LITTLE GOOSE 500 KV SPARE GSU TRANSFORMER
REQUIREMENTS SUMMARY SHEET

(REFERENCE SPECIFICATION SECTION 48 19 23.04 26)

NAMEPLATE DATA:

- TYPE: CLASS II GSU POWER TRANSFORMER
- COOLING CLASS: ONAN/ONAF
- KVA RATING: 82,000 / 109,334
- VOLTAGE RATINGS: 500,000 GRDY (H) - 13,200 DELTA (X) 13,200 DELTA (Y)
- BIL LEVELS, KV: 1,425 (H) / 110 (X & Y) / 150 (H0)
- PHASING: SINGLE-PHASE
- IMPEDANCE: 9.2% @ 41,000 KVA (H-X & H-Y), 20.9% @ 41,000 KVA (X-Y)
- SECONDARY WINDING (H) DETC: 5 TAPS; 3 @ +2.5%, 1 @ -2.5% OF NOMINAL 500 KV TAP
- TEMPERATURE RISE: 65 ºC
- OIL PRESERVATION SYSTEM: NITROGEN BLANKET (PREFERRED) OR CONSERVATOR TANK
- MAXIMUM SOUND LEVEL (ONAF): 74 DB
- MAXIMUM NO-LOAD LOSSES: 52 KW
- MAXIMUM LOAD LOSSES: 175 KW
- FREQUENCY: 60 HZ
- MAXIMUM WEIGHT: 360,000 POUNDS (A)
- EXISTING OIL QUANTITY: 10,667 GALLONS (A)

TANK AND CONSTRUCTION:

- MAN-HOLE: 24-INCH DIAMETER (MINIMUM TWO)
- GASKETS: NITRILE NBR (BUNA-N), DURO 50-60, 25% COMPRESSION, WITH THE EXCEPTION THAT THE LOW-VOLTAGE BUSHING GASKETS WILL BE VITON. O-RING GASKETS SHALL NOT BE USED FOR GASKET GROOVES OF RECTANGULAR CROSS-SECTION.
- VALVES: STAINLESS STEEL BALL-TYPE (RADIATORS MAY USE BUTTERFLY-TYPE)
- PERSONAL FALL ARREST SYSTEM: THE TOP OF THE TRANSFORMER TANK SHALL BE COVERED WITH A NON-SLIP MATERIAL, THE SAME COLOR AS THE TANK WALLS. A FALL PROTECTION SYSTEM, CONSISTING OF A SINGLE ANCHOR POST, SHALL BE PROVIDED.
- BASE: DESIGNED FOR PAD MOUNTING WITH SEISMIC WELDING TO STEEL PLATES.
- LIFTING EYES: DESIGN LOADS FOR EACH EYE SHALL BE TWO TIMES THE ACTUAL LOAD.
- SEISMIC: SEISMIC CALCULATIONS REQUIRED FOR MAIN TANK AND ALL MAJOR COMPONENTS.
- CORE: LAMINATIONS MAXIMUM THICKNESS OF 0.270MM, COLD-ROLLED, GRAIN-ORIENTED STEEL. MAXIMUM DESIGN FLUX DENSITY OF 1.75 TESLA. STEP-LAP CONSTRUCTION.
- RADIATORS: HOT-DIP GALVANIZED.
- COOLING FANS: HORTIZONTAL-DRAFT

ACCESSORIES:

- WTI AND OTI GAUGES WITH RTDS - HARDENED FOR HARSH WEATHER CONDITIONS
- DIRECTED-FLOW PRESSURE RELIEF DEVICE WITH METAL DISCHARGE PIPING
- TRANSFORMER EMBEDDED FIBER-OPTIC WINDING TEMPERATURE MEASUREMENT PROBES

BUSHINGS:

- SECONDARY WINDING (H): 500 KV CLASS, MINIMUM 1,500 KV BIL, 1,600 AMP, OIL-FILLED BUSHING
  HITACHI TYPE O+ C T550W2000VV
  (TWO 1200:5 MRCT)
- PRIMARY WINDING (X): 25 KV CLASS, MINIMUM 150 KV BIL, 7,500 AMP, PORCELAIN CONSTRUCTION, BULK-TYPE, LOW-CORONA, LIGHT CONTAMINATION, 125 ºC TEMPERATURE RISE RATING
  HITACH TYPE RJ T025B0750EC
  (BUSHING CURRENT TRANSFORMERS AS REQUIRED FOR THE WINDING TEMPERATURE INDICATING EQUIPMENT)
- NEUTRAL (H0): 25 KV CLASS, MINIMUM 150 KV BIL, 1,200 AMP
  HITACHI TYPE O+ C T025W0412AT
- CORE GROUNDS: 2.5 KV CLASS, 45 KV BIL, 100 AMP

