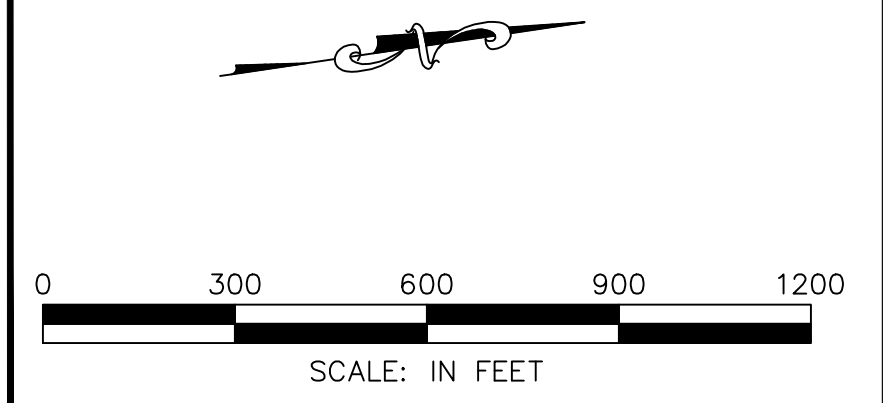
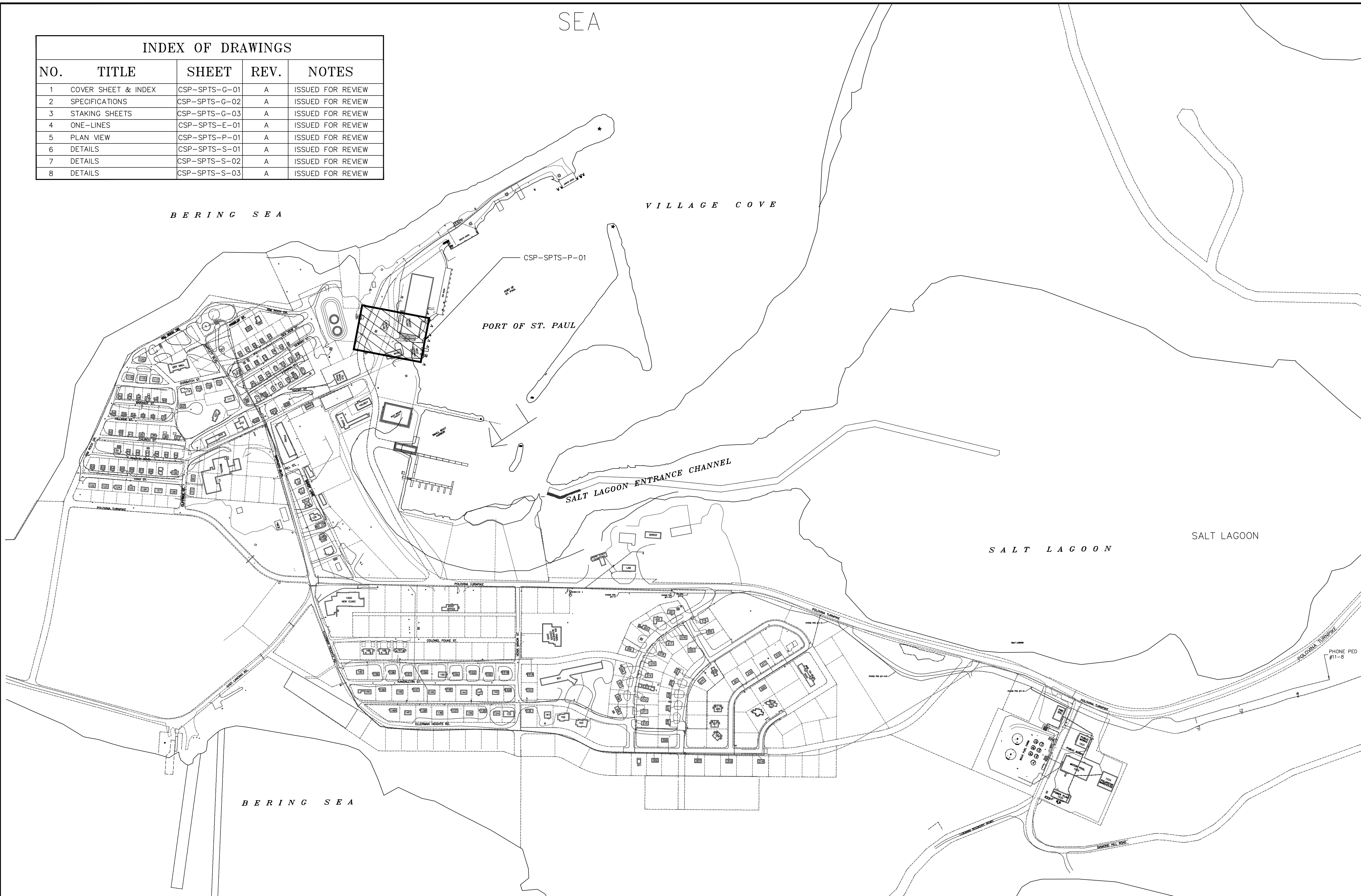


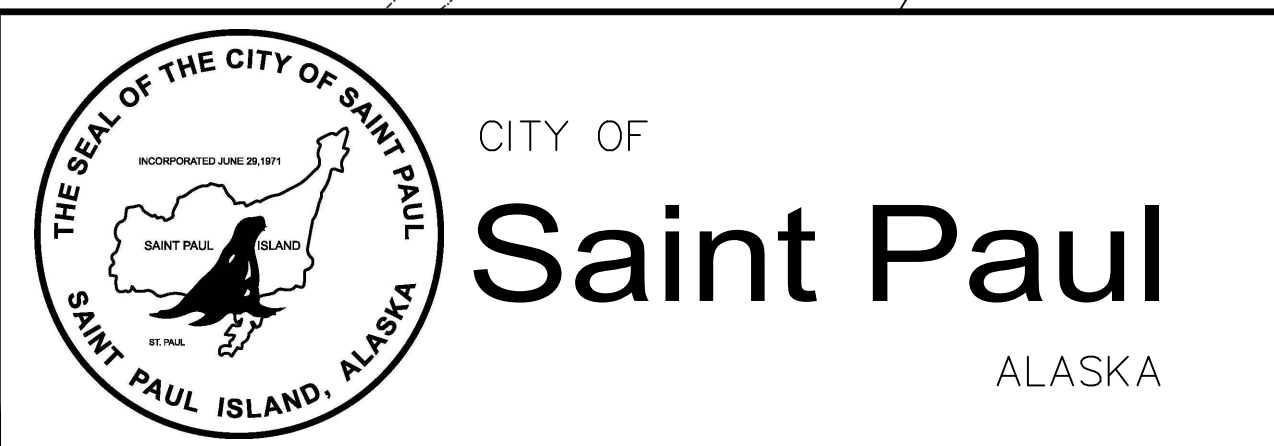
INDEX OF DRAWINGS				
NO.	TITLE	SHEET	REV.	NOTES
1	COVER SHEET & INDEX	CSP-SPTS-G-01	A	ISSUED FOR REVIEW
2	SPECIFICATIONS	CSP-SPTS-G-02	A	ISSUED FOR REVIEW
3	STAKING SHEETS	CSP-SPTS-G-03	A	ISSUED FOR REVIEW
4	ONE-LINES	CSP-SPTS-E-01	A	ISSUED FOR REVIEW
5	PLAN VIEW	CSP-SPTS-P-01	A	ISSUED FOR REVIEW
6	DETAILS	CSP-SPTS-S-01	A	ISSUED FOR REVIEW
7	DETAILS	CSP-SPTS-S-02	A	ISSUED FOR REVIEW
8	DETAILS	CSP-SPTS-S-03	A	ISSUED FOR REVIEW

CONSTRUCTION LEGEND

NEW	EXISTING



PROJECT: CITY OF SAINT PAUL TRIDENT SERVICE			
DESIGNER/PROJECT ENGINEER: CHRISTOPHER T. DAVIS			
		W.O. #: EPS 23-0072	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE
0	ISSUED FOR CONSTRUCTION	MAP/04-24-23	CTD/04-24-2023



DRAWING NAME:	CITY OF SAINT PAUL TRIDENT SERVICE COVERSHEET AND INDEX
REF DWG(S):	
DRAWING NO.:	CSP-SPTS-G-01

DISTRIBUTION SPECIFICATIONS

A. GENERAL

ALL CONSTRUCTION WORK SHALL BE DONE IN A THOROUGH AND WORKMAN-LIKE MANNER IN ACCORDANCE WITH THE STAKING SHEETS, PLANS AND SPECIFICATION, AND CONSTRUCTION DRAWINGS. ALL WORK AREAS SHALL BE LEFT CLEAN OF ANY EXCESS MATERIALS AND GARBAGE.

THE C2-2023 EDITION OF THE NATIONAL ELECTRIC SAFETY CODE SHALL BE FOLLOWED EXCEPT WHERE LOCAL REGULATIONS ARE MORE STRINGENT, IN WHICH CASE LOCAL REGULATIONS SHALL GOVERN. THE DESIGN WAS PERFORMED PER C2-2023 NESC, IF CONSTRUCTION IS DELAYED AND OCCURS UNDER A LATER CODE, THE DESIGN MUST BE REVIEWED FOR THE LATER CODE PRIOR TO CONSTRUCTION.

SOME OF THE DRAWINGS AND SPECIFICATIONS ARE FROM RUS BULLETINS 1728F-804 "SPECIFICATIONS AND DRAWINGS FOR 12.47/7.2 KV CONSTRUCTION" AND 1728F-803 "SPECIFICATIONS AND DRAWINGS FOR 24.9/14/4KV CONSTRUCTION" AND 1728F-806 "SPECIFICATIONS AND DRAWINGS FOR UNDERGROUND ELECTRIC DISTRIBUTION CONSTRUCTION".

B. OVERHEAD SPECIFICATIONS: NOT USED

C. UNDERGROUND SPECIFICATIONS

1. STORAGE OF MATERIAL AND EQUIPMENT:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MATERIAL AND EQUIPMENT TO BE USED IN CONSTRUCTION MUST BE STORED SO AS TO BE PROTECTED FROM DETERIORATING EFFECTS OF THE ELEMENTS. IF OUTDOOR STORAGE CANNOT BE AVOIDED, THE MATERIAL AND EQUIPMENT MUST BE STACKED ON SUPPORTS WELL ABOVE THE GROUND LINE AND PROTECTED FROM THE ELEMENTS AS APPROPRIATE, AND WITH DUE REGARD TO PUBLIC SAFETY.

2. TRENCHING

ALL EXCAVATIONS SHALL BE IN COMPLIANCE WITH FEDERAL AND STATE OSHA REQUIREMENTS.

TRENCH DEPTH SHALL BE PER THE TRENCH DETAIL DRAWING. MINIMUM BURIAL DEPTH FOR PRIMARY SHALL BE 48"; FOR SECONDARY AND STREETLIGHTING MINIMUM BURIAL DEPTH SHALL BE 30" EXCEPT BENEATH ROADWAYS, WHERE 48" SHALL APPLY. THESE DEPTHS MAY BE REDUCED IF CONCRETE ENCASEMENT OR OTHER SUPPLEMENTAL PROTECTION IS PROVIDED. THE BOTTOM OF TRENCH SHALL BE FREE OF ANY SHARP ROCKS OR MATERIAL THAT MAY CAUSE DAMAGE TO CABLES. AT NO POINT SHALL THE CABLES SUSPEND OVER A HOLE OR GAP IN THE TRENCH, SUCH VOIDS SHALL BE FILLED WITH APPROPRIATE MATERIAL.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL TRENCHING DEPTHS SPECIFIED IS MINIMUM AS MEASURED FROM THE FINAL GRADE TO THE TOP SURFACE OF THE CABLE. THE ROUTING MUST BE AS SHOWN ON THE STAKING SHEETS AND PLANS AND SPECIFICATIONS UNLESS CONDITIONS ENCOUNTERED ARE SUCH THAT CHANGES ARE NECESSARY TO ACCOMPLISH THE WORK. TRENCHING IN ROCK MAY BE ENCOUNTERED, IF THE TRENCH ALIGNMENT IS TO BE ALTERED FROM THE PROPOSED TRENCH ALIGNMENT THE OWNER SHALL BE NOTIFIED TO MAKE A DECISION ON WHAT COURSE OF ACTION WILL BE TAKEN. THE TRENCH WIDTHS SPECIFIED IS MINIMUM AND SHOULD BE INCREASED AS NECESSARY TO OBTAIN THE REQUIRED DEPTHS

IN LOOSE SOILS.

