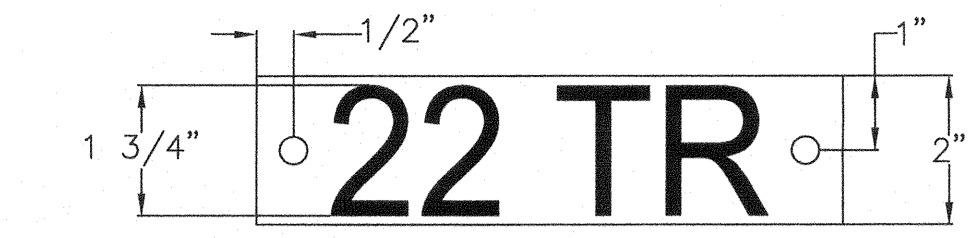


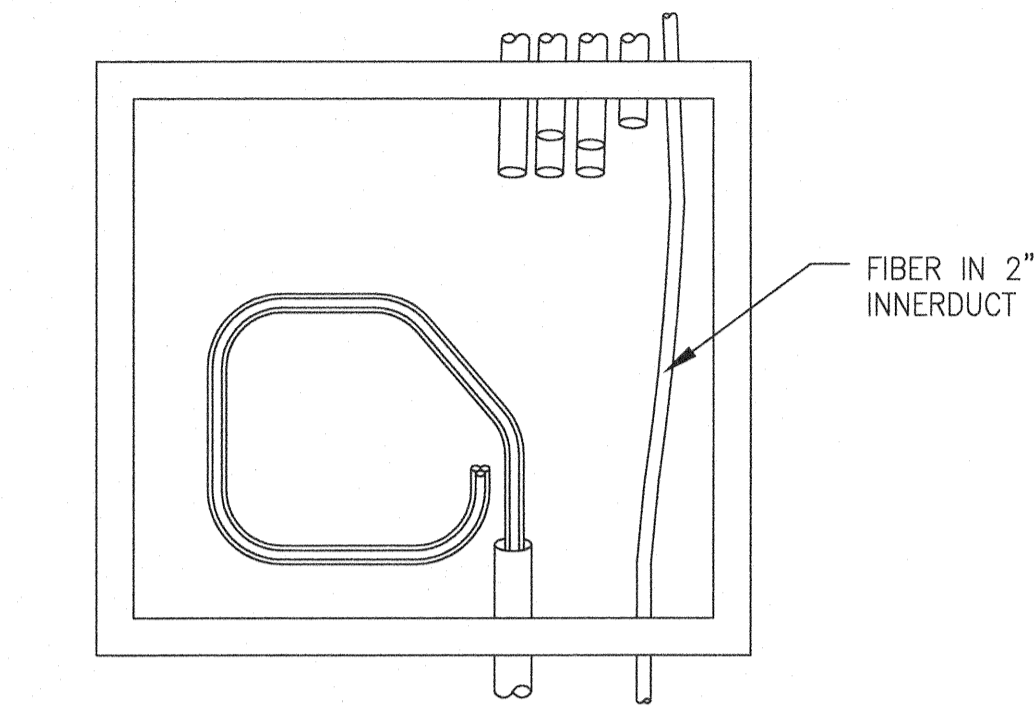
- A PRESSURE RELIEF VALVE
- B GROUNDING PADS (2 HOLE)
- C LIQUID LEVEL GAUGE
- D PRESSURE VACUUM GAUGE
- E RESERVED
- F ANODIZED ALUMINUM NAMEPLATE
- G TAP CHANGER
- H OIL TEMPERATURE GAUGE
- I ARRESTOR