INSULATING OIL:

- TYPE: NAPTHENIC BASE - ASTM D 3487 TYPE II; 0.3% BY MASS OF OXIDATION INHIBITOR

SEPARATE CONTROL AND POWER CABINETS:

- CABINET MATERIAL: WEATHER-PROOF TYPE 304 STAINLESS STEEL WITH LOCKING PROVISIONS. WINDOWS FOR VIEWING THE TEMPERATURE MONITOR AND ANNUNCIATOR IN CONTROL CABINET. SOLAR SHIELDING ON TOP, FRONT AND SIDE PANELS OF ENCLOSURES.
- GOVERNMENT-FURNISHED POWER: CONTROL POWER - 125 V DC; ANNUNCIATION POWER - 125 V DC; COOLING FANS - 480 V AC, 3-WIRE, 3-PHASE, 60 HZ
- WIRING: XLPE; 3-PHASE POWER CONDUCTORS COLOR CODED: PHASE A - BROWN; PHASE B - ORANGE; PHASE C - YELLOW; GROUNDED NEUTRAL - WHITE; INSULATED GROUND - GREEN/YELLOW
- CONDUIT: ALL WIRING TO BE RUN IN CONDUIT. WIRE RUNS THROUGH TANK REINFORCING CHANNELS NOT ALLOWED. ALL CONDUIT THREADED JOINTS SHALL HAVE A CONDUCTIVE JOINT COMPOUND APPLIED. OUTLET AND JUNCTION BOXES SHALL BE MALLEABLE CAST IRON WITH CAST COVERS AND LIQUID-TIGHT HUBS.
- TERMINAL BLOCKS: 600 V, 30 A MINIMUM, 90 ºC RATED TERMINATIONS.
- AUXILIARY RELAYS:
  - RATED FOR 125 V DC OR 120 V AC; MEETS REQUIREMENTS OF NEMA ICS5; 10 A CONTACTS
  - SINGLE-CONTACT INDUCTIVE LOAD INTERRUPTING CAPACITY: 125 V DC CIRCUITS - 1.0 A; 120 V AC CIRCUITS - 6.0 A
- SWITCHES:
  - RATED FOR 600 V AC OR 250 V DC
  - SINGLE-BREAK INDUCTIVE LOAD INTERRUPTING RATING: 125 V DC CIRCUITS - 1.5 A; 120 V AC CIRCUITS - 10 A
- MOLDED-CASE CIRCUIT BREAKERS:
  - 480 V AC CIRCUITS - RATED 600 V AC AND 35,000 A INTERRUPTING AT 480 VAC
  - 120 V AC CIRCUITS - RATED 250 V DC AND 120/240 OR 240 V AC, AND 10,000 A INTERRUPTING
  - 125 AND 250 V DC CIRCUITS - RATED 125/250 OR 250 V DC, AND 10,000 A INTERRUPTING
- SPECIAL FEATURES:
  - ALL CIRCUITS, WIRING AND EQUIPMENT RATED GREATER THAN 120 V AC TO BE MOUNTED IN POWER CABINET.
  - 120 V AC, 1,000 LUMEN LED TYPE A19 LAMPS WITH DOOR-ACTUATED SWITCH.
  - 120 V AC, 20 A HOSPITAL GRADE GFCI RECEPTACLE MOUNTED INSIDE THE CONTROL CABINET.
  - PTC RESISTOR DESIGN ENCLOSURE HEATERS WITH INTEGRAL FANS, AND INDUSTRIAL GRADE HUMIDISTAT / THERMOSTAT CONTROL.
  - FOLD-DOWN MAINTENANCE TRAY ON INSIDE OF CONTROL CABINET DOOR.
- NAMEPLATES: CAST BRONZE OR STAINLESS STEEL; IEEE C57.12.00, TABLE 7, INCLUDING MANUFACTURING DATE, PLANT LOCATION, GOVERNMENT CONTRACT NUMBER, PRESSURE AND VACUUM THE TANK WILL WITHSTAN, DRY WEIGHT OF THE INSULATION, AND CALCULATED X/R RATIO. AN ADDITIONAL DIAGRAM NAMEPLATE FOR SLING LOCATIONS AND LIFT POSITIONS SHALL ALSO BE PROVIDED. EQUIPMENT NAMEPLATES SHALL BE PROVIDED FOR THE HIGH-VOLTAGE BUSHINGS AND LOW-VOLTAGE BUSHINGS MADE OF STAINLESS STEEL WITH BLACK LETTERING. DEVICE NAMEPLATES WITHIN THE CONTROL AND POWER CABINETS SHALL BE ANODIZED ALUMINUM OR STAINLESS STEEL WITH ENGRAVED BLACK LETTERING.