CARE SHALL BE EXERCISED TO MINIMIZE THE LIKELIHOOD OF WATER FLOW SINCE THIS MAY CAUSE TRENCH DAMAGE AND REDUCTION IN TRENCH DEPTH. IF THIS OCCURS, THE TRENCH MUST BE CLEARED TO THE SPECIFIED DEPTH BEFORE INSTALLING THE CABLE.

CONSTRUCTION SHALL BE ARRANGED SO THAT TRENCHES MAY BE LEFT OPEN FOR THE SHORTEST PRACTICAL TIME TO AVOID CREATING A HAZARD TO THE PUBLIC AND TO MINIMIZE THE LIKELIHOOD OF COLLAPSE OF THE TRENCH DUE TO OTHER CONSTRUCTION ACTIVITY, RAIN, ACCUMULATION OF WATER IN THE TRENCH, ETC.

3. BACKFILLING:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE FIRST 6 INCHES OF TRENCH BACKFILL SHALL BE FREE FROM ROCK, GRAVEL OR OTHER MATERIAL WHICH MIGHT DAMAGE THE CABLE JACKET. IN LIEU OF CLEANING THE TRENCH, THE CONTRACTOR MAY, AT THE CONTRACTOR'S OPTION, PLACE A 2 INCH BED OF CLEAN SAND OR SOIL UNDER THE CABLE AND 4 INCHES OF CLEAN SOIL ABOVE THE CABLE. CLEANED SOIL BACKFILL WHEN USED SHALL CONTAIN NO SOLID MATERIAL LARGER THAN 1 INCH AND BE NON-FROST SUSCEPTIBLE. THIS SOIL LAYER MUST BE CAREFULLY COMPACTED SO THAT THE CABLE WILL NOT BE DAMAGED.

BACKFILLING MUST BE COMPLETED IN SUCH A MANNER THAT VOIDS WILL BE ELIMINATED. EXCESS SOIL MUST BE PILED ON TOP AND MUST BE WELL TAMPED. ALL ROCK AND DEBRIS MUST BE REMOVED FROM THE SITE, AND ANY DAMAGE TO THE PREMISES REPAIRED IMMEDIATELY.

PIECES OF SCRAP CABLE OR OTHER MATERIAL REMAINING AFTER INSTALLATION MUST NOT BE BURIED IN THE TRENCH AS A MEANS OF DISPOSAL.

BACKFILLED MATERIAL SHALL BE COMPACTED FOR ALL ROAD CROSSINGS, LANDSCAPED AREAS, AND WHERE SPECIFIED.

4. CONDUIT:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL EXPOSED ENDS OF CONDUIT MUST BE PLUGGED DURING CONSTRUCTION TO PREVENT THE ENTRANCE OF FOREIGN MATTER AND MOISTURE INTO THE CONDUIT. BURRS OR SHARP PROJECTIONS WHICH MIGHT INJURE THE CABLE MUST BE REMOVED. RISER SHIELD OR CONDUIT MUST EXTEND AT LEAST 18 INCHES BELOW GRADE AT ALL RISER POLES. IF FULL ROUND CONDUIT IS USED AS A RISER SHIELD, A BUSHING MUST BE INSTALLED ON THE LOWER END TO PREVENT DAMAGE TO THE CABLE.

5. UNDERGROUND CABLE:

A. HANDLING OF CABLE:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE CABLE SHALL BE HANDLED CAREFULLY AT ALL TIMES TO AVOID DAMAGE, AND SHALL NOT BE DRAGGED ACROSS THE GROUND, FENCES OR SHARP PROJECTIONS. CARE SHALL BE EXERCISED TO AVOID EXCESSIVE BENDING OF THE CABLE. THE CONTRACTOR SHALL ENSURE THAT THE ENDS OF THE CABLE BE SEALED AT ALL TIMES AGAINST MOISTURE WITH SUITABLE END CAPS. WHERE IT IS NECESSARY TO CUT THE CABLE, THE ENDS WILL BE TERMINATED OR SEALED IMMEDIATELY AFTER THE CUTTING

OPERATION.

B. MINIMUM BENDING RADIUS OF CABLE:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE MINIMUM BENDING RADIUS OF PRIMARY CABLE IS 12 TIMES THE OVERALL DIAMETER OF THE CABLE OR PER MANUFACTURER'S RECOMMENDATIONS, WHICH EVER IS LARGER. THE MINIMUM BENDING RADIUS OF SECONDARY AND SERVICE CABLE IS SIX TIMES THE OVERALL DIAMETER OF THE CABLE. IN ALL CASES THE MINIMUM RADIUS SPECIFIED IS MEASURED TO THE SURFACE OF THE CABLE ON THE INSIDE OF THE BEND. CABLE BENDS MUST NOT BE MADE WITHIN 6 INCHES OF A CABLE TERMINAL BASE.

C. INSTALLATION IN CONDUIT OR DUCT:

WHERE CABLE MUST BE PULLED THROUGH CONDUIT OR DUCT, THE OPERATION SHALL BE PERFORMED IN SUCH A WAY THAT THE CABLE WILL NOT BE DAMAGED FROM STRAIN OR DRAGGING. THE CABLE SHALL BE LUBRICATED WITH A SUITABLE CABLE LUBRICANT PRIOR TO PULLING INTO CONDUIT OR DUCT.

IN PLACING PRIMARY CABLES, THE STRESS APPLIED WHILE PULLING INTO DUCTS OR DURING OTHER PULLING OPERATIONS SHALL NOT EXCEED THE LEAST OF THE FOLLOWING:

I. WHERE A PULLING EYE IS ATTACHED TO THE CONDUCTOR, THE MAXIMUM PULLING STRAIN IN POUNDS SHALL NOT EXCEED .006 TIMES THE CIRCULAR MIL AREA FOR ALUMINUM OR .008 TIMES THE CIRCULAR MIL AREA FOR COPPER.

II. WHERE A BASKET GRIP IS PLACED OVER THE CABLE, THE PULLING STRAIN SHALL NOT EXCEED THE LESSER OF: (1) THAT CALCULATED IN ABOVE; OR (2) 1000 POUNDS. THE CABLE UNDER THE CABLE GRIP AND 1.0 FOOT PRECEDING IT SHALL BE SEVERED AND DISCARDED AFTER THE PULLING OPERATION.

III. PULLING TENSION SHALL BE MONITORED AT ALL TIMES.

IV. IN NO CASE SHALL THE MAXIMUM PULLING TENSION EXCEED THAT RECOMMENDED BY THE SPECIFIC CABLE MANUFACTURER.

V. AT BENDS THE MAXIMUM SIDEWALL PRESSURE RECOMMENDED BY THE CABLE MANUFACTURER SHALL NOT BE EXCEEDED.

D. TAGGING OF CABLES AT TERMINATION POINTS:

CABLES SHALL BE TAGGED AND IDENTIFIED AT ALL ACCESSIBLE LOCATIONS AS THE CABLES ARE LAID. THE IDENTIFICATION MUST BE OF A PERMANENT TYPE, SUCH AS THAT DONE ON PLASTIC OR CORROSION RESISTANT METAL TAGS. THE TAG MUST BE SECURELY ATTACHED TO THE CABLE. PAPER OR CLOTH TAGS ARE NOT ACCEPTABLE.

E. SPLICES:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT CABLE SPLICES MUST BE OF THE PREMOLDED RUBBER, HEAT-SHRINK, OR COLD-SHRINK TYPE, OF THE CORRECT VOLTAGE RATING AND MUST BE INSTALLED IN ACCORDANCE WITH THE SPLICE MANUFACTURER'S INSTRUCTIONS. SPLICES THAT DEPEND SOLELY ON TAPE FOR A MOISTURE BARRIER MUST NOT BE USED.

NOT MORE THAN ONE SPLICE MAY BE PERMITTED FOR EACH 2000 FEET OF CABLE INSTALLED UNLESS AUTHORIZED BY THE OWNER. NO BENDS MAY BE PERMITTED WITHIN 12 INCHES OF THE ENDS OF A SPLICE. THE CABLE OR CIRCUIT NUMBERS AND THE EXACT

LOCATION OF ALL SPLICES MUST BE NOTED ON THE STAKING SHEETS (AS BUILT).

F. PRIMARY CABLE TERMINATION AND STRESS CONES:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT PREFABRICATED STRESS CONES OR TERMINATIONS MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AT ALL PRIMARY CABLE TERMINALS. THEY MUST BE SUITABLE FOR THE SIZE AND TYPE OF CABLE THAT THEY ARE USED WITH AND FOR THE ENVIRONMENT IN WHICH THEY WILL OPERATE. ANY INDICATION OF MISFIT, SUCH AS A LOOSE OR EXCEPTIONALLY TIGHT FIT, MUST BE CALLED TO THE OWNER'S ATTENTION. THE OUTER CONDUCTIVE SURFACE OF THE TERMINATION MUST BE BONDED TO THE SYSTEM NEUTRAL. A HEAT-SHRINK OR COLD-SHRINK SLEEVE MUST BE INSTALLED TO SEAL BETWEEN THE BODY OF THE TERMINATION AND THE CABLE JACKET.

G. SPECIAL PRECAUTIONS FOR CABLE SPLICES AND TERMINATIONS:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A PORTABLE COVERING OR SHELTER MUST BE AVAILABLE FOR USE WHEN SPLICES OR TERMINATIONS ARE BEING PREPARED AND WHEN PREFABRICATED TERMINATIONS ARE BEING SWITCHED. THE SHELTER MUST BE USED AS NECESSARY TO KEEP RAIN, SNOW AND WINDBLOWN DUST OFF THE INSULATING SURFACES OF THESE DEVICES. SINCE CLEANLINESS IS ESSENTIAL IN THE PREPARATION AND INSTALLATION OF PRIMARY CABLE FITTINGS, CARE SHALL BE EXERCISED TO PREVENT THE TRANSFER OF CONDUCTING PARTICLES FROM THE HANDS TO INSULATING SURFACES. MATING SURFACES MUST BE WIPED WITH A SOLVENT SUCH AS DENATURED ALCOHOL TO REMOVE ANY POSSIBLE ACCUMULATION OF DIRT, MOISTURE OR OTHER CONDUCTING MATERIALS. A SILICONE GREASE OR SIMILAR LUBRICANT SHOULD BE APPLIED AFTERWARDS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHENEVER PREFABRICATED CABLE DEVICES ARE OPENED, THE UNENERGIZED MATING SURFACES MUST BE LUBRICATED WITH SILICONE GREASE BEFORE THE FITTINGS ARE RECONNECTED.

6. GROUNDING:

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL NEUTRAL CONDUCTORS, GROUNDING ELECTRODES, AND GROUNDABLE PARTS OF EQUIPMENT SHALL BE INTERCONNECTED. ALL INTERCONNECTIONS SHALL BE MADE AS SHOWN ON THE CONSTRUCTION DRAWINGS. A COPPER-CLAD OR GALVANIZED STEEL GROUND ROD WITH MINIMUM LENGTH OF 8 FEET SHALL BE INSTALLED AT ALL EQUIPMENT LOCATIONS AS SHOWN IN THE CONSTRUCTION DRAWINGS AND AT ALL CABLE SPLICES AND TAPS.

ALL PAD-MOUNTED EQUIPMENT ENCLOSURES, INCLUDING TRANSFORMERS, SHALL BE GROUNDED IN SUCH A MANNER THAT TWO SEPARATE GROUNDING PATHS EXIST BETWEEN THE ENCLOSURE AND THE GROUNDING ROD(S).

D. TESTING SPECIFICATIONS

1. MEDIUM-VOLTAGE CABLE TEST(S)

A. PERFORM A SHIELD CONTINUITY TEST ON EACH POWER CABLE BY OHMMETER METHOD. RECORD OHMIC VALUE, RESISTANCE VALUES IN EXCESS OF 10 OHMS PER 1000 FEET OF CABLE MUST BE INVESTIGATED AND JUSTIFIED.

PROJECT: CITY OF SAINT PAUL TRIDENT SERVICE				
DESIGNER/PROJECT ENGINEER: CHRISTOPHER T. DAVIS				
				W.O. #: EPS 23-0072
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DRAWING NAME:	CITY OF SAINT PAUL TRIDENT SERVICE SPECIFICATIONS
REF DWG(S):	
DRAWING NO.:	CSP-SPTS-G-02
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	SHEET 2 OF 8

STATUS	STRUCTURE NUMBER	GRID NUMBER	SHEET NUMBER	BACK SPAN	LINE ANGLE	PRIMARY					GUY			ANCHOR		SECONDARY AND SERVICE			MISCELLANEOUS		METER	REMARKS			
						CONDUCTOR		POLE or TRENCH	POLE TOP/ UG		TRANSFORMER UNIT	GROUND UNIT	NO.	UNIT	LEAD (ft)	NO.	UNIT	NO.	UNIT	WIRE SIZE			NO.	UNIT	
						NO.	TYPE		NO.	UNIT															
E	D1			340		3	#2/0 CONC 15 NJ		1	UM33X-3															
E	SC HAR 4			340		1	UM50-P-4		1	UM1-1B															
E	R1A1			148		3	#2/0 CONC 15 NJ		1	UM33X-3								6	UM6-1-H						
R	SC HAR 3																	3	UM6-10						Retire insulated protective cap
I				0		3	#1/0 CONC 15											3	UM6-1-A						
I																		3	UM2.2GX						Cable tags for all new conductors
E	R1A1-2A			108		1	UM50-P-4																		
I	X HAR 6			15		1	UM50-P-4	UR2	1	UM1-1B	UG17-2-750-B	UM6-6						3	UM6-1-A						
I				138		3	#1/0 CONC 15											1	UM2.2GX						
I																		4	FBR490SS						
I																		4	M-BOL						Bollards to protect transformer from vehicle traffic
E	TRIDENT																								
I	SC HAR 3			20		3	UM50-S-4	URC-DB										1	SS-14-4-B						CT Cabinet
I				35													4	350 MCM CU XHHW	2	FBR490SS					
I																		1	UM2.2GX						
I				35													4	350 MCM CU XHHW	2	FBR490SS					
I																		1	UM2.2GX						
I				35													4	350 MCM CU XHHW	2	FBR490SS					
I																		1	UM2.2GX						
I	TRIDENT CONNECTION			50		3	UM50-S-4	URC-DB																	Trident Service cable tray intercept
I				80													4	350 MCM CU XHHW	4	FBR490SS					
I																		1	UM2.2GX						
I				80													4	350 MCM CU XHHW	4	FBR490SS					
I																		1	UM2.2GX						
I				80													4	350 MCM CU XHHW	4	FBR490SS					
I																		1	UM2.2GX						

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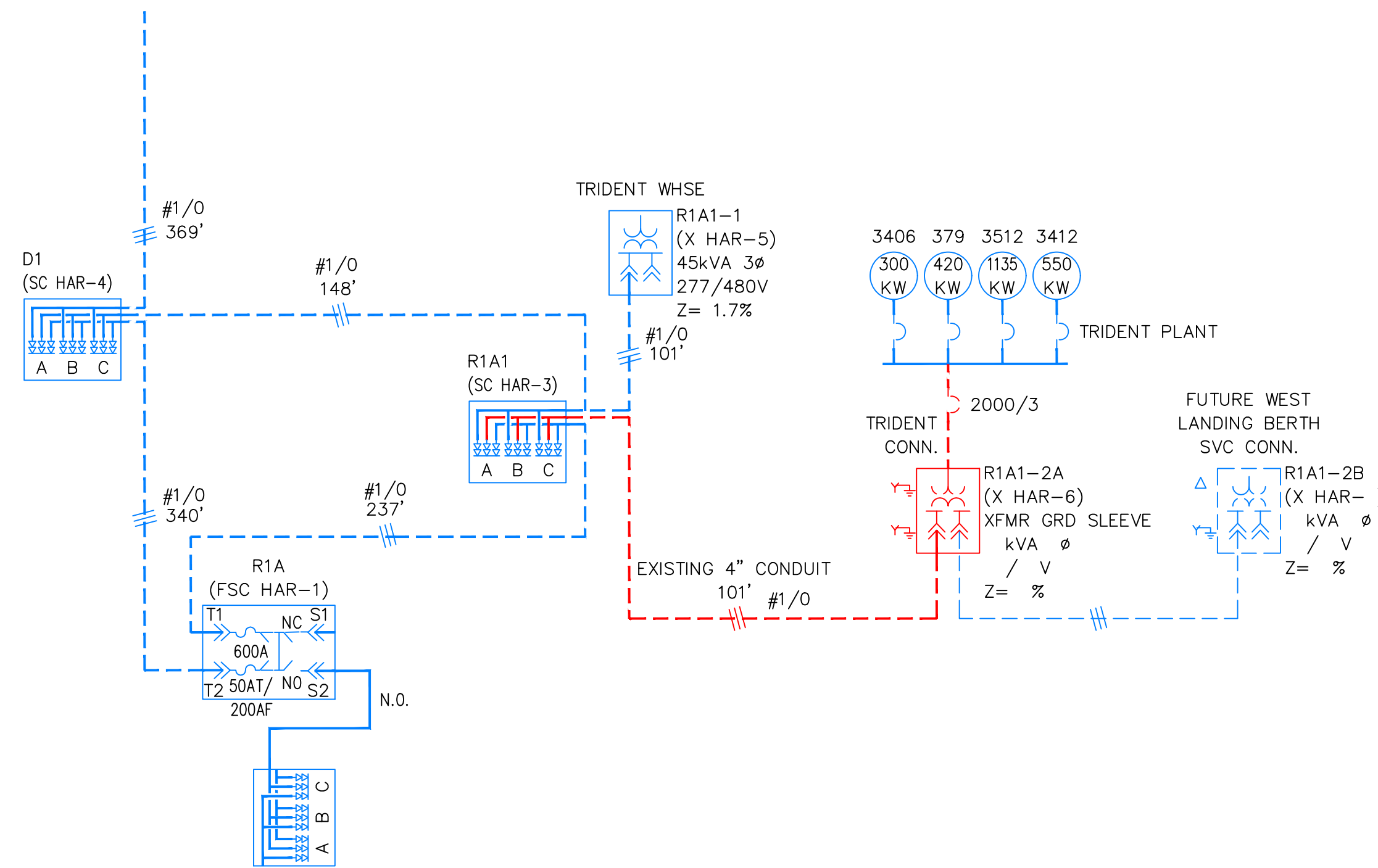


DRAWING NAME:	CITY OF SAINT PAUL TRIDENT SERVICE STAKINGSHEET	
REF DWG(S):		
DRAWING NO.:	CSP-SPTS-G-03	SHEET 3 OF 8

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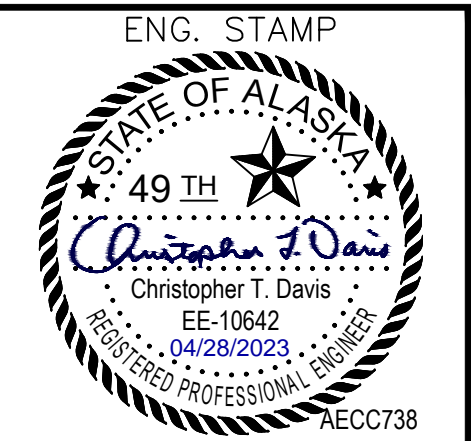
NOTES:

- UNLESS OTHERWISE NOTED, PRIMARY CONDUCTOR IS 15kV RATED, STRAND FILLED #1/0 ALUMINUM, TREE RESISTANT, CROSS LINKED POLYETHYLENE JACKETED CONCENTRIC FULL NEUTRAL.
- UNLESS OTHERWISE NOTED, ALL THREE PHASE TRANSFORMERS ARE: $Y_{\frac{1}{2}} Y_{\frac{1}{2}}$
- UNLESS OTHERWISE NOTED, AT ALL SINGLE PHASE TRANSFORMERS, ALL PHASES ARE TERMINATED WITH LOAD BREAK ELBOWS (LOOP FEED TO TRANSFORMER OR 2-PT JUNCTION).

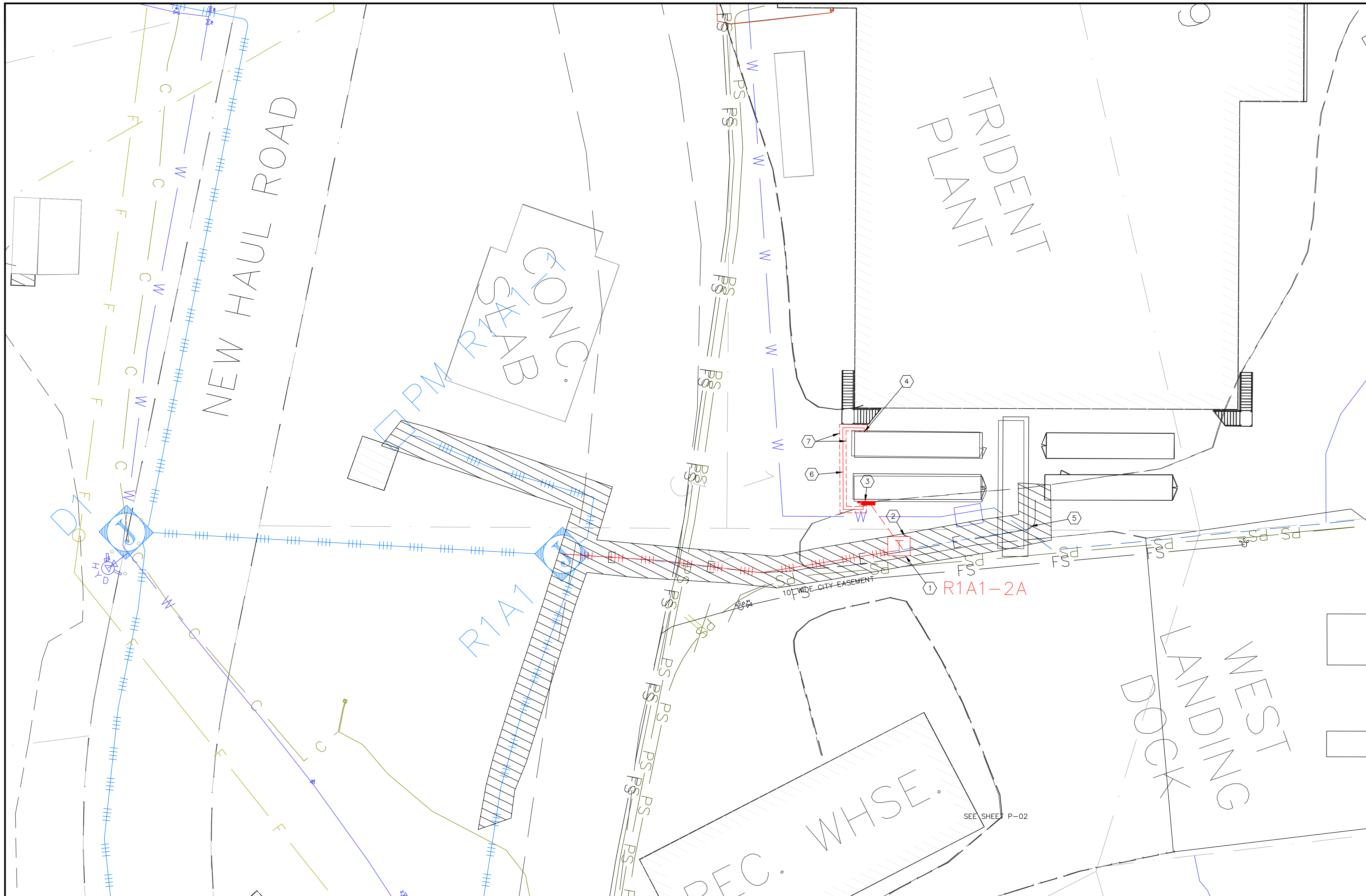


LEGEND	
	PULL BOX
	NODE DESIGNATION
	FAULT INDICATOR
	SWITCH
	FUSE
	LOAD BREAK ELBOW CONNECTION
	NORMALLY CLOSED SWITCH
	NORMALLY OPEN SWITCH
	NUMBER OF PRIMARY CONDUCTORS
	EXISTING PRIMARY LINE, DIRECT BURIAL
	EXISTING PRIMARY IN 4" PVC CONDUIT
	INSTALL PRIMARY LINE, DIRECT BURIAL
	INSTALL PRIMARY IN 4" PVC CONDUIT
	RETIRE PRIMARY LINE, DIRECT BURIAL
	RETIRE PRIMARY IN 4" PVC CONDUIT
	UNIT ELECTRIC UTILITY NUMBER (CITY ASSET MGMT SYSTEM NUMBER)
	FUTURE PRIMARY LINE EXTENSION
	TRANSFORMER
	SWITCHING CABINET
	EXISTING SECTIONALIZING CABINET WITH 3 PT JUNCTIONS
	SECTIONALIZING CABINET UNDER CONSTRUCTION WITH 4 PT JUNCTIONS
	FUTURE SECTIONALIZING CABINET
	GENERATOR
	BREAKER

PROJECT: CITY OF SAINT PAUL TRIDENT SERVICE		W.O. #: EPS 23-0072	
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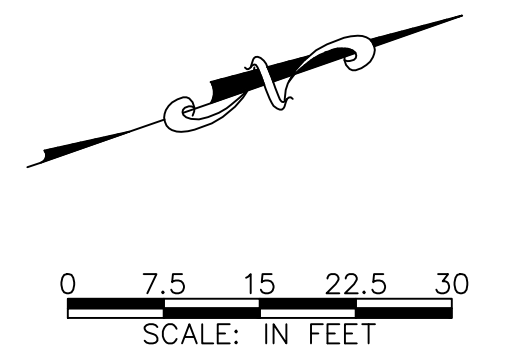


DRAWING NAME:	CITY OF SAINT PAUL TRIDENT SERVICE ONELINE
REF DWG(S):	cps_spts_plan_view.dwg
DRAWING NO.:	CPS-SPTS-E-01
SHEET	4 OF 8



CONSTRUCTION LEGEND			
NEW	EXISTING		
	PADMOUNT TRANSFORMER		PEDESTAL
	POWER POLE		WARNING POST
	1φ U.G. PRI. CONDUCTOR		1φ O.H. CONDUCTOR
	3φ U.G. PRI. CONDUCTOR		3φ O.H. CONDUCTOR
	U.G. SECONDARY CONDUCT.		JUNCTION BOX
	1φ O.H. CONDUCTOR		COMMUNICATIONS VAULT
	3φ O.H. CONDUCTOR		SPARE CONDUIT
	JUNCTION BOX		PADMOUNT PRIMARY METER
	COMMUNICATIONS VAULT		SWITCH CABINET
	SPARE CONDUIT		VAULT
	PADMOUNT PRIMARY METER		
	SWITCH CABINET		
	VAULT		

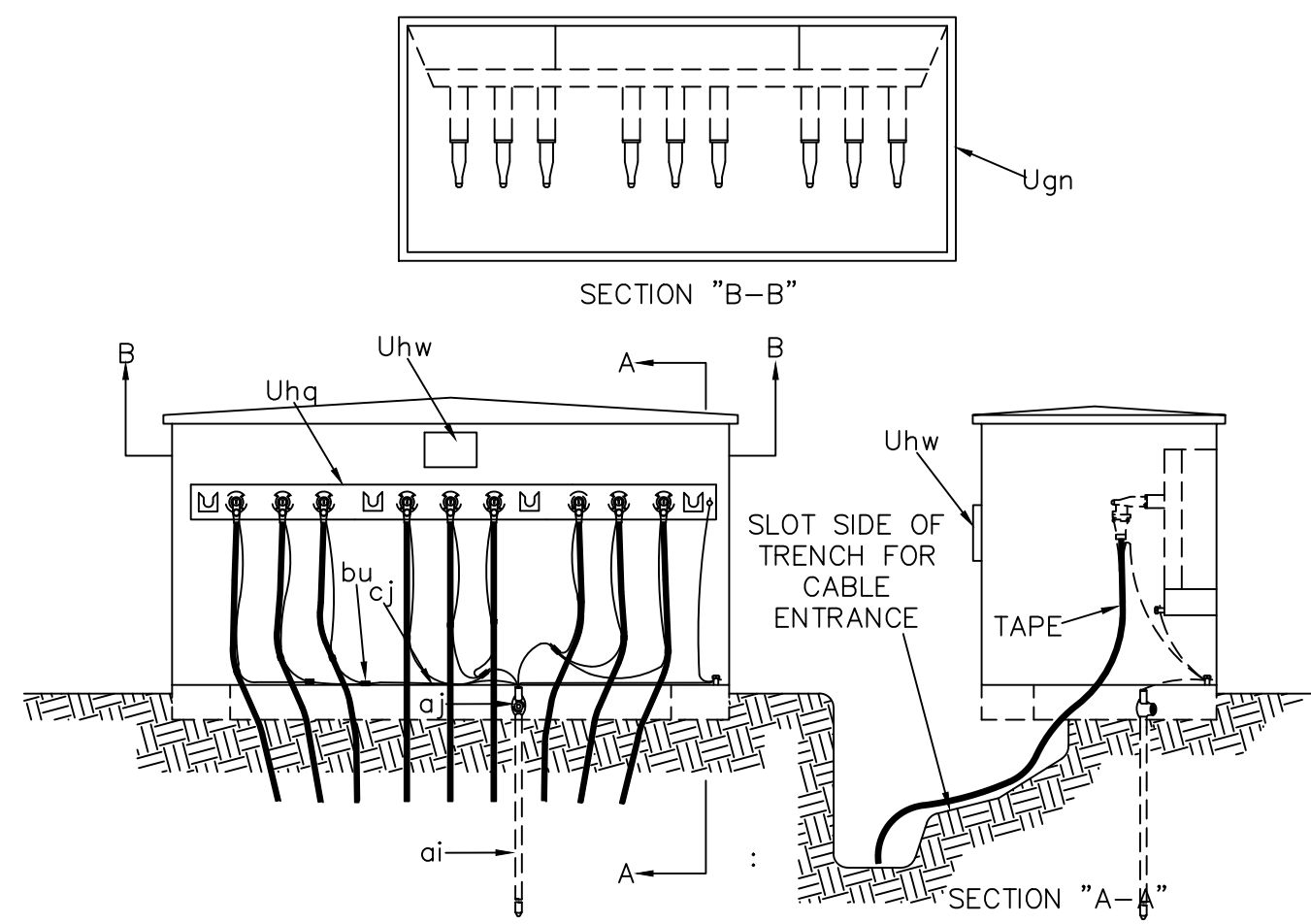
- NOTES:
- INTERCEPT EXISTING 4" CONDUIT AND EXTEND INTO NEW TRANSFORMER FOUNDATION.
 - PLACE TRANSFORMER 3.0 FEET MINIMUM FROM CONNEX WALL.
 - INSTALL CT CABINET AND METER BASE.
 - INTERCEPT EXISTING CABLE TRAY, COORDINATE WITH TRIDENT FOR CONNECTION TO EXISTING 1200A BREAKER.
 - ABANDON UNUSED CONDUIT.
 - CONTRACTORS OPTION STANDARD BURY PER UR2 OR SHALLOW BURY UR-DB NOT LESS THAN 4" OF RED CONCRETE ENCASING.
 - TRENCH LIMITS: DEPTH NOT LESS THAN 9" AND WIDTH NOT LESS THAN 28". TRENCH LIMITS 3.0 FEET MINIMUM FROM CONNEX WALL.



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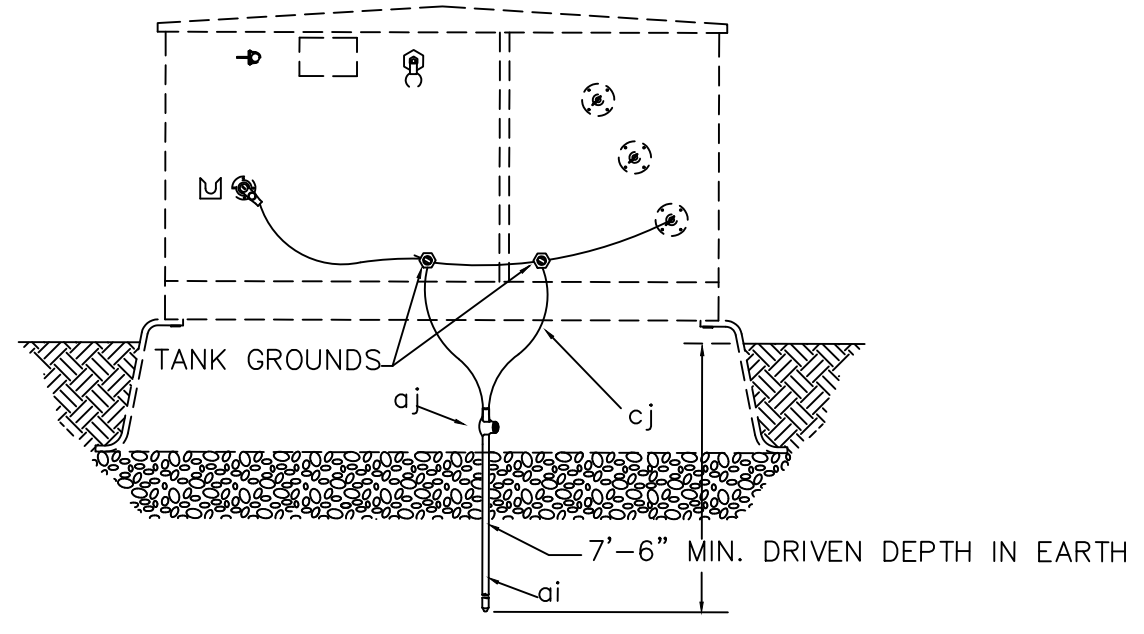
DRAWING NAME:	CITY OF SAINT PAUL TRIDENT SERVICE PLAN VIEW
REF DWG(S):	
DRAWING NO.:	CSP-SPTS-P-01
	cps_spts_plan_view.dwg
	SHEET 5 OF 8



RUS	QTY	QTY	MATERIAL
c	6	6	BOLT, MACHINE, 1/2" X REQ'D LENGTH
d	6	6	WASHERS, RD, 9/16" HOLE
p			CONNECTORS, AS REQUIRED
ai	1	1	ROD, GROUND, 3/4" X 8'-0", GS
aj	2	2	CLAMP, GROUND ROD
av			JUMPERS, #4 BACUSTR, AS REQ'D
bu	2	2	CONNECTOR, GROUND, AS REQUIRED
cj			GROUND WIRE, #2 BACUSTR, AS REQ'D
Ugn	1	1	ENCLOSURE, PAD MOUNTED
Uhv	2	2	DECAL, "DANGER" AND "WARNING"
Uhq	3	3	TERMINATIONS, MULTIPPOINT, 3-WAY
Uhq	3	3	TERMINATIONS, MULTIPPOINT, 4-WAY
	6	6	ANCHORS, CONCRETE, 1/2"
	1	1	EQUIPMENT LOCK, TAMPERPROOF
			TAPE, AS REQUIRED

- NOTES:
- DESIGNATE VUM33X-# FOR 14.4/24.9k. DESIGNATE (V)UM33X-3 FOR 3-WAY, AND (V)UM33X-4 FOR 4-WAY.
 - THE FOLLOWING UNITS/ASSEMBLIES ARE NOT PART OF THIS UNIT. SPECIFY SEPARATELY: INSULATED PARKING BUSHINGS, LOADBREAK ELBOWS, AND PAD.
 - PROVIDE SUFFICIENT PRIMARY NEUTRAL PIGTAIL AND CABLE SLACK TO PERMIT READY DISCONNECTION OF ELBOW AND MOUNTING ON PARKING STAND. TRAIN CABLES AS SHOWN.
 - TAG ALL CABLES PER GUIDE UM2.2GX.
 - ALL NEUTRALS AND METALLIC NON-CURRENT CARRYING PARTS SHALL BE INTERCONNECTED AND GROUNDED. PROVIDE A FULL LOOP OF #2 AWG TO THE GROUND ROD.
 - INSTALL "WARNING" SIGN ON OUTSIDE SURFACE OF ENCLOSURE AND "DANGER" SIGN INSIDE ENCLOSURE. OUTSIDE OF ENCLOSURE PER GUIDE UM2.1GX.
 - PROVIDE A FULL LOOP OF CABLE INSIDE PAD.

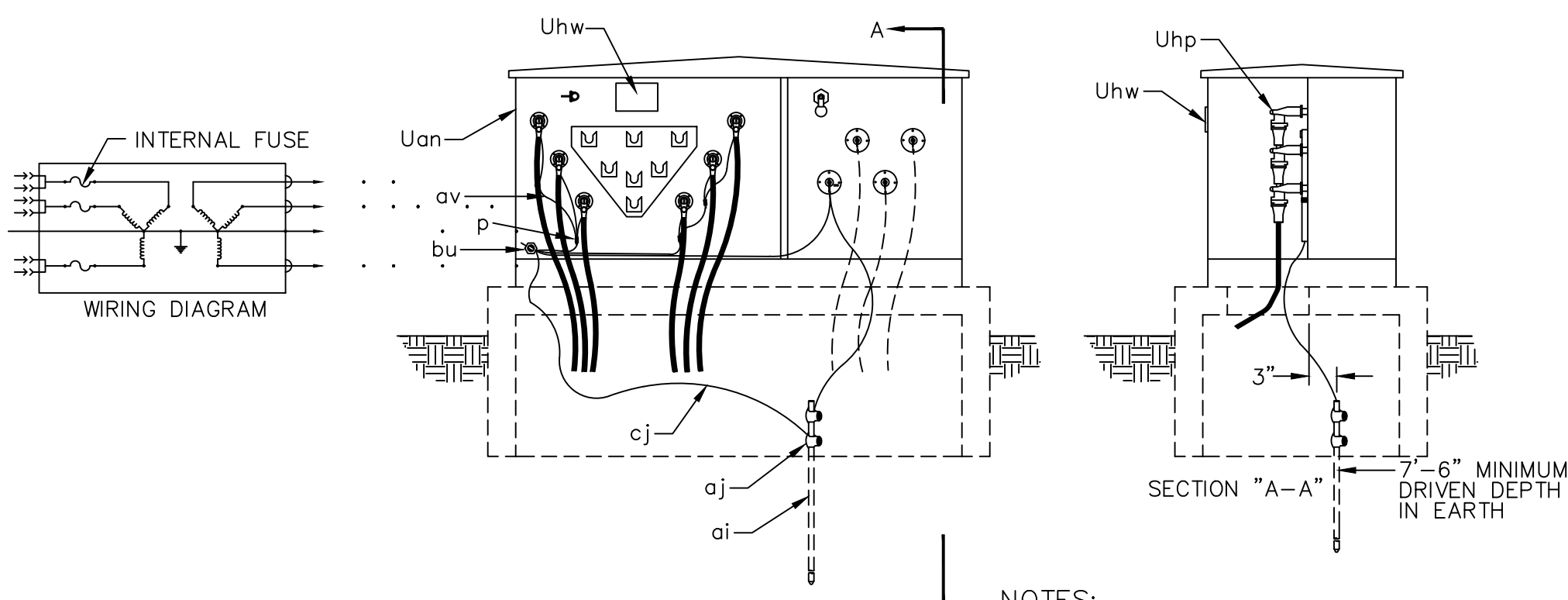
UM33-X, THREE PHASE SECTIONALIZING ENCLOSURE PAD MOUNTED



ITEM	QTY	MATERIAL
p		CONNECTOR, AS REQUIRED
ai	1	ROD, GROUND
aj		CLAMP, GROUND ROD
cj		WIRE, GROUND, AS REQUIRED

- NOTES:
- TIE CONCENTRIC NEUTRALS TOGETHER BEFORE TAP TO GROUND LOOP OR SIZE GROUND LOOP LARGE ENOUGH TO ASSURE SAME CONDUCTIVITY AS CABLE NEUTRAL.

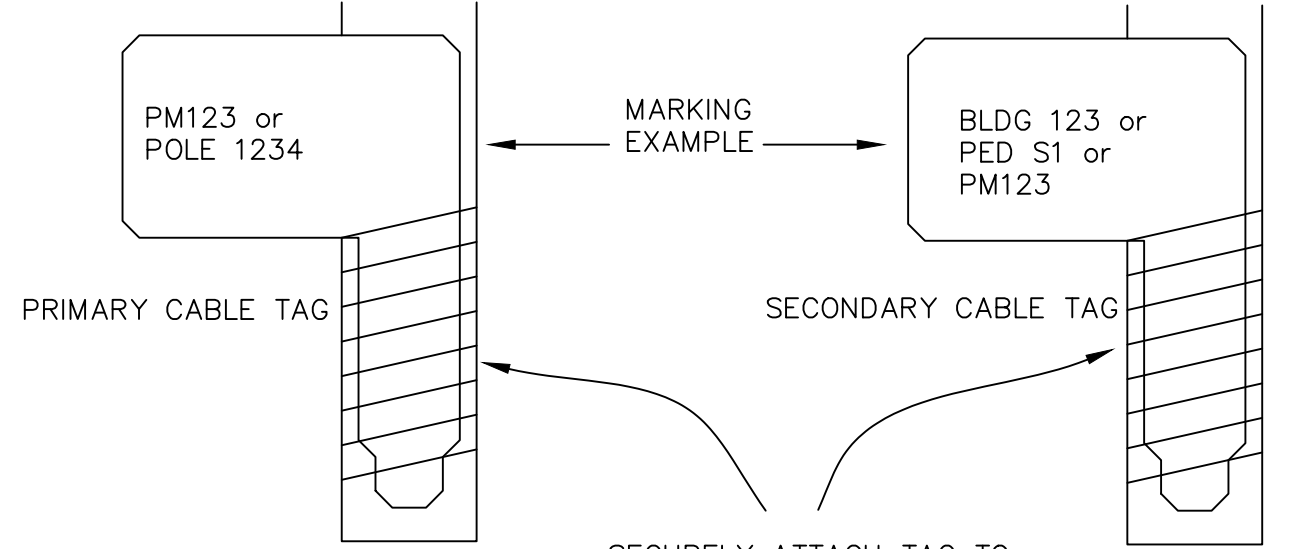
UM6-6, GROUNDING ASSEMBLY FOR PADMOUNTED TRANSFORMERS AND ENCLOSURES (1 ROD)



RUS	QUANTITY	MATERIAL
UG17-2	4	BOLT, MACHINE, 1/2" X REQ'D LENGTH
UG17-3	4	CONNECTOR, COMPRESSION, AS REQ'D
ai	1	ROD, GROUND, 3/4" X 8'-0", GS
aj	2	CLAMP, GROUND ROD
av		JUMPERS, #4 AWG BACUSTR, AS REQ'D
bu	2	CONNECTOR, EQUIPMENT GROUND
cj		GROUND WIRE, #2 AWG BACUSTR, AS REQ'D
Uan	1	TRANSFORMER, PAD MOUNTED, THREE PHASE, LOOP FEED
Ufz	3	CONNECTOR BLOCK, INSULATED, 6-POSITION
Ugq	3	SLEEVE, INSULATED (FOR 500 KVA 120/208 AND LARGER TRANSFORMERS WITH SPADE TERMINALS)
	1	CONNECTOR BLOCK, NEUTRAL, 6-POSITION
Uhb	3	INSULATING CAP
Uhp	6	TERMINATION, ELBOW, LOAD BREAK
Uhw	2	DECALS, "WARNING" AND "DANGER"
	4	ANCHORS, CONCRETE, 1/2"
AR	AR	CABLE TAGS, AS REQ'D.
	2	CONNECTOR, COMPRESSION, CAL, GROUNDING (2-HOLE, NEMA REQUIRED FOR SPADE TERMINALS)
	1	EQUIPMENT LOCK, TAMPERPROOF

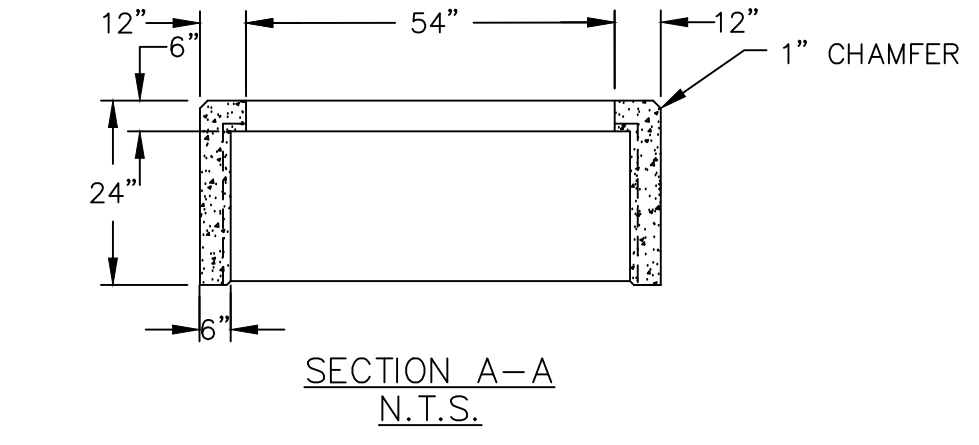
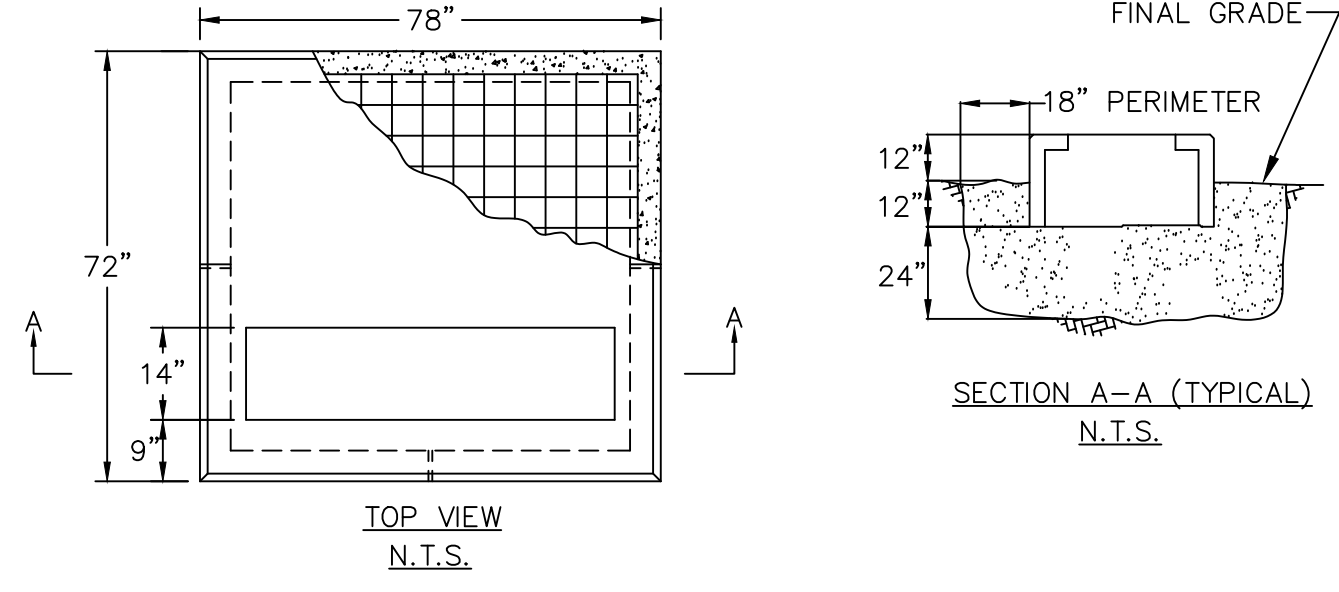
- NOTES:
- ONLY THE WYE-WYE CONNECTION SHOULD BE USED TO AVOID FERRO-RESONANCE.
 - PROVIDE SUFFICIENT PRIMARY NEUTRAL PIGTAIL AND CABLE SLACK TO PERMIT READY DISCONNECTION OF ELBOW AND MOUNTING ON PARKING STAND. TRAIN CABLES AS SHOWN. PROVIDE A FULL LOOP OF CABLE INSIDE PAD.
 - PROVIDE A COMPLETE GROUND LOOP TO GROUND ROD. LOOP AROUND VAULT OPENING. SPECIFY PAD SEPARATELY.
 - INSTALL "DANGER" SIGN INSIDE TRANSFORMER AND "WARNING" SIGN ON OUTSIDE SURFACE OF ENCLOSURE.
 - SPECIFY SIZE THEN SPECIFY SECONDARY VOLTAGE WITH LAST SUFFIX AS FOLLOWS:
A - 208Y/120
B - 480Y/277
C - OTHER (SPECIFY ON DESIGN AND STAKING SHEETS)
(i.e. UG17-2-75-B FOR 75 KVA AT 480Y/277 VOLTS SECONDARY)

THREE PHASE PAD-MOUNTED TRANSFORMER, UG17-2 (LOOP FEED), UG17-3 (RADIAL FEED)



- NOTES:
- THIS UNIT INCLUDES ALL THE TAGS NECESSARY TO TAG THE TERMINATION OF ONE CIRCUIT.
 - LABEL ALL CONDUCTORS WITH COLORED TAPE AS FOLLOWS:
PRIMARY:
A-PHASE - RED
B-PHASE - WHITE
C-PHASE - BLUE
SECONDARY:
208/120: A-BLACK, B-RED, C-BLUE, NEUTRAL-WHITE
480/277: A-BROWN, B-ORANGE, C-YELLOW, NEUTRAL-GRAY.
 - TAG PRIMARY CONDUCTORS WITH RED, WHITE, OR BLUE TAGS (A_φ-RED, B_φ-WHITE, AND C_φ-BLUE). TAG EACH SECONDARY CONDUCTOR (INCLUDING THE NEUTRAL) WITH A YELLOW TAG.
 - ATTACH EACH PRIMARY TAG 4" BELOW THE SEMI-CONDUCTING SURFACE OF THE TERMINATION. ATTACH EACH SECONDARY TAG 12" BELOW THE TERMINATION. ALL TAGS SHALL BE SECURELY TAPED TO THE CONDUCTOR WITH "88" VINYL ELECTRICAL TAPE.
 - THE SOURCE OR LOAD OF THE CIRCUIT SHALL BE PRINTED LEGIBLY ON EACH TAG WITH A PERMANENT BLACK MARKER. ON PRIMARY TAGS THE INSTALLER SHALL ADD THE NAME OF THE PERSON WHO "MADE UP" THE TERMINATION OR SPLICE, THE NAME OF THE CONTRACTOR OR COMPANY, AND THE DATE.
 - FOR PARALLEL CIRCUITS MARK THE TAGS AS BELOW:
PHASE A: A1, A2...An
PHASE B: B1, B2...Bn
PHASE C: C1, C2...Cn
NEUTRAL: N1, N2...Nn

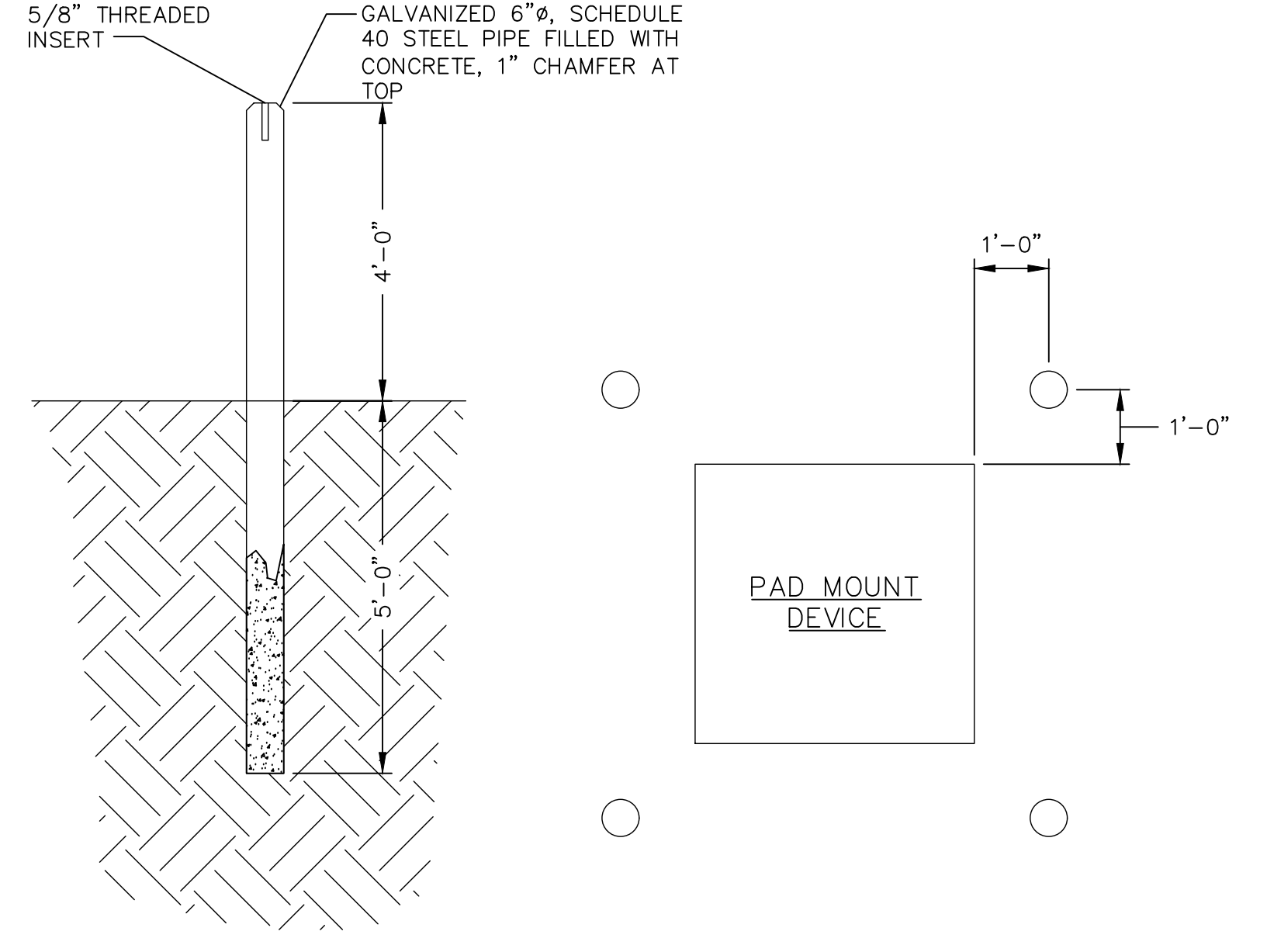
UM2.2GX, CABLE TAGGING ASSEMBLIES - MISCELLANEOUS



RUS	QTY	MATERIAL
Uja	1	PAD, CONCRETE, 78"X72"X24"(UM1-1B)
	8	GRAVEL, D1 OR RECYCLED/CRUSHED CONCRETE, 1" MINUS (CU.YD.)

- NOTES:
- THIS UNIT INCLUDES THE PAD, GRAVEL, SITE PREPARATION, EXCAVATION AND BACKFILL.
 - LEVEL TOP OF PAD AND GRAVEL. THE GRAVEL INSIDE THE PAD SHALL BE LEVEL WITH THE BASE OF THE PAD.
 - PAD SHALL BE SQUARE WITH ADJACENT BUILDINGS AND ROADWAYS UNLESS SPECIFIED OTHERWISE. ORIENT THE PAD AWAY FROM POTENTIAL CONFLICTS TO PROVIDE ACCESS TO THE FRONT OF THE EQUIPMENT.
 - THE PAD SHALL CONFORM TO THE UTILITY MATERIAL SPECIFICATIONS.
 - VERIFY TRANSFORMER DIMENSIONS PRIOR TO ORDERING PAD.
 - FOR COOPER 12.47 kv, 75 AND 150 kVA TRANSFORMER USE PAD UM1-1A.

PAD, THREE PHASE TRANSFORMER/SECTIONALIZER 75-750 kVA, UM1-1B



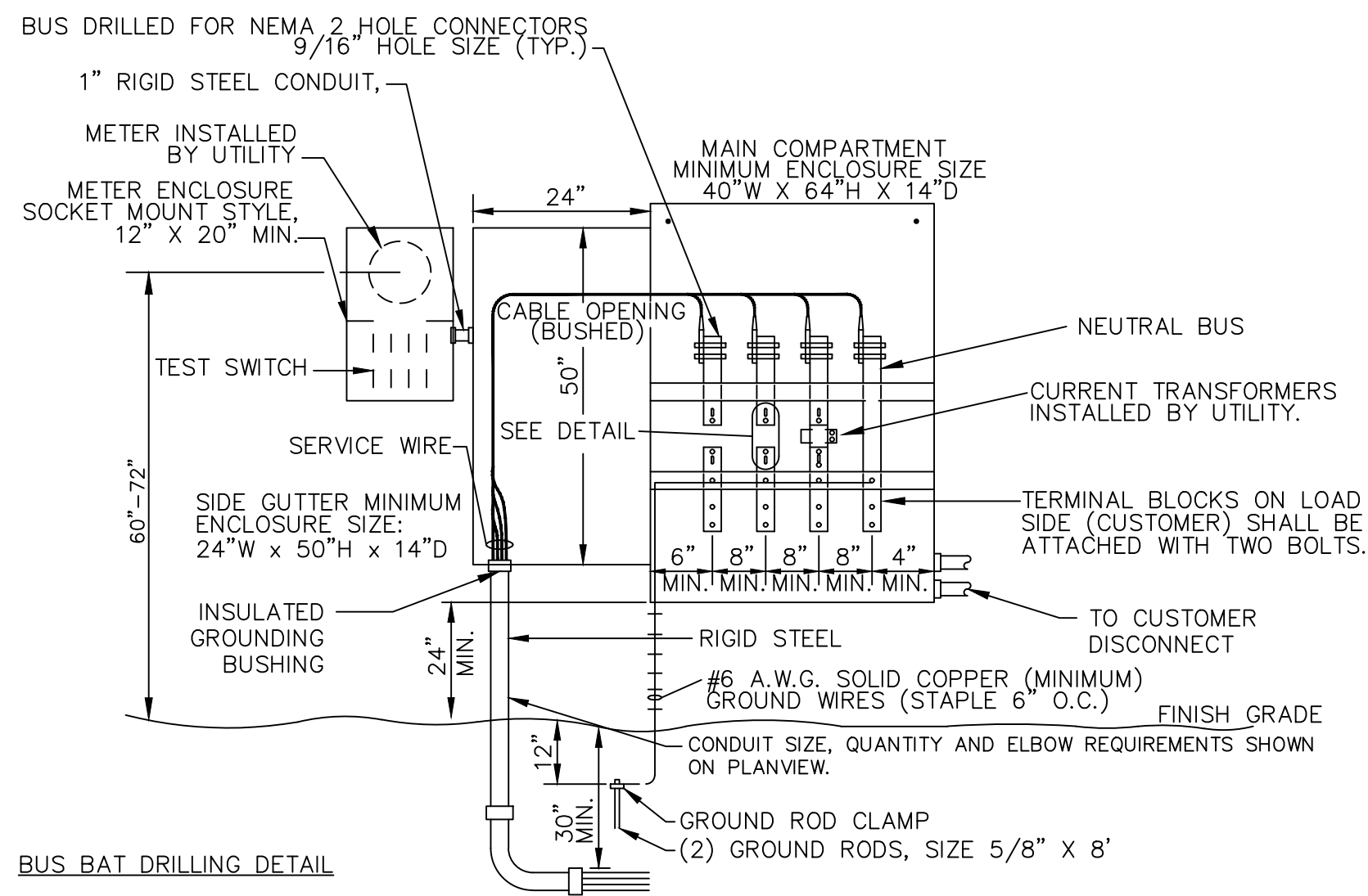
- NOTES:
- BOLLARD CONSTRUCTION OPTIONS:
1.1. TRAFFIC YELLOW PAINTED STEEL, 6" X 9'-0" (2500PSI CONCRETE FILLED WITH 5/8" THREADED INSERT).
1.2. YELLOW HDPE, 6" X 9'-0" (2500PSI CONCRETE FILLED WITH 5/8" THREADED INSERT).
 - BOLLARD LOCATIONS ARE SPECIFIED ON THE STAKING SHEET.
 - BOLLARD SHALL NOT BLOCK TRANSFORMER, J-BOX OR SWITCH ACCESS.
 - BACKFILL FOUNDATION WITH GRAVEL. BACKFILL SHALL BE MACHINE TAMPED IN 6-INCH LIFTS. 2000 PSI CONCRETE MAY BE USED IN PLACE OF GRAVEL IF DAILY LOW TEMPERATURES ARE ABOVE FREEZING AND WHEN APPROVED BY THE OWNER.

M-BOL, CONCRETE BOLLARD DETAIL

PROJECT: CITY OF SAINT PAUL TRIDENT SERVICE				
DESIGNER/PROJECT ENGINEER: CHRISTOPHER T. DAVIS				
W.O. #: EPS 23-0072				
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED (MGR/SUPV)/DATE	APPROVED (DIRECTOR)/DATE
0	ISSUED FOR CONSTRUCTION	MAP/04-24-23	CTD/04-24-2023	



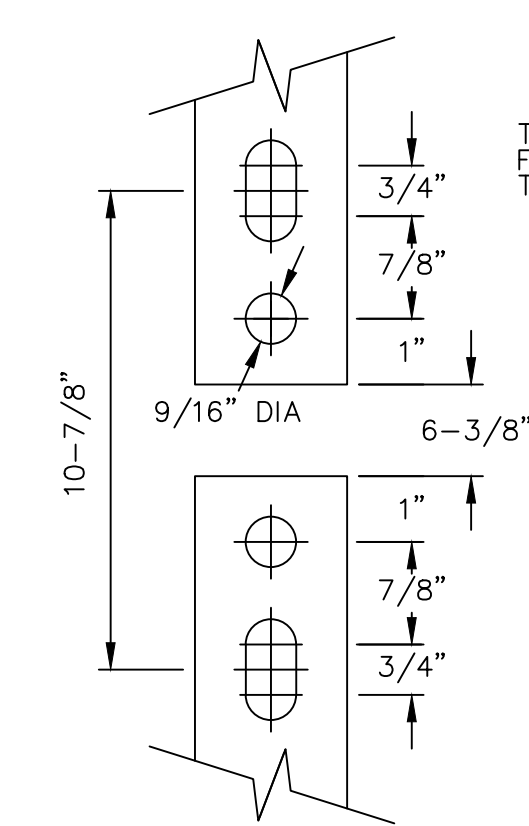
DRAWING NAME:	CITY OF SAINT PAUL TRIDENT SERVICE DETAILS
REF DWG(S):	
DRAWING NO.:	CSP-SPTS-S-01
	SHEET 6 OF 8



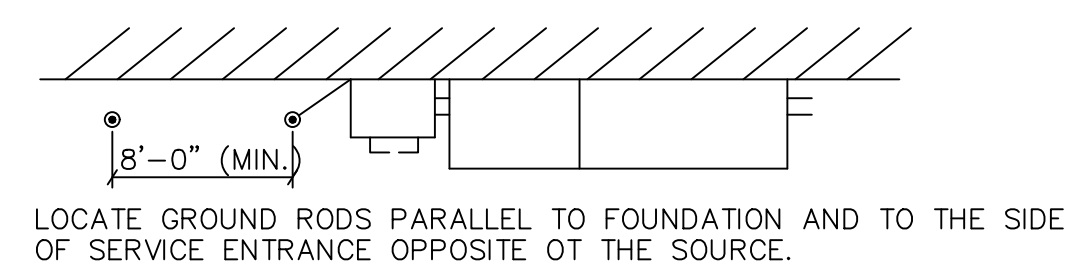
NOTES:

- BEFORE ANY SERVICE ENTRANCE IS INSTALLED ON ANY BUILDING, THE CUSTOMER, BUILDER OR AUTHORIZED REPRESENTATIVE SHALL OBTAIN AGREEMENT FROM UTILITY AS TO WHERE THE SERVICE ENTRANCE AND MULTI-METERED EQUIPMENT SHALL BE LOCATED. ALL CT ENCLOSURES AND METER BASES SHALL BE LOCATED ON THE OUTSIDE OF THE BUILDING. THE SERVICE ENTRANCE MUST BE INSTALLED AS CLOSE AS POSSIBLE TO EXISTING UTILITY FACILITIES.
- THE CUSTOMER'S SERVICE EQUIPMENT SHALL CONFORM TO THE LATEST REVISION OF THE NATIONAL ELECTRIC CODE. UL LISTING IS REQUIRED WHERE APPLICABLE.
- THE CUSTOMER SHALL PROVIDE A 13 TERMINAL TRANSFORMER RATED METER SOCKET WITH TEST SWITCH MOUNTING PROVISIONS. THE METER SOCKET ENCLOSURE SHALL BE A MINIMUM OF 12" W X 20" H.
- THE CUSTOMER SHALL PROVIDE A NEMA TYPE 3R CURRENT TRANSFORMER (CT) CABINET WITH A MINIMUM ENCLOSURE SIZE OF 50" W X 60" H X 14" D. THE MAIN COMPARTMENT MINIMUM THE MAIN COMPARTMENT MINIMUM DIMENSIONS ARE 36" W X 60" H X 14" D AND THE SIDE GUTTER COMPARTMENT DIMENSIONS ARE 14" W X 50" H X 14" D WITH A BUSHED CABLE OPENING TO THE MAIN COMPARTMENT. THE CABINET MUST PROVIDE FOR TERMINATION OF THE LINE SIDE AND LOAD SIDE CONDUCTORS INDEPENDENT OF THE CT MOUNTING. THE CABINET SHALL ALSO INCLUDE INSULATED CT SUPPORT BRACKETS WITH BUS BAR DRILLING TO MOUNT CT'S. A NEUTRAL TERMINATION BAR IS ALSO REQUIRED.
- THE SIDE HINGED ENCLOSURE COVER MUST BE SECURELY FASTENED TO THE BOX AND EQUIPPED WITH TABS OR PLATES FOR SEALS AND LOCKS (5/16 INCH SHANK PADLOCK), AND THE DOOR SHOULD OPEN AND CLOSE EASILY.
- CUSTOMER SHALL INSTALL RIGID STEEL CONDUIT (1" MINIMUM) BETWEEN THE METER BASE AND THE CT CABINET. THE CONDUIT SHALL BE A DIRECT RUN WITH NO JUNCTION BOXES. THE CONDUIT LENGTH SHALL NOT EXCEED 20 FEET.
- THE SOURCE SIDE CONDUIT SHALL BE GALVANIZED RIGID STEEL CONDUIT. THE SIZE, QUANTITY AND ELBOW REQUIREMENTS SHALL BE SHOWN ON PLANS AND INSTALLED BY THE CUSTOMER.
- BONDING-TYPE LOCKNUTS MAY BE SUBSTITUTED FOR SERVICE CONDUIT GROUNDING BUSHING AND JUMPERS, WHERE ALL CONCENTRIC KNOCKOUTS ARE REMOVED. IF BONDING-TYPE LOCKNUTS ARE USED, AN INSULATING BUSHING IS REQUIRED. FIBER BUSHINGS ARE ACCEPTABLE IF FULLY THREADED ONTO CONDUIT.

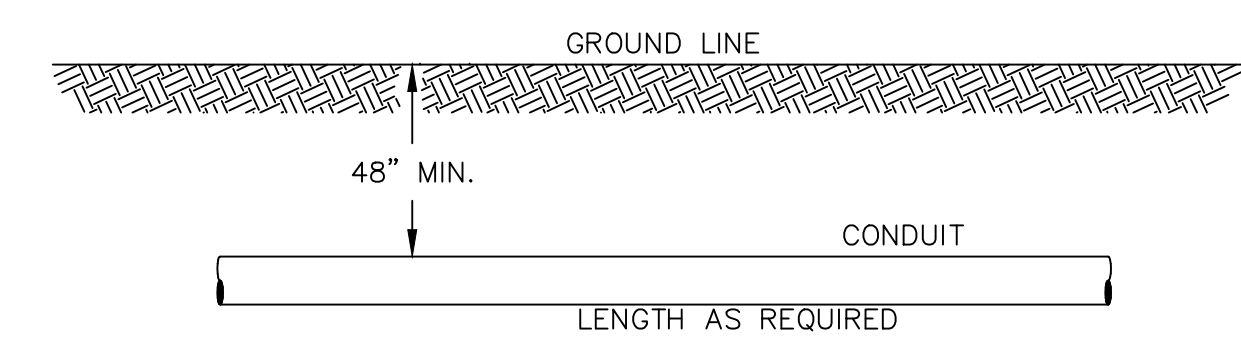
BUS BAR DRILLING DETAIL



THE BUS BAR DRILLINGS WILL BE FURNISHED TO MOUNT CURRENT TRANSFORMERS.



**SERVICE DISCONNECT, THREE PHASE
1400A, SS-14-4-B**



SPECIFICATION NUMBER CODES:
UM50-(H, P, PH or S)-(DIAMETER)

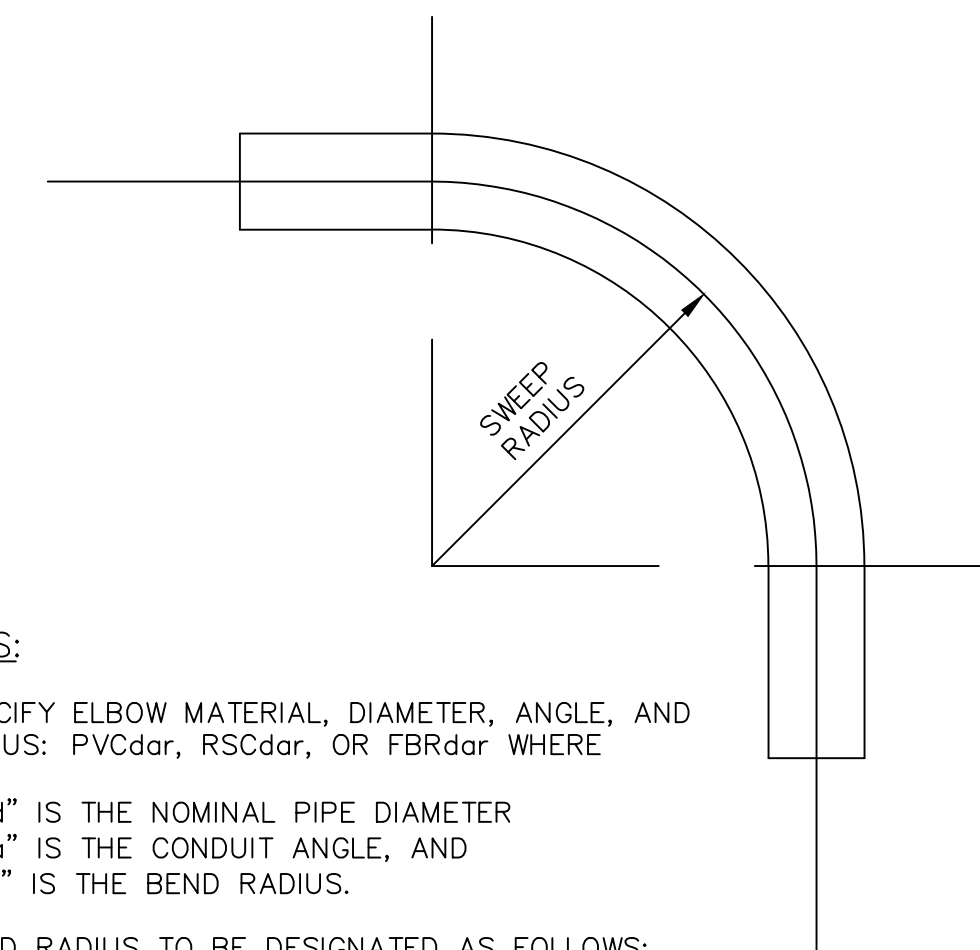
EXAMPLE: UM50-S-3
IS 3" STEEL CONDUIT

MATERIAL	-H-2	-H-3	-H-4	-H-6
1-2" HDPE CONDUIT ¹				
1-3" HDPE CONDUIT		1		
1-4" HDPE CONDUIT			1	
1-6" HDPE CONDUIT				1
	-P*-2	-P*-3	-P*-4	-P*-6
1-2" P.V.C. CONDUIT ¹				
1-3" P.V.C. CONDUIT		1		
1-4" P.V.C. CONDUIT			1	
1-6" P.V.C. CONDUIT				1
	-S-2	-S-3	-S-4	-S-6
1-2" STEEL CONDUIT ¹				
1-3" STEEL CONDUIT		1		
1-4" STEEL CONDUIT			1	
1-6" STEEL CONDUIT				1

NOTES:

- SPECIFY TRENCH UNIT SEPARATELY.
- EACH UNIT CONSISTS OF ONE LINEAR FOOT OF CONDUIT.
- HDPE IS SCHEDULE 40 UNLESS OTHERWISE SPECIFIED.
- FOR PVC CONDUIT, P INDICATES SCHEDULE 40, PH INDICATES SCHEDULE 80.

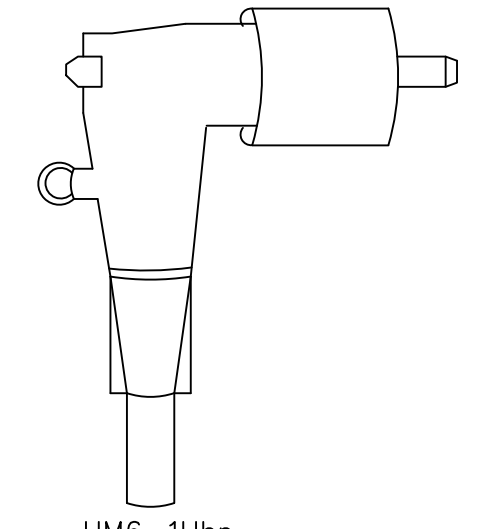
**UM50-X-X MISCELLANEOUS CONDUIT
INSTALLATION**



NOTES:

- SPECIFY ELBOW MATERIAL, DIAMETER, ANGLE, AND RADIUS: PVCdar, RSCdar, OR FBRdar WHERE
"d" IS THE NOMINAL PIPE DIAMETER
"a" IS THE CONDUIT ANGLE, AND
"r" IS THE BEND RADIUS.
- BEND RADIUS TO BE DESIGNATED AS FOLLOWS:
LS - LONG SWEEP - 36" RADIUS FOR 2"
48" RADIUS FOR 4"
60" RADIUS FOR 6"
SS - SHORT SWEEP - 24" RADIUS FOR 2"
36" RADIUS FOR 4"
48" RADIUS FOR 6"
FOR EXAMPLE, RSC290SS IS RIGID STEEL 2 INCH 90 DEGREE ELBOW WITH A 24 INCH BEND RADIUS.
- UNIT INCLUDES INSTALLATION OF ANY BUSHINGS NECESSARY TO ATTACH TO ADJACENT CONDUIT.

**RSCdar CONDUIT ELBOW GUIDE
(MATERIAL, DIAMETER, ANGLE, RADIUS)
PHdar(SCHED. 80), PVCdar, RSCdar**



UM6-1Uhp
LOAD BREAK ELBOW
(200 A)

NOTES:

- FOR PRIMARY SPLICES AND TERMINATIONS, THE CONDUCTOR SIZE AND TYPE SHALL BE DESIGNATED BY THE FOLLOWING SUFFIX (E.G., A 200 AMP LOADBREAK ELBOW FOR #1/0 CONC WOULD BE INDICATED AS UM6-1-A):
A - #1/0 CONC
B - #4/0 TAPE SHIELD CU
C - 500 MCM TAPE SHIELD CU
D - #2 CONC*
E - #2 TAPE SHIELD CU*
F - #4/0 CONC*
G - #1/0 TAPE SHIELD CU*
H - #2/0 CONC*
I - OTHER (SPECIFIED ON STAKING SHEETS AND DESIGN)
* NON-STANDARD CONDUCTOR

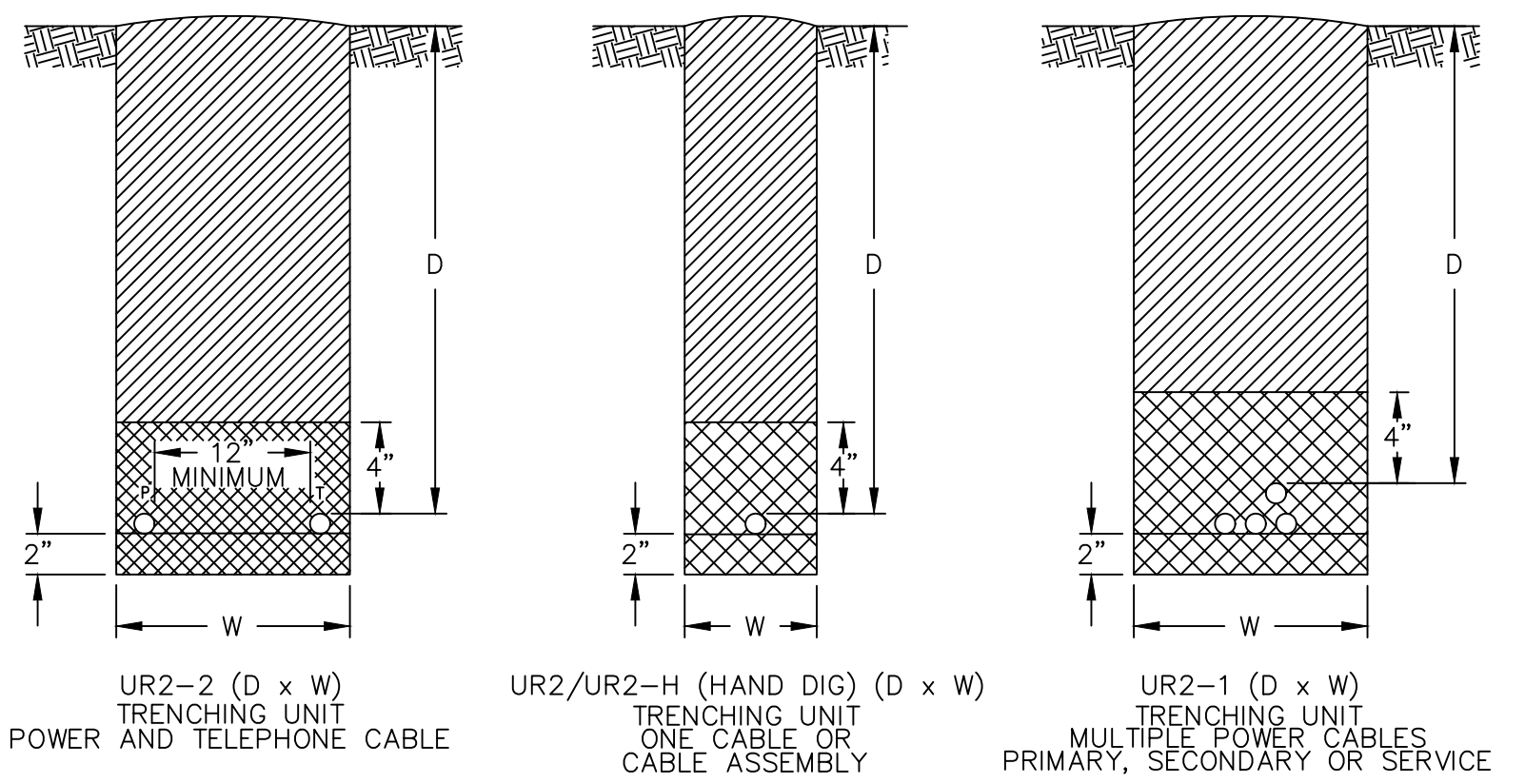
**UM6-1, LOAD BREAK
ELBOW (200A)**

LEGEND

	SAND OR CLEAN SOIL
	COMPACTED BACKFILL UNLESS OTHERWISE SPECIFIED
	UNDISTURBED EARTH

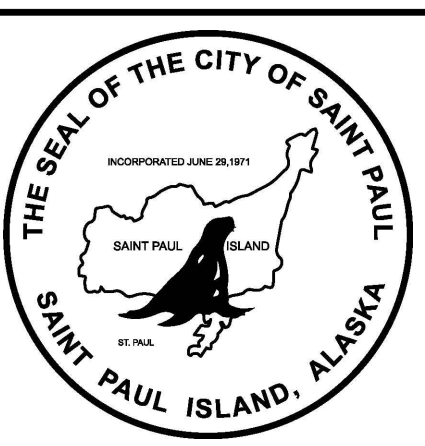
NOTES:

- DEPTH (D) IS 48" FOR PRIMARY / 30" MIN FOR SECONDARY EXCEPT BENEATH ROADWAYS WHERE 48" SHALL APPLY AND WIDTH (W) IS 24" UNLESS OTHERWISE SPECIFIED IN DESCRIPTION OF UNIT.
- DEPTHS SPECIFIED ARE TO FINISHED GRADE.
- OVER-EXCAVATE TRENCHES AS NECESSARY TO ALLOW FOR (a) SAND BEDDING OR (b) LOOSE SANDY SOILS OR (c) WHERE MORE THAN ONE CABLE WILL BE INSTALLED IN TRENCH AND LAYING FIRST CABLE MAY CAUSE TRENCH DAMAGE AND REDUCTION IN DEPTH.
- SAND BEDDING IS NOT PART OF THESE UNITS AND WILL BE SPECIFIED AS NEEDED.
- BACKFILLING IS PART OF ALL TRENCHING UNITS INCLUDING JOINT-USE TRENCHES.
- AREA DISTURBED BY TRENCHING SHALL BE LANDSCAPED TO PRE-EXISTING CONDITION.
- ALL BACKFILL MUST BE COMPACTED USING MECHANICAL COMPACTION METHODS IN 12" MAXIMUM LIFTS. COMPACTION OF BACKFILL MUST NOT DISTURB, MOVE, OR AFFECT THE CONDUIT/CABLE.
- WARNING TAPE IS TO BE PLACED ABOVE THE INSTALLED CABLE 12" BELOW GRADE.



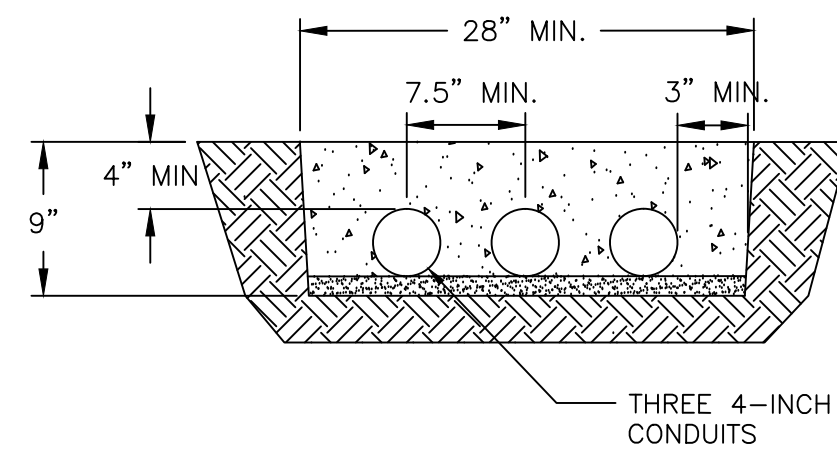
**TRENCHES FOR DIRECT BURY CABLE AND CONDUIT
UR2, UR2-H, UR2-1, UR2-2**


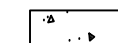

PROJECT: CITY OF SAINT PAUL TRIDENT SERVICE		DESIGNER/PROJECT ENGINEER: CHRISTOPHER T. DAVIS		W.O. #: EPS 23-0072	
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CITY OF
Saint Paul
ALASKA

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SHEET	7 OF 8



- LEGEND**
-  SAND BEDDING
 -  RED CONCRETE ENCASEMENT
 -  UNDISTURBED EARTH

DUCT:

1. FEEDER #1, 4-#350KCMIL CU.
2. FEEDER #2, 4-#350KCMIL CU.
3. FEEDER #3, 4-#350KCMIL CU.

NOTES

1. THE CONTRACTOR SHALL NOTIFY THE UTILITY INSPECTOR 24 HOURS PRIOR TO EXCAVATION.
2. ALL DEPTHS SPECIFIED ARE TO FINISHED GRADE.
3. CONDUIT NOT INCLUDED IN DUCT BANK UNITS.
4. BACKFILL SHALL NOT CONTAIN FROZEN MATERIAL, ROOTS, SOD, OR OTHER ORGANIC MATTER. IN SITU MATERIAL MAY BE USED FOR BACKFILL UNLESS OTHERWISE DIRECTED BY THE OWNERS REPRESENTATIVE. BACKFILL SHALL BE COMPACTED TO NOT LESS THAN 95% OF ITS MAXIMUM DENSITY IN 12" LIFTS.
5. ALL EXCAVATIONS SHALL BE IN COMPLIANCE WITH USACE REQUIREMENTS AND STATE AND FEDERAL OSHA REQUIREMENTS FOR EXCAVATIONS AND MUNICIPAL/BOROUGH, STATE, OR DPW ROAD CROSSING PERMIT PROVISIONS (AS APPLICABLE). WHEN LOCAL OR STATE INSTALLATION REQUIREMENTS EXCEED UTILITY REQUIREMENTS, THE AGENCY WITH JURISDICTION SHALL PREVAIL (WHERE APPLICABLE).

**DUCT BANK (CONCRETE ENCASED TRENCH)
UR-DB**

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