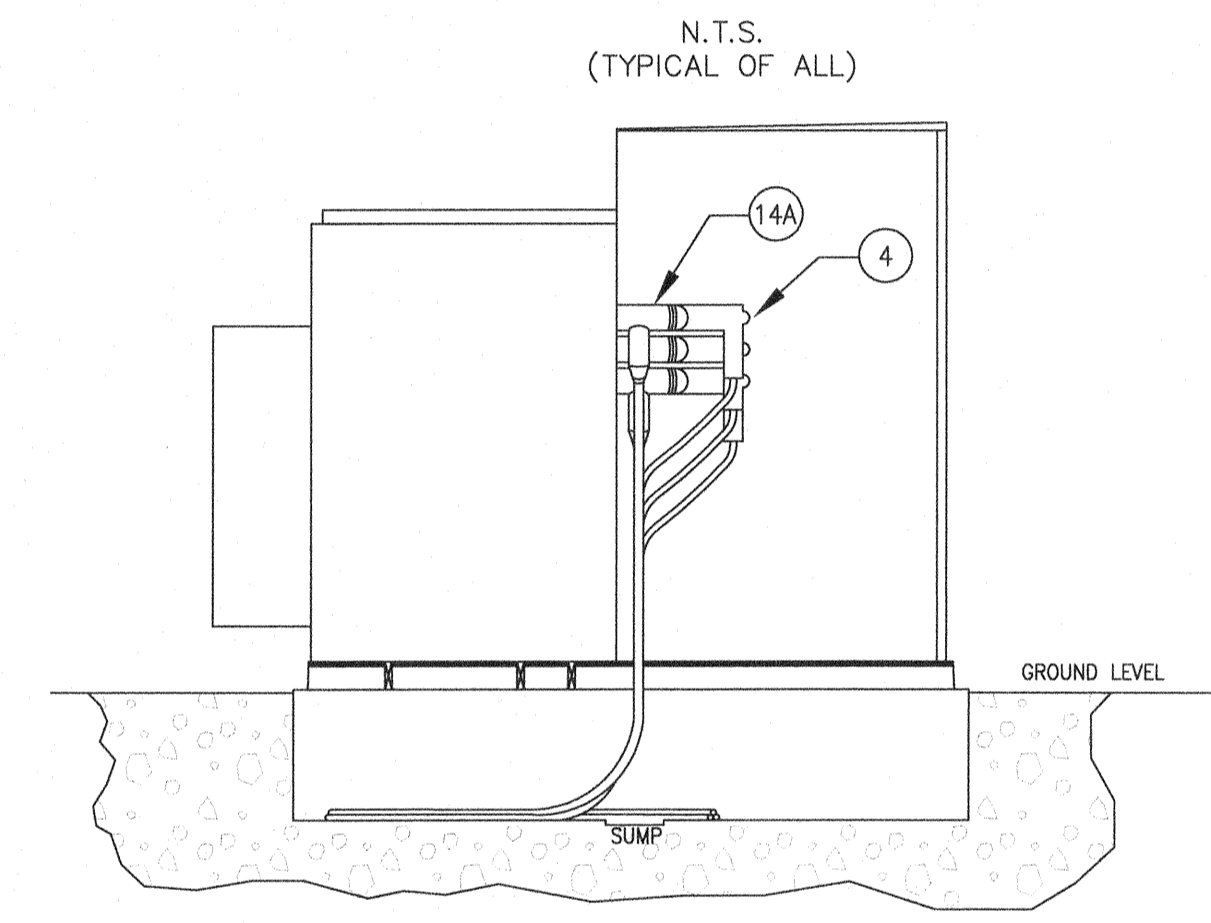
**CABLE TAG DETAIL**

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

**TRANSFORMER TAG DETAIL**



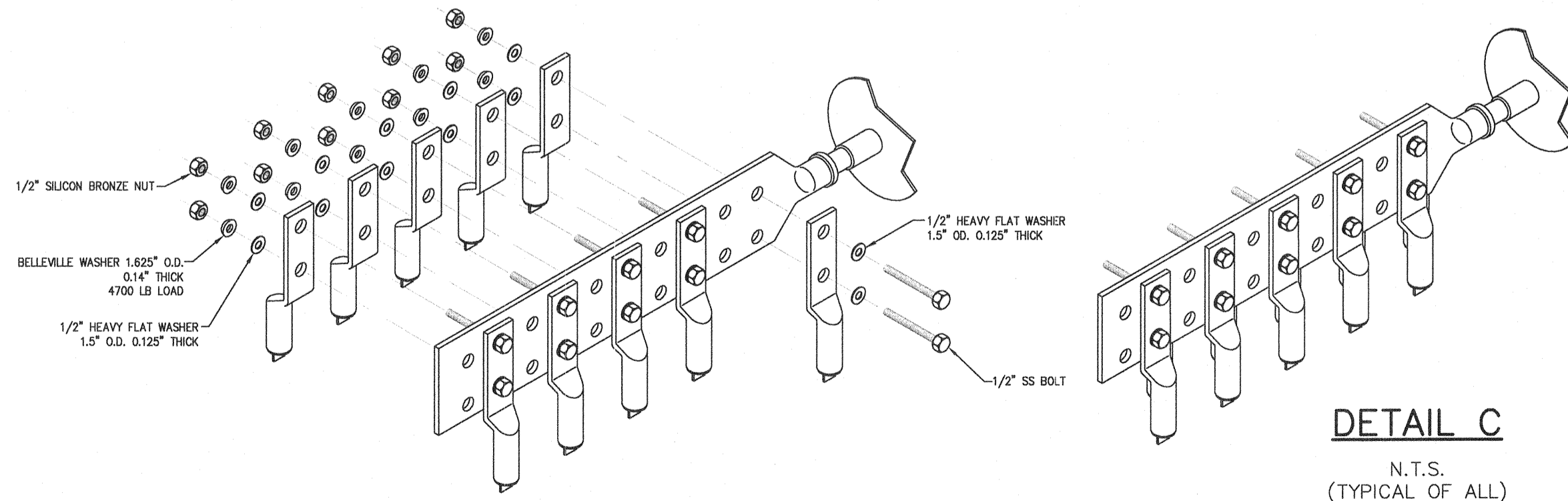
**CABLE COIL - TOP VIEW**



**STEP UP TRANSFORMER, SIDE VIEW**

**STEP UP RADIAL TRANSFORMER, FRONT VIEW (TYPICAL)**

N.T.S.



**DETAIL C**

N.T.S. (TYPICAL OF ALL)

- NOTES:
- ID INDICATE DESTINATION FOR EACH CIRCUIT.
  - 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
  - BOND GROUND RODS TO ALL APPLICABLE GROUNDING LUGS ON TRANSFORMER AND TERMINATE ON THE PADMOUNT GCU NEUTRAL BUSHING.
  - REFER TO CONDUIT & GROUNDING DETAILS DWG TDD1 FOR PROPER CONDUIT PLACEMENT, LENGTHS AND MATERIALS.
  - 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.
  - EACH SET OF MV CABLES WILL BE TERMINATED ONTO A SINGLE SET OF BUSHINGS. NO PIGGYBACKING OF ELBOWS.
  - CAULK INTERFACE OF PAD AND BASE OF TRANSFORMER OR INSIDE OF CABINET. ALL CONDUIT ENDS SHALL BE SEALED WITH FOAM AFTER CABLE INSTALLATION.
  - 34.5KV CABLES SHALL BE INSTALLED WITH SUFFICIENT SLACK TO ALLOW FOR FUTURE RE-TERMINATION AND BE COILED INSIDE THE GCU VAULT. CONTRACTOR SHALL INSURE COILED CABLE WILL MEET THE CABLES MINIMUM BENDING RADIUS.
  - CRUSHED ROCK TO BE INSTALLED AROUND PADMOUNT TRANSFORMER AS SHOWN ON E-TD-01.
  - 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.
  - MAXIMUM INSTALL TENSION IS 480 IN./LBS (40 FT/LBS)

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# 110-106125-8X14 TOP REV. C	
4	3	EA	ARRESTOR, SURGE, 22.0KV MCOV, ELBOW	COOPER	3238020C27M	
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	YGH28-2N	
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	YGH28-2N	
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	

A RJG ISGP CSF 5/27/11 60% DELIVERABLE B BNK RJG CSF 7/8/11 90% DELIVERABLE C BNK RJG CSF 7/19/11 REVISED FOR QA CHECKS D BNK RJG CSF 7/21/11 REVISED PER CLIENTS COMMENTS O BNK RJG CSF 8/4/11 ISSUED FOR CONSTRUCTION 1 NJG RJG CSF 2/22/13 CONSTRUCTION REVISIONS		CLIENT 7/8/11/19/11/21/118/4/11 BID CONSTRUCTION PERMITTING	Project Office: BARR ENGINEERING CO. 4700 WEST 77TH STREET MINNEAPOLIS, MN. 55435-4803 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com	Scale N.T.S. Date 05/27/11 Drawn RJG Checked CEG Designed RJG Approved JLM	BARR PROJECT No. 34/33-1007 CLIENT PROJECT No. COLLECTOR SYSTEM 690V STEP-UP TRANSFORMER RADIAL FEED	DWG. No. E-PM-01 REV. No. 1
		RELEASED TO/FOR B C D O 1 2 3 DATE RELEASED		A WIND ENERGY INITIATIVE OF MINNESOTA POWER IN NORTH DAKOTA		