FACTORY ASSEMBLY AND PAINT:

- ASSEMBLY: TRANSFORMER TO BE FULLY ASSEMBLED, WITH REMOVABLE COMPONENTS MATCH-MARKED FOR EASE OF REASSEMBLY.
- EXTERIOR PAINT: PRIMER COAT, EPOXY BASE COAT, POLYURETHANE TOP COAT - MUNSELL 5BG 7/0.4 HIGH-GLOSS (ANSI NO. 70 GRAY). CORROSION RESISTANT SURFACES, AND STAINLESS STEEL CABINETS, SHALL REMAIN UNPAINTED. COVER TO RECEIVE A NON-SLIP COATING.
- INTERIOR PAINT: PRIMER COAT, OIL-RESISTANT FINISH COAT - WHITE. ALLOW TO CURE FOR ONE WEEK PRIOR TO OIL FILLING.
- INSPECTIONS: GOVERNMENT INSPECTIONS PERFORMED DURING
  (1) DESIGN REVIEW MEETING
  (2) AFTER COMPLETION OF WINDINGS BUT PRIOR TO LANDING ON CORE
  (3) COMPLETED CORE/COIL ASSEMBLY, BUT PRIOR TO TANKING (IF PROVIDING A CORE TYPE TRANSFORMER)
  (4) COMPLETELY ASSEMBLED AND WITNESSING OF FACTORY ACCEPTANCE TESTS

FACTORY ACCEPTANCE TESTS (F.A.T.):

- ALL 'ROUTINE' TESTS (IEEE C57.12.00, TABLE 17)
- TEMPERATURE RISE TESTS SHALL BE PERFORMED AT EACH COOLING STAGE
- LIGHTNING IMPULSE TESTS
- AUDIBLE SOUND LEVEL TESTS SHALL BE PERFORMED
- INDUCED VOLTAGE TEST ACCEPTANCE CRITERIA: 7,200 CYCLE ENHANCEMENT LEVEL: 500 PC; ONE HOUR LEVEL: 300 PC
- LEAKAGE REACTANCE (WITH ELECTRONIC DATA FILES)
- SWEEP FREQUENCY RESPONSE ANALYSIS (WITH ELECTRONIC DATA FILES)
  - CABLE INTEGRITY TEST REQUIRED
  - ONE SFRA TEST TO BE PERFORMED WITH THE TRANSFORMER FULLY ASSEMBLED AND OIL FILLED
  - ONE SFRA TEST TO BE PERFORMED WITH THE TRANSFORMER IN THE SHIPPING CONFIGURATION
- DE-ENERGIZED TAP CHANGER MECHANICAL OPERATIONAL TEST (5 COMPLETE CYCLES)
- ALL ELECTRICAL AND ELECTO-MECHANICAL DEVICES SHALL BE FUNCTIONALLY TESTED
- EACH HIGH-VOLTAGE AND HIGH-VOLTAGE NEUTRAL BUSHING SHALL UNDERGO CAPACITANCE AND POWER FACTOR TESTS DURING TRANSFORMER F.A.T.
- BUSHING CURRENT TRANSFORMER ROUTINE TESTS
- ANALOG TEMPERATURE GAGE FUNCTIONAL VERIFICATION

SPARE PARTS:

- (QTY 1): COMPLETE GASKET SET
- (QTY 1): SET OF GASKETS FOR TRANSFORMER REASSEMBLY
- (QTY 1): RELAY AND CONTACTOR OF EACH TYPE AND RATING
- (QTY 1): PRESSURE RELIEF DEVICE
- (QTY 1): LIQUID LEVEL INDICATOR
- (QTY 1): WINDING TEMPERATURE INDICATOR
- (QTY 1): OIL TEMPERATURE INDICATOR
- (QTY 1): BUSHING CURRENT TRANSFORMER OF EACH TYPE AND RATING
- (QTY 2): COOLING FAN COMPLETE WITH MOTOR
- (QTY 1): CRATED RADIATOR
- (QTY 3): FIBER OPTIC EXTENSION CABLE THAT CONNECTS THE FEED-THROUGH WALL PLATE LEFT UNCONNECTED
- (QTY 1): FUSE OF EACH TYPE AND RATING
- (QTY 1): PRESSURE REGULATOR IF PROVIDING A NITROGEN GAS SYSTEM
- (QTY 1): VALVE OF EACH SIZE AND TYPE
- (QTY 1): ONE BUCHHOLZ RELAY IF PROVIDING A CONSERVATOR TANK SYSTEM

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MARK	DESCRIPTION	DATE
A	UPDATED MAX WEIGHT	APRIL 2026

DESIGNED BY: T. CASPER, P.E.
DRAWN BY: M. GUNDRUM
CHECKED BY: S. COTNER, P.E.
SUBMITTED BY: JORDAN S. TINNUS, P.E.
SIZE: ANSI D
ISSUE DATE: OCTOBER 2025
SOLICITATION NO.: W912EF26RA003
CONTRACT NO.:
FILE NUMBER: LGP-1-G-A-004
FILE NAME: LG503118_G-004dgn.dgn

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201 N 3RD AVE
WALLA WALLA, WASHINGTON

US ARMY CORPS OF ENGINEERS
HYDROELECTRIC DESIGN CENTER
333 SW 1ST AVE
PORTLAND, OREGON

LITTLE GOOSE LOCK AND DAM
LOWER SNAKE RIVER SPARE TRANSFORMERS
T2

TRANSFORMER REQUIREMENTS SUMMARY SHEET

SHEET ID
VOLUME 2
G-004

FINAL

DS: LG503118_G-004dgn.dgn
PD: 6:19:22 AM 4/21/2026

BILL OF MATERIALS

ITEM	QTY	SEGMENT	DESCRIPTION	EXAMPLE	MODEL NUMBER
1	1	COVER	HIGH-VOLTAGE (H1) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T550W2000VV
2	1	COVER	HIGH-VOLTAGE NEUTRAL (H0) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T025W0412AT
3	4	COVER	LOW-VOLTAGE BUSHINGS	ABB-HITACHI	TYPE RJ BUSHING T025B0750EC
7	AS DES.	COVER	CORE & CORE FRAME GROUND BUSHINGS (SEE DETAIL F15)		
8	AS DES.	1,4	RADIATOR (TYPICAL)		
10	AS DES.	2,4	HORIZONTAL DRAFT COOLING FANS	KRENZ-VENT	
15	1	1	DUAL TANK NITROGEN REGULATOR CABINET	ABB	RND2
16	1	3	CONTROL CABINET		
17	1	3	POWER CABINET		
18	1	3	OIL LEVEL INDICATOR	QUALITROL	SERIES 042
20	5	3	THERMOWELLS (QTY. 3 - STANDARD, QTY. 2 - HEATED)		
21	1	3	RAPID PRESSURE RISE RELAY AND 1.5-INCH ISOLATION VALVE	QUALITROL & MILWAUKEE VALVE	900-003-01 & F20SS, CLASS 150
25	1	4	3-INCH MAIN OIL DRAIN VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
26	1	4	1.5-INCH LOWER FILTER VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
27	1	2	1.5-INCH UPPER FILTER VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
28	1	COVER	3-INCH VACUUM VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
30	2	3	2-INCH GAS-IN-OIL MONITOR INTERFACE VALVES	MILWAUKEE VALVE	F20SS, CLASS 150
33	1	4, COVER	PRESSURE RELIEF DEVICE WITH DISCHARGE PIPING	QUALITROL	XPRD
35	AS DES.	COVER	MANHOLE ACCESS COVER		
45	AS DES.	COVER	FALL ARREST SYSTEM MOUNTING BRACKETS	DBI-SALA	8517412
72	2	1	STABALIZING EYES		
73	3	1, 3	COMBINATION JACKING PAD, PULLING EYE AND LIFTING EYES		
74	1	3	COMBINATION UPRIGHTING AND LIFTING EYES FOR UPRIGHTING AND LIFTING COMPLETE UNIT		
77	1	3	EXTERNAL GAS EXPANSION TANK		

GENERAL NOTES

1. THE TRANSFORMER LAYOUT AND LIMITING DIMENSIONS HAVE BEEN PROVIDED FOR THE MANUFACTURER'S USE IN DESIGNING THE TRANSFORMER FOR PROPER INTERCONNECTION TO THE EXISTING EQUIPMENT AND INTERFACES IN THE TRANSFORMER VAULT. THE LOCATIONS OF THE FOLLOWING TRANSFORMER EQUIPMENT ARE CONSIDERED CRITICAL TO ASSURE PROPER INTERCONNECTION:

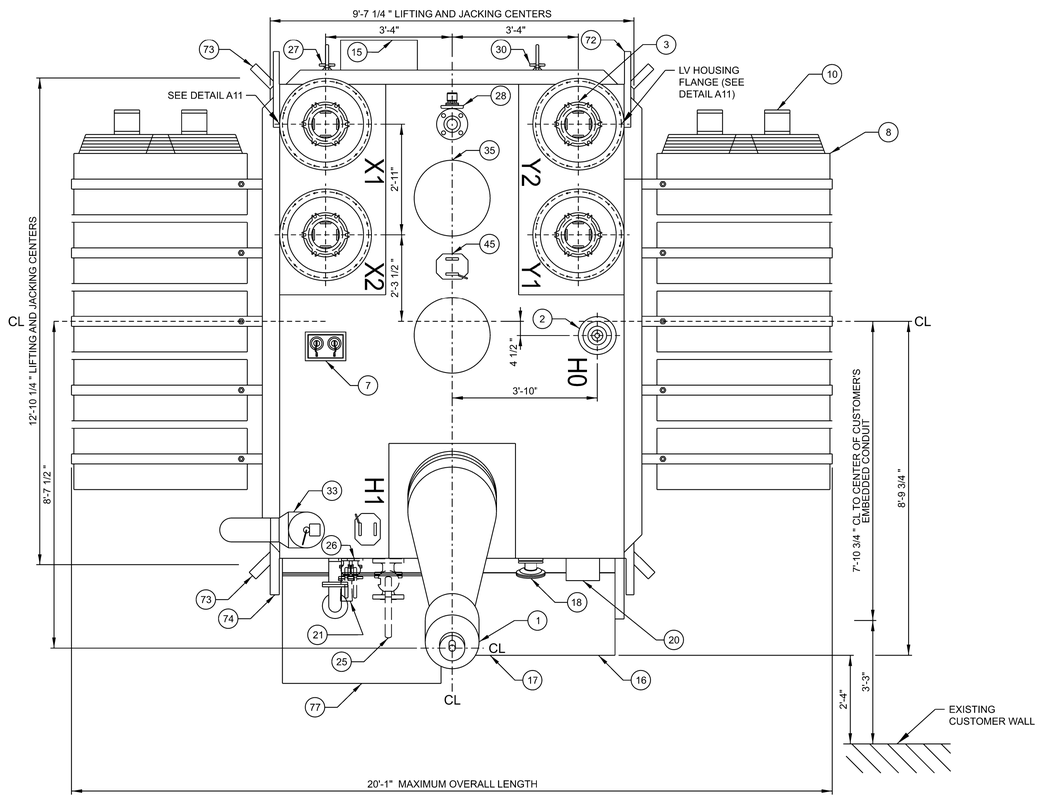
   A. HIGH-VOLTAGE BUSHING LOCATION AND TERMINAL CONNECTION
   B. LOW-VOLTAGE BUSHINGS LOCATIONS AND TERMINAL CONNECTIONS
   C. HIGH-VOLTAGE NEUTRAL BUSHING LOCATION AND TERMINAL CONNECTION
   D. LOW-VOLTAGE BUSHING HOUSING FLANGE DIMENSION AND LOCATION
   E. CONTROL AND POWER CABINETS
   F. ANCILLARY DEVICES
   G. JACKING & LIFTING FACILITIES
   H. STRUCTURAL BASE
   I. MAXIMUM OVERALL WIDTH
   J. MAXIMUM OVERALL LENGTH

2. THE DRAