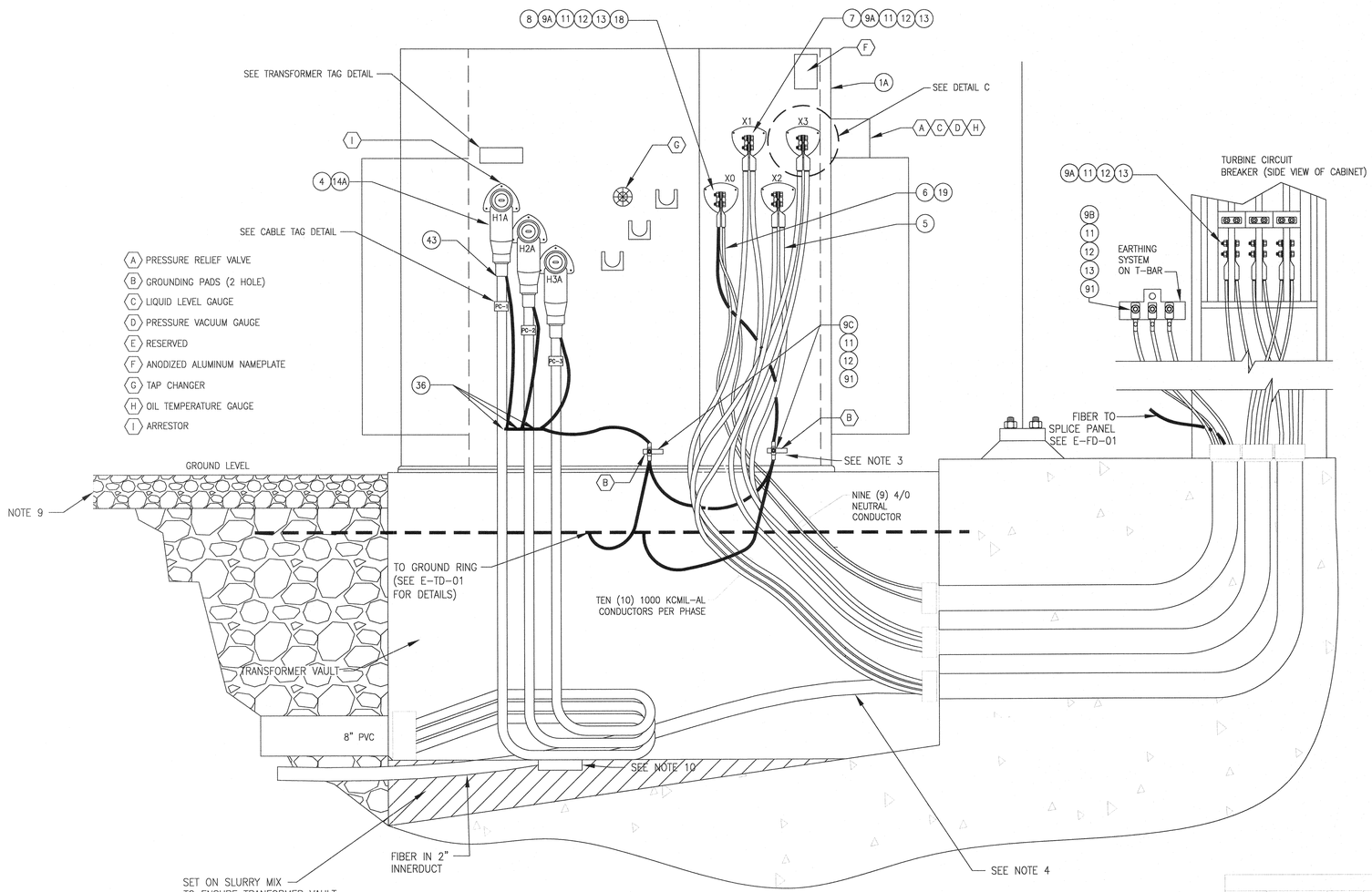


STEP UP RADIAL TRANSFORMER, FRONT VIEW (TYPICAL)

N.T.S.

