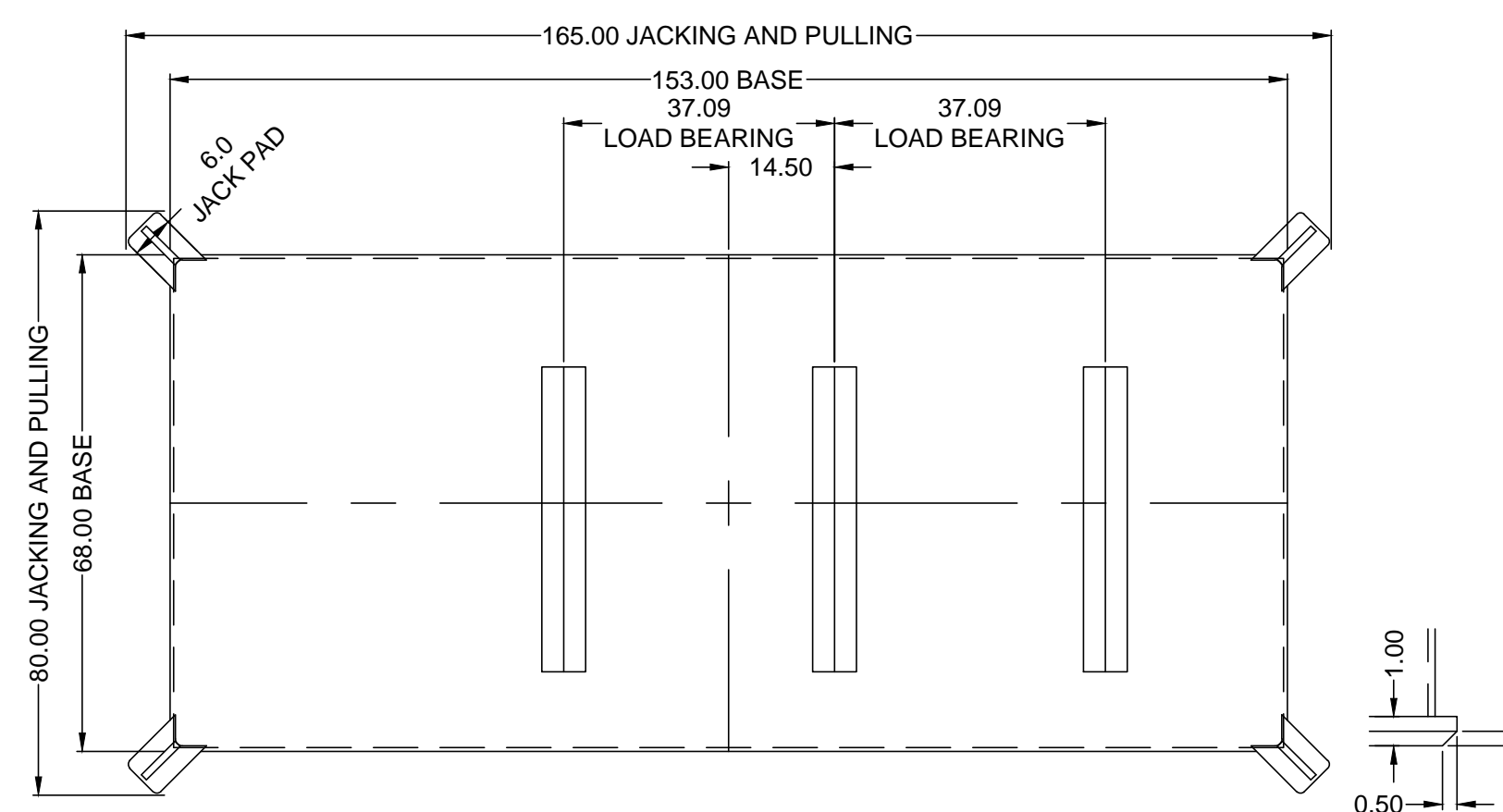
