANDARD BUILDING WIRE IS USED. OTHERWISE THE CUSTOMER FURNISHES AND INSTALLS EXTRA FLEXIBLE CABLE PER SHT. 7 & 8 IN ACCORDANCE WITH CPAU DRAWING # DT-SE-U-1032.
2. CUSTOMER SHALL INSTALL CABLES FROM THE TRANSITION CABINET TO THE SWITCHGEAR.
3. THE DESIGNATED SERVICE POINT SHALL BE THE CUSTOMER SUPPLIED TRANSITION CABINET.
4. THE TRANSITION CABINET SHALL BE FABRICATED PER DRAWING # SR-XF-E-1020 SHT. 6 OR APPROVED EQUIVALENT.
5. IF USING EXTRA FLEXIBLE CABLE WHERE CABLE AND CONDUITS PER PHASE CAN BE EXCEEDED, CONFIRM THAT TRANSFORMER SPADES HAVE ENOUGH QUANTITY CONNECTOR HOLES AND HAVE VERTICAL STRUCTURAL SUPPORTS (REF. SHT. 7 & 8).
6. UTILTIES (AT CUSTOMER'S EXPENSE) WILL PROVIDE LUGS ON THE TRANFORMER SECONDARY TERMINALS AND ON THE UTILITY SIDE OF THE TRANSITION CABINET.

REV.	DATE	APPR.	DESCRIPTION
4	12/08	TING	REVISED NOTES
3	02/06	BUJTOR	CONVERTED TO A'CAD, REVI'SD. NOTES & ADDED DWG. NO.
2	06/99	FINCH	REVISED NOTES
1	3/94	APPR.	DRAWING RENAMED

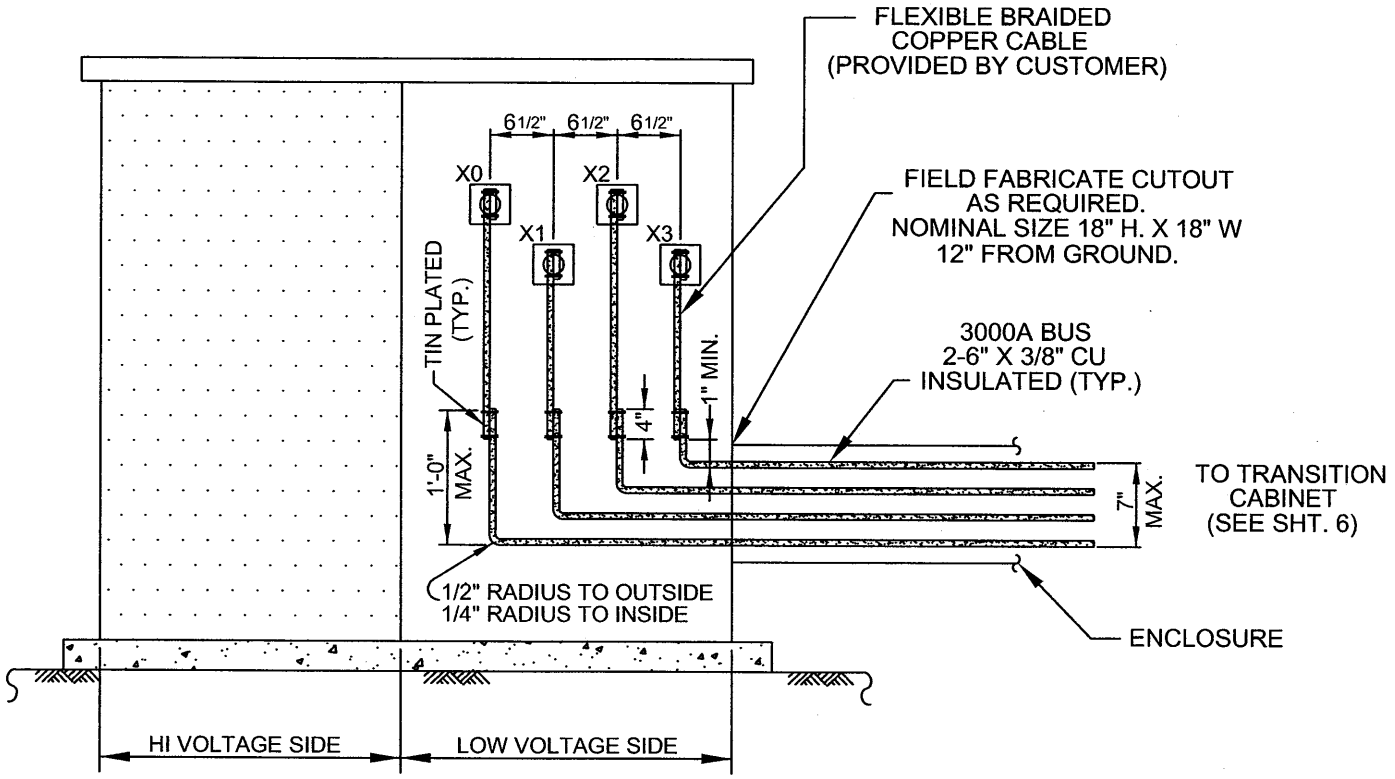
APPROVED _____
SR. ENGINEER / MANAGER

ENGR.	G. Jagannath	
DRWN	M. Jamshid	
CHKD.	P. Valath	

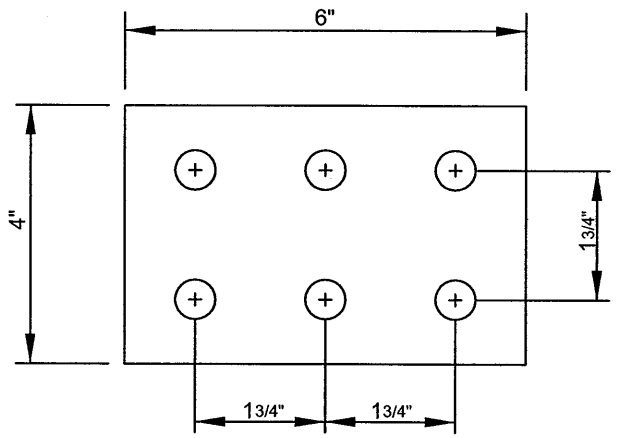
TRANSITION CABINET
FOR 150-2500 KVA TRANSFORMER

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	SR-XF-E-1020
			SHEET 4 OF 8



PADMOUNT 3–PHASE DISTRIBUTION TRANSFORMER 1000–2500 KVA



PAD VIEW
(TYPICAL)

NOTES:

1. STANDARD SECONDARY CONNECTION WILL BE MADE WITH EXTRA FLEXIBLE CABLE AS SHOWN ON SHTS. 7 & 8. THIS BUSWAY ARRANGEMENT IS WITH LOCATION SPECIFIC CPA ENGINEERING APPROVAL ONLY. REFERENCE SHTS. 1 & 2.

APPROVED _____
SR. ENGINEER / MANAGER

ENGR.	G. Jagannath	
DRWN	M. Jamshid	
CHKD.	P. Valath	

3000 AMP BUSWAY
ARRANGEMENT AT TRANSFORMER

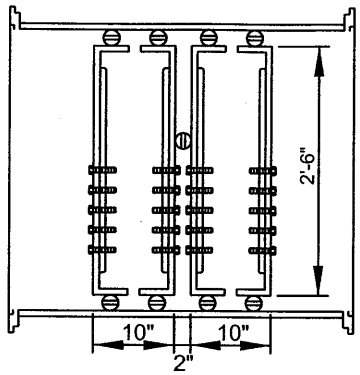
City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

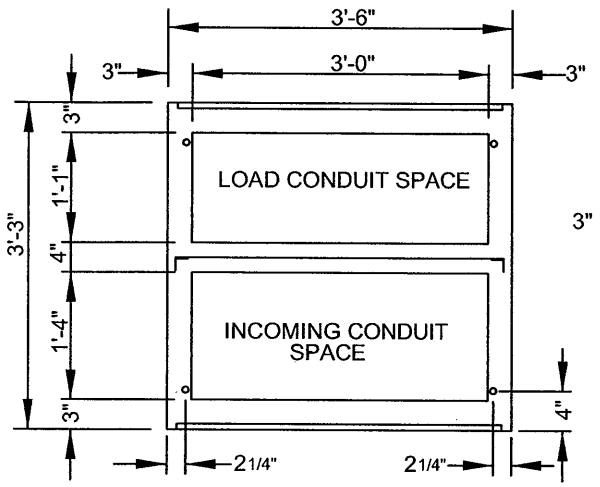
REV.	DATE	APPR.	DESCRIPTION
1	3/94	APPR.	DRAWING RENAMED
2	06/99	FINCH	REVISED NOTES
3	02/06	BUJTOR	CONVERTED TO A'CAD, REVI'SD. NOTES & ADDED DWG. NO.

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	SR-XF-E-1020
			SHEET 5 OF 8

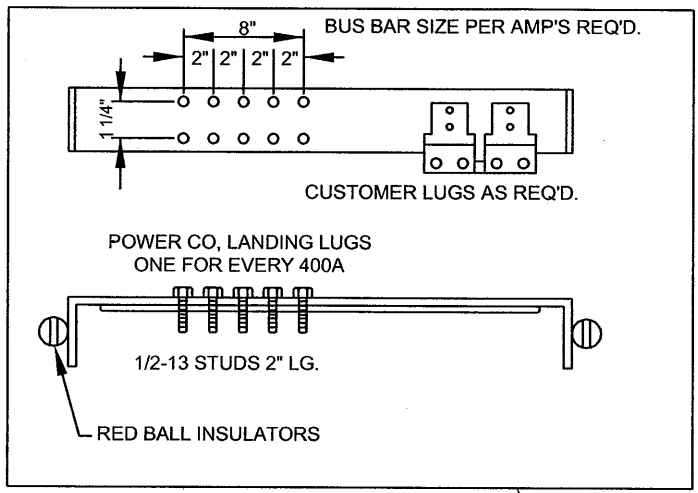
NOTES:

1. SCREWS SHALL BE PROVIDED FOR THE TRANSITION CABINET COVERS BY THE MANUFACTURER AS REQUIRED.
2. TWO SEALABLE STUDS WITH WING NUTS SHALL BE PROVIDED FOR EACH TRANSITION CABINET COVER.
3. TRANSITION CABINET WILL BE I.E.M. OR APPROVED EQUIVALENT.

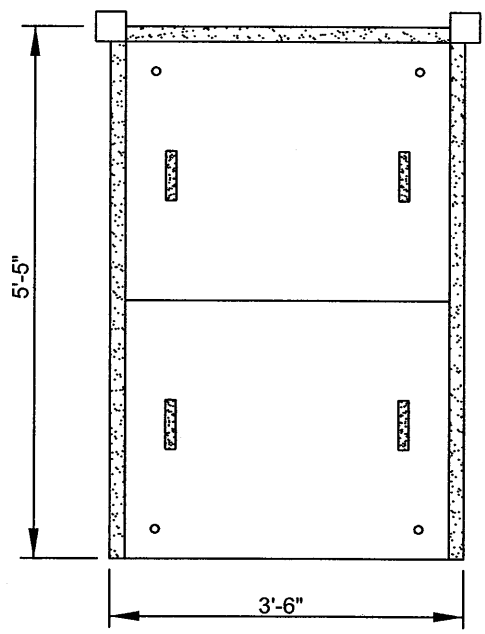




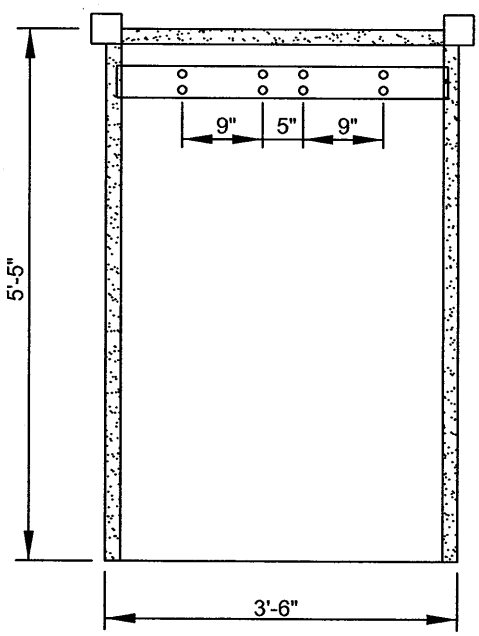
BASE DETAIL



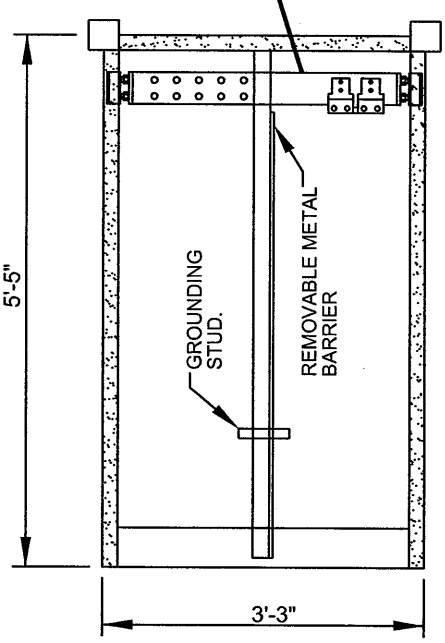
BLOW UP VIEW



FRONT VIEW



FRONT INTERIOR VIEW



SIDE VIEW

APPROVED

SR. ENGINEER / MANAGER

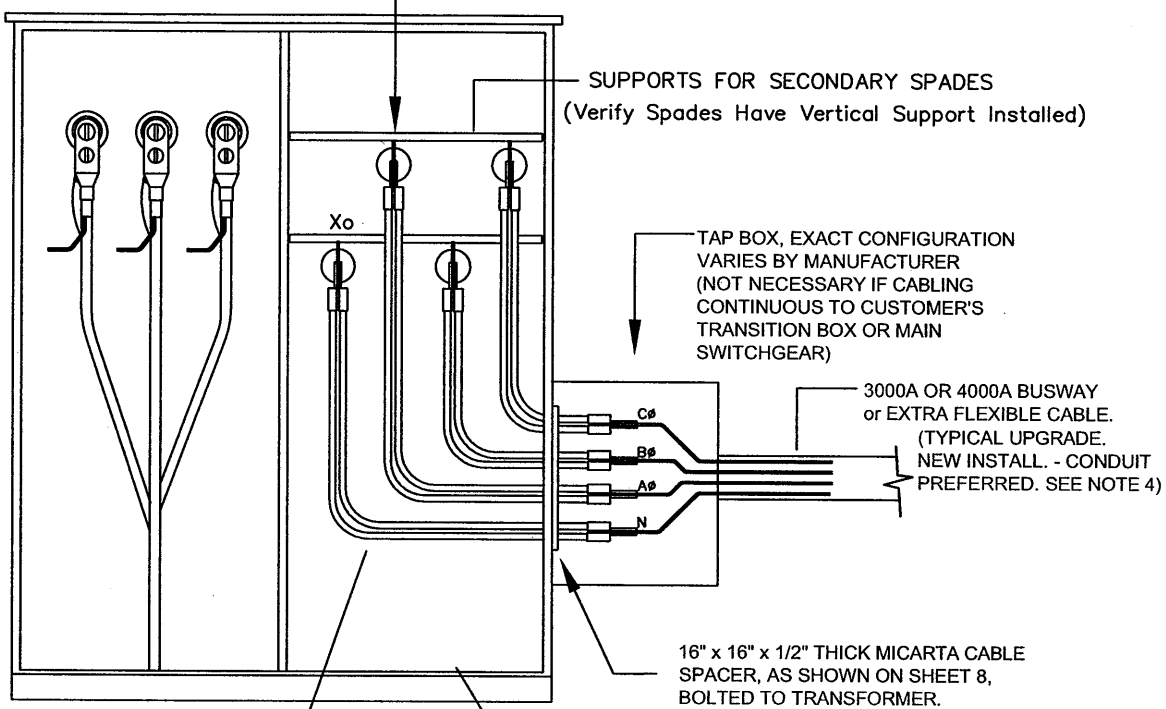
ENGR.	G. Jagannath	
DRWN	M. Jamshid	
CHKD.	P. Valath	

TYPICAL TRANSITION CABINET
FOR LARGE SERVICES

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

REV.	DATE	APPR.	DESCRIPTION
1	3/94	APPR.	DRAWING RENAMED
2	06/99	FINCH	REVISED NOTES
3	02/06	BUJTOR	CONVERTED TO A'CAD, REVI'SD. NOTES & ADDED DWG. NO.

MAP #	CKT #	SCALE	S.O.# / DRAWING #
XX	XX	NTS	SR-XF-E-1020
			SHEET 6 OF 8



UTILITY GUIDE ONLY:

750 KVA:	3 CONDUCTORS PER PHASE AND NEUTRAL
1000 KVA:	4 CONDUCTORS PER PHASE AND NEUTRAL
1500 KVA:	4 CONDUCTORS PER PHASE AND NEUTRAL
2000 KVA:	6 CONDUCTORS PER PHASE AND NEUTRAL
2500 KVA:	7 CONDUCTORS PER PHASE AND NEUTRAL

NOTES:

1. CABLE TO BE SIZED PER CPAU DWG # DT-SE-U-1032. IF USING ALTERNATE CONDUIT LOCATION, STANDARD CABLE MAY BE USED, NOT TO EXCEED 4-750 MCM PER PHASE AND IN ACCORDANCE WITH CPAU DWG # DT-SE-U-1032.
2. THE DESIGNATED SERVICE POINT PER THE NATIONAL ELECTRIC CODE SHALL BE THE SECONDARY TERMINALS AT THE TRANSFORMER.
3. THE CUSTOMER SHALL FURNISH ALL HARDWARE AND MATERIALS NEEDED FOR A COMPLETE INSTALLATION.
4. IF GREATER THAN 3000A SERVICE, CALL CPA UTIL. ENGR. DEPT. AT 566-4500. USE OF 750KCMIL AND ELIMINATION OF TRANSITION CABINET MAY BE POSSIBLE.
5. CABLING BETWEEN TRANSFORMER AND CUSTOMER'S SWITCHGEAR SHALL BE SIZED PER CPAU DWG # DT-SE-U-1032 IF NOT USING A TRANSITION CABINET.

4	12/08	TING	REVISED NOTES
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APPROVED _____

Original Signed and Approved by Engineering Manager

SR. ENGINEERING MANAGER

ENGR.	J.BUJTOR
DRWN.	T.CHIPPI
CHKD.	M.ZUCCARO

BUSWAY CONNECTION
For Transformer Secondary

City of Palo Alto
California
UTILITIES, ELECTRIC ENGINEERING

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XX	XX	NTS	SR-XF-E-1020
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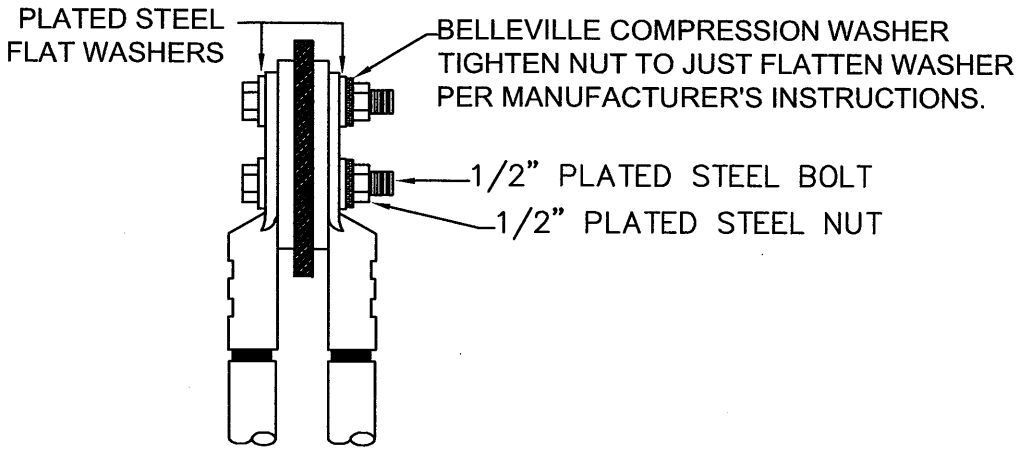


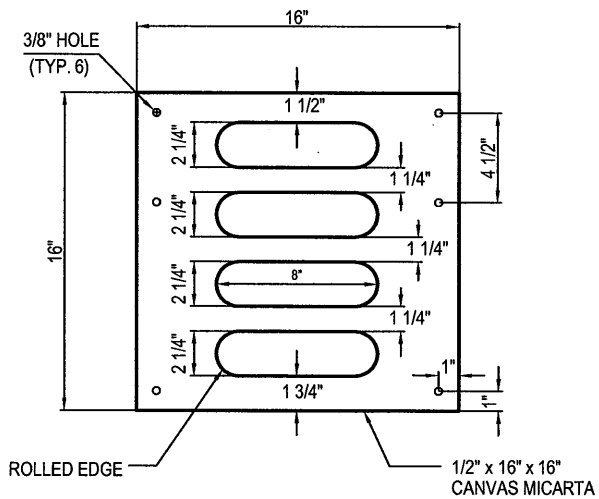
DETAIL 1: SECONDARY CABLE CONNECTION

MATERIALS

COMPRESSION CONNECTORS: USE 535.3 KCMIL CONNECTOR WITH DIE (BURNDY L99) RECOMMENDED BY TOOL MANUFACTURER.

BELLEVILLE SPRING WASHERS: T&B STAINLESS STEEL, 1/2"; #50050BW

CANVAS MICARTA BOARD: RIDOUT PLASTICS, WWW.RIDOUTPLASTICS.COM, 858.560.1551, ANGUS-CAMPBELL, INC. 323.587.1236, OR PORT PLASTICS, 408.571.2231



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APPROVED _____
W. BUJTOR
SR. ENGINEERING MANAGER

Original Signed and Approved by Engineering Manager

ENGR.	J.BUJTOR
DRWN.	T.GRIPPI
CHKD.	M.S.ZUCCARO

BUSWAY CONNECTION
For Transformer Secondary

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