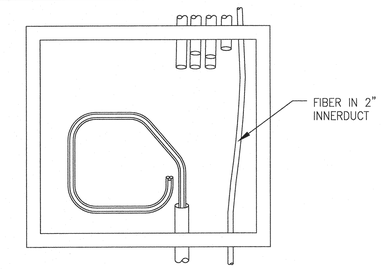
PC-1

CABLE TAG DETAIL

NOTES:

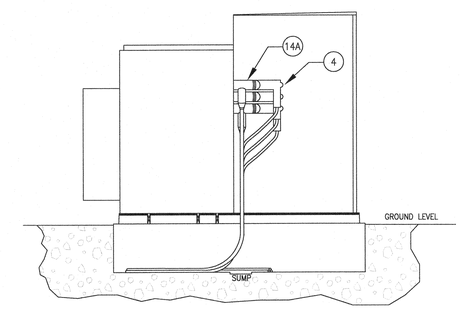
1. SIGN BACKING FOR EXTERIOR SIGNS SHALL BE 1/8 IN ALUMINUM OR EQUAL.
2. USE SELF TAPPING SCREWS TO MOUNT SIGNAGE ON TRANSFORMER AND SWITCH DOORS.

TRANSFORMER TAG DETAIL



CABLE COIL – TOP VIEW

N.T.S.
(TYPICAL OF ALL)

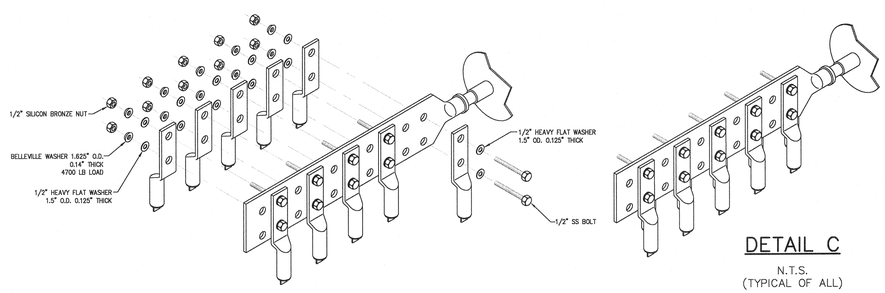


STEP UP TRANSFORMER, SIDE VIEW

N.T.S.
(TYPICAL OF ALL)

NOTES:

1. ID INDICATE DESTINATION FOR EACH CIRCUIT.
2. MARK EACH PHASE WITH COLOR TAPE AS FOLLOWS:
   - LV CABLES ARE COLORED: X1=BROWN, X2=ORANGE, X3=YELLOW
   - FOR MV, H1(A)=BLACK, H2(B)=RED, H3(C)=BLUE
3. BOND GROUND RODS TO ALL APPLICABLE GROUNDING LUGS ON TRANSFORMER AND TERMINATE ON THE PADMOUNT GSU NEUTRAL BUSHING.
4. REFER TO CONDUIT & GROUNDING DETAILS DWG E-TD-31 FOR PROPER CONDUIT PLACEMENT, LENGTHS AND MATERIALS.
5. WHEN PULLING 1000 KCMIL 2KV CABLE THROUGH 4" CONDUITS, IT IS RECOMMENDED TO BUNDLE AND STRAP THE CABLE TOGETHER BEFORE PULLING IN ORDER TO PREVENT JAMMING. CONTACT ENGINEER AS NEEDED.
6. EACH SET OF MV CABLES WILL BE TERMINATED ONTO A SINGLE SET OF BUSHINGS. NO PIGGYBACKING OF ELBOWS.
7. CAULK INTERFACE OF PAD AND BASE OF TRANSFORMER OR INSIDE OF CABINET. ALL CONDUIT ENDS SHALL BE SEALED WITH FOAM AFTER CABLE INSTALLATION.
8. 34.5KV CABLES SHALL BE INSTALLED WITH SUFFICIENT SLACK TO ALLOW FOR FUTURE RE-TERMINATION AND BE COILED INSIDE THE GSU VAULT. CONTRACTOR SHALL INSURE COILED CABLE WILL MEET THE CABLES MINIMUM BENDING RADIUS.
9. CRUSHED ROCK TO BE INSTALLED AROUND PADMOUNT TRANSFORMER AS SHOWN ON E-TD-31.
10. WHEN POURING SLURRY MIX FOR TRANSFORMER VAULT BASE, PLACE A 12"X4" SUMP HOLE DIRECTLY UNDER CABLE OPENING IN VAULT BASE. SLOPE BASE TOWARDS SUMP.
11. MAXIMUN INSTALL TENSION IS 480 IN./LBS (40 FT/LBS)



DETAIL C

N.T.S.
(TYPICAL OF ALL)

BILL OF MATERIALS - SIEMENS 3.0MW STEP-UP TRANSFORMER, RADIAL FEED

ITEM	QUANTITY	UNIT	DESCRIPTION	MANUFACTURER	CATALOG
1A	1	EA	GSU PADMOUNT TRANSFORMER 34500 Δ - 690 Y/398, 3300/3696 MVA 55°/65°C RISE, Z=6%	CG POWER SYSTEMS	
1G	1	EA	TRANSFORMER PAD, 8'X12'X6" VAULT	OLD CASTLE PRECAST	DWG# 110-'06125-8X14 TOP REV. C
4	3	EA	ARRESTER, SURGE, 22.0kV MCOV, ELBOW	COOPER	32/38020C27M
5	1040	FT	WIRE, 1000 KCMIL AL 2KV RHH/RHW XLPE (10 CONDUCTORS / PHASE, 30' / CABLE, INC. 15% ADD)	SOUTHWIRE	1000-58 3E AL RHH-RHW-2 2kV PARALLELED
6	375	FT	WIRE, 4/0 COPPER BARE, STR		
7	60	EA	LUG, COMPRESSION, ALUMINUM, 2 HOLE, 1000 kcmil str	BURNDY	HYLUG YA44A9
8	9	EA	LUG, COMPRESSION, COPPER, 2 HOLE, 4/0 AWG FOR NEUTRAL CONNECTION	BURNDY	YGHA28-2N
9A	70	EA	BOLT, 302 OR 316 STAINLESS, 1/2"-13 x 2-1/2"		
9B	9	EA	BOLT, 302 OR 316 STAINLESS, 1/2"-13 x 1-1/2"		
11	149	EA	WASHER, STAINLESS, FLAT, ROUND, 1/2", 1.25" OD, 0.125" TK		
12	79	EA	WASHER, BELLEVILLE, STAINLESS, 1/2", 1.25", 4700 LB		
13	79	EA	NUT, 1/2" ALLOY 650 SILICONE BRONZE		
14A	3	EA	ELBOW ASSEMBLY KIT, 600 AMP, 35kV, 1/0 AWG AL, 345 MILS	COOPER	TP635G13CCS1
18	1	EA	LUG, COMPRESSION, COPPER, 2 HOLE, 2/0 AWG FOR GROUND CONNECTION	BURNDY	YGHA26-2N
19	24	FT	WIRE, 2/0 COPPER BARE, STR		
36	3	EA	CONNECTOR, COPPER CRIMPIT #2-1/0 TO 2/0-4/0		
91	9	EA.	LUG, COMPRESSION, COPPER, 1 HOLE 4/0 AWG FOR T-BAR CONNECTION	BURNDY	YAZV28TC12FX

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	BNK	RJG	CSF	7/8/11	60% DELIVERABLE
B	BNK	RJG	CSF	8/16/11	85% DELIVERABLE
C	BNK	CSF	CSF	9/20/11	90% DELIVERABLE
0	BNK	CSF	JLM	10/4/11	ISSUED FOR CONSTRUCTION
1	NJG	KJB	KJB	2/22/13	CONSTRUCTION REVISIONS

Images in Drawing

REGISTERED PROFESSIONAL ENGINEER KENNETH J. BENOIT 6506 DATE 2-25-13 NORTH DAKOTA

RELEASED TO/FOR	B	C	D	0	1	2	3
CLIENT	7/8/11	8/16/11	9/20/11				
BID							
CONSTRUCTION				10/4/11			
PERMITTING							

DATE RELEASED

BARR

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Scale	N.T.S
Date	07/08/11
Drawn	BNK
Checked	CSF
Designed	RJG
Approved	JLM

minnesota power AN ALLETE COMPANY

Bison

A WIND ENERGY INITIATIVE OF MINNESOTA POWER IN NORTH DAKOTA

BISON 3 WIND PROJECT
MORTON & OLIVER COUNTIES, NORTH DAKOTA

COLLECTOR SYSTEM
690V STEP-UP TRANSFORMER RADIAL FEED

BARR PROJECT No. 34/33-1006
CLIENT PROJECT No.
DWG. No. E-PM-31
REV. No. 1