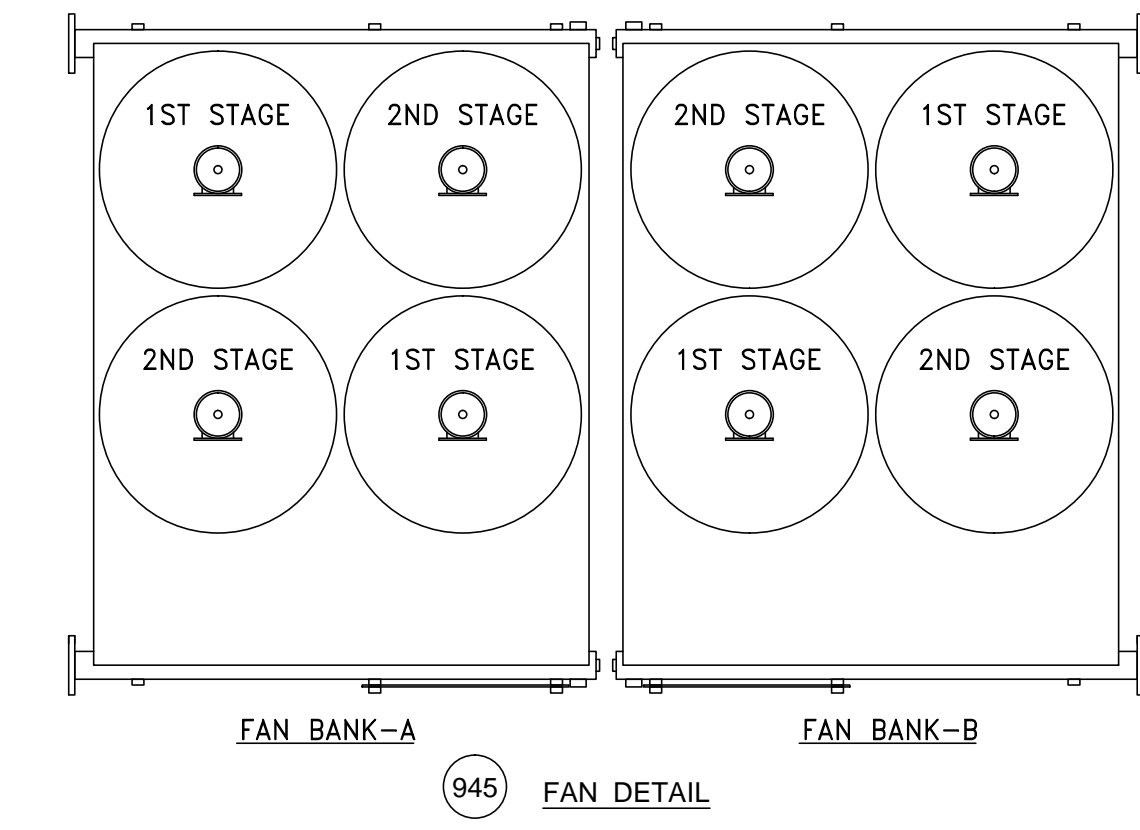


PLAN VIEW

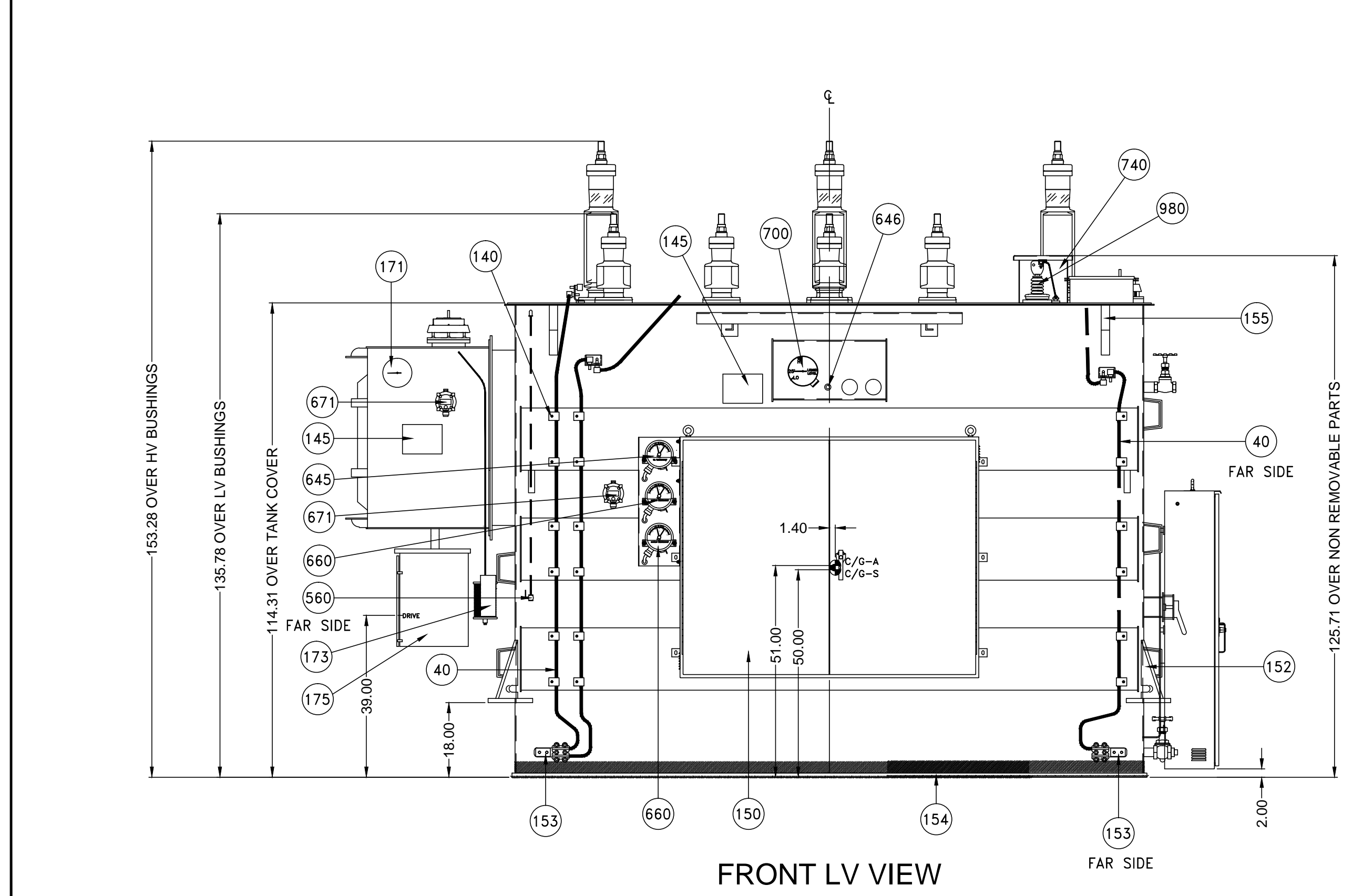


LV SIDE VIEW FROM TOP  
BASE IS EQUIPPED WITH PULLING PROVISIONS  
BASE MAY BE SKIDDED OR ROLLED ALONG EITHER AXIS  
BASE DETAIL

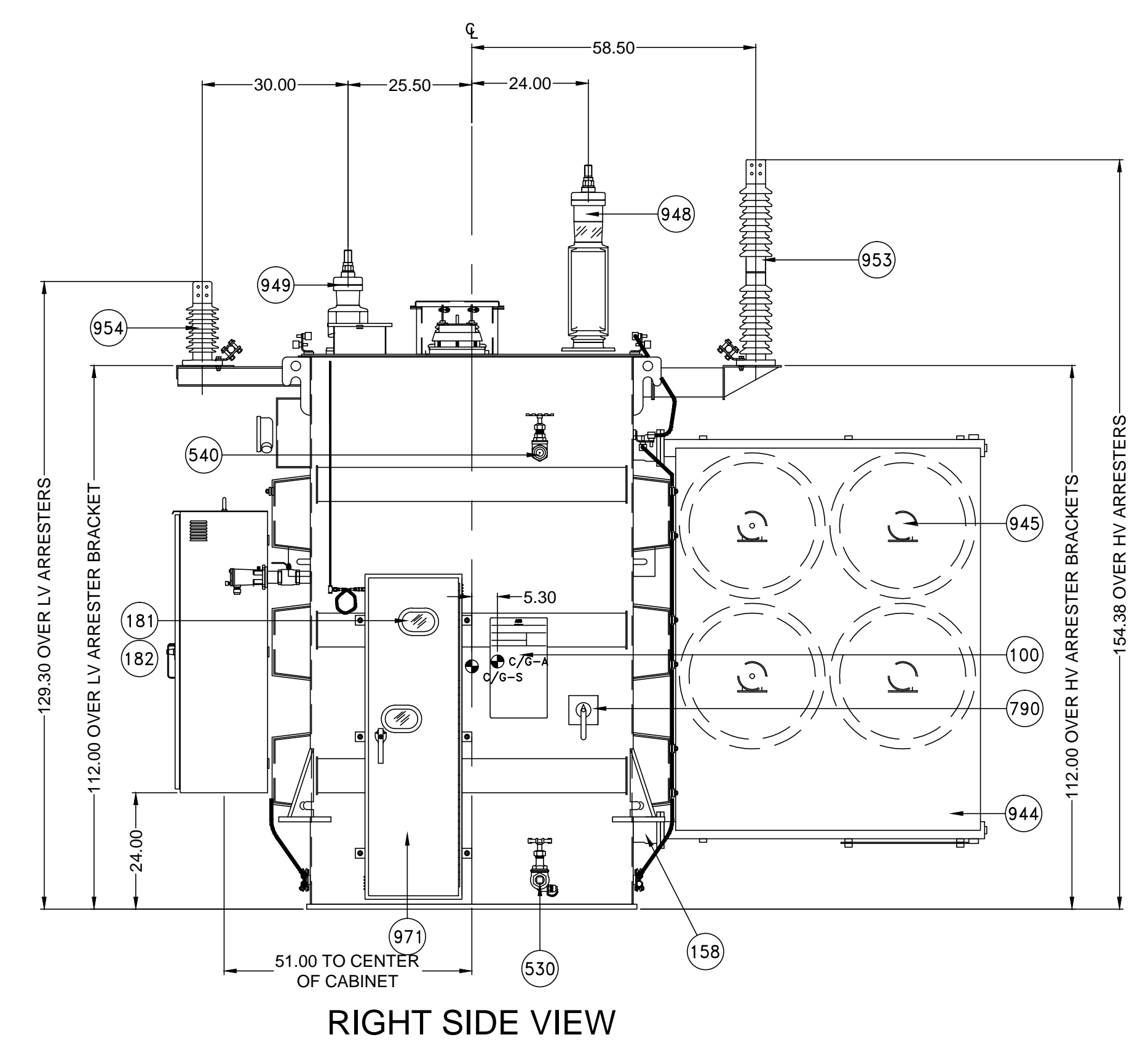


FAN DETAIL

VENDOR	CATALOG NO	ITEM	DESCRIPTION
--	--	030	COVER WITH NON-SKID SURFACE
--	--	040	HV, LV AND LVN GROUND CABLE (250 CABLE) W/ GROUND PAD MODIFIERS AND CONN.
--	--	070	HV ARRESTER BRACKETS
--	--	100	TRANSFORMER NAMEPLATE
--	--	140	STUDS, .50 -13 (FOR CUSTOMER GROUNDING) W/ CONNECTORS (GOOD FOR 250 CABLE)
--	--	145	JUNCTION BOXES
--	--	150	CONTROL CABINET WITH (2) REMOVABLE PLATES 28.80 LONG X 12.00 WIDTH OVER A 26.80 X 10.00 CUTOUPS
--	--	151	TRANSFORMER, COVER LIFTING EYES (FOUR PLACES)
--	--	152	TRANSFORMER, JACKPAD (FOUR PLACES)
--	--	153	GROUNDING PROVISIONS (TWO 0.50-13 TAPPED ON 1.75" CENTERS) STAINLESS STEEL
--	--	154	TRANSFORMER BASE (SEE DETAIL) W/ ASPHALT UNDERCOAT
--	--	155	TRANSFORMER LIFTING FACILITIES (FOUR PLACES)
--	--	156	SAFETY PROVISION UNIHOIST
--	--	157	CURRENT TRANSFORMER JUNCTION BOX
--	--	158	RADIATOR SHUT-OFF VALVE -- BUTTERFLY TYPE
--	--	160	LV ARRESTER BRACKET (BOLTED ON)
REINHAUSEN	--	170	LOAD TAP CHANGER RMV-II-1500-15 KV
REINHAUSEN	--	171	LTC LIQUID LEVEL INDICATOR
REINHAUSEN	--	172	LTC 2.00 FLANGED GLOBE DRAIN VALVE W/SAMPLER
MESSKO	--	173	LTC DEHYDRATING BREATHER
REINHAUSEN	--	174	LTC FILLING PLUG
REINHAUSEN	--	175	LTC MOTOR DRIVE UNIT WITH POSITION INDICATOR
--	--	181	PRESSURE GAUGE (INSIDE NITROGEN CABINET)
--	--	182	PRESSURE REGULATOR (INSIDE NITROGEN CABINET)
MESSKO	--	500	PRESSURE RELIEF DEVICE (10 PSI)
--	--	530	DRAIN VALVE 2.0 WITH 3/8 SAMPLER AND END PLUG
--	--	540	VALVE 2.00 GLOBE WITH END PLUG
--	--	547	VACUUM CONNECTION 4.00 WITH COVER (7.25 BOLT CIRCLE)
--	--	560	VALVE 0.25 BALL BRONZE (GAS SPACE SAMPLE/FILL)
MESSKO	MT-ST160RM/2C	645	GAUGE, LIQUID TEMPERATURE
--	--	646	TEMPERATURE WELL
MESSKO	MT-ST160KRM/3C	660	GAUGE, WINTING TEMPERATURE (B PHASE AND C PHASE)M
QUALITROL	910-014-02	671	RAPID RISE RELAY (OIL) WITH 2.0" VALVE (MAIN AND LTC)
MESKO	MTO-ST160RM/1U/AF	700	OIL LEVEL INDICATOR
VIAT	3051004	701	PRESSURE RELIEF DEVICE (10 PSI)
--	--	712	MANHOLE WITH BOLTED COVER (20.0 DIA OPENING)
--	--	740	CORE GROUND
--	--	790	DE-ENERGIZED TAP CHANGER WITH PADLOCK PROVISIONS
--	--	804	BRACING RADIATOR CROSS (BOTTOM ONLY)
--	--	806	BRACING RADIATOR END (TOP AND BOTTOM)
TRAN TECH	--	944	RADIATOR (BOLTED ON) WITH 0.75 FILL AND DRAIN PLUG
FURISON	FB4-P6-D660	945	26.0 FAN (HORIZONTAL) 1140 RPM 1/3 HP 60 HERTZ 208/230 VOLTS 7496 CFM
ABB	06920400AC	948	HV BUSHING 69 KV 350 KV BIL 400 AMPS DRAW LEAD CONNECTED SILVER PLATED TOP STUD 1.50-12 (2.13 USABLE)
ABB	025W0412AT	949	LV, LVN BUSHING 25 KV 150 KV BIL 400/1200 AMPS BOTTOM CONNECTED SILVER PLATED TOP STUD 1.50-12 (2.13 USABLE)
ABB	Q054S8042A	953	HV ARRESTER 54 KV DUTY 42 MCOV WITH 8.75/10.00 BOLT CIRCLE FOR 0.50 DIA MOUNTING BOLTS WITH CORONA RINGS
ABB	Q010SA008B	954	LV ARRESTER 10 KV DUTY 8.4 MCOV WITH 8.75/10.0 BOLT CIRCLE FOR 0.50 DIA MOUNTING BOLTS
--	--	971	NITROGEN SYSTEM CABINET WITH (1) BOTTLE
WARCO	45A05401-1	980	CORE GROUND BUSHING 5 KV 75 KV BIL 785 AMPS



FRONT LV VIEW



RIGHT SIDE VIEW

POWER TRANSFORMER  
THREE PHASE, 60 HERTZ,  
COOLING CLASS ONAN/ONAF/ONAF  
12.0/16.0/20.0 MVA AT 55 DEGREE C RISE,  
13.44/17.92/22.40 MVA AT 65 DEGREE C RISE.  
HV-69000 DELTA, (350 KV BIL) WITH TAPS AT  
72450/70725/69000/67275/65550  
LV- 13800Y/7967, (110 KV BIL)

APPROXIMATE ASSEMBLED WEIGHT	POUNDS
CORE AND COIL	36869
TANK AND FITTINGS	18776
RADIATORS	5980
TANK OIL	3557 - GAL 26679
RADIATOR OIL	279 - GAL 2096
LTC OIL	280 - GAL 2100
TOTAL ASSEMBLED WEIGHT	92500

ITEMS MARKED \* ARE REMOVED FOR SHIPMENT

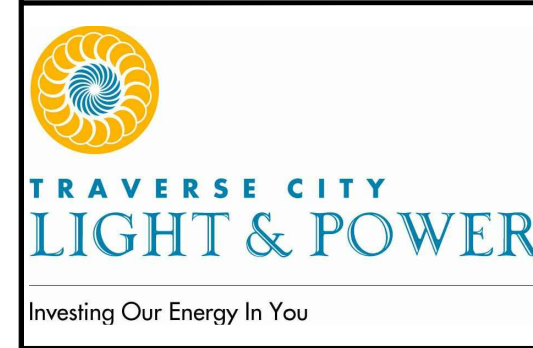
APPROXIMATE SHIPPING WEIGHT	POUNDS
SHIPPING UNIT	85232
SHIPPING PARTS	7268
TOTAL SHIPPING	92500

OIL REQUIRED TO COVER CORE AND COIL ASSEMBLY WITH RADIATORS INSTALLED 3114 GALLONS.  
WITHOUT RADIATORS INSTALLED 2869 GALLONS  
HV BUSHING REMOVAL HEIGHT IS 188 INCHES  
CORE AND COIL UNTANKING HEIGHT IS 208 INCHES

Q = CENTER LINE OF TANK  
C/G-A = CENTER OF GRAVITY ASSEMBLED.  
C/G-S = CENTER OF GRAVITY SHIPPING.

TRANSFORMER EXTERIOR COLOR IS ANSI 70 GRAY (3 MILS)

PAGE #1 OF THIS DRAWING IS INTENDED TO PROVIDE OVERALL WEIGHTS AND DIMENSIONS AND THE GENERAL LAYOUT OF THE TRANSFORMER. IT IS NOT INTENDED TO INDICATE THE EXACT DETAILS OF CONSTRUCTION. PAGE #2 IS FOR MANUFACTURING AND SHOWS CONSTRUCTION DETAILS AND MANUFACTURING INSTRUCTIONS



ENG.	AGC		
DR	AGC		
OK	RAS		
APP	RAS	1/23/2015	RECORD DRAWINGS
		5/30/2014	CONSTRUCTION
		DATE	ISSUED FOR

**GRP**  
**Engineering, Inc.**  
PETOSKEY, MICHIGAN, 231-439-9683  
GRAND RAPIDS, MICHIGAN, 616-942-7183

**TRAVERSE CITY LIGHT AND POWER**  
SOUTH SIDE SUBSTATION  
TRAVERSE CITY, MICHIGAN  
**TRANSFORMER NO.2 - OUTLINE DIAGRAM**

**PROJECT NUMBER**  
12-0462.01  
**DRAWING NUMBER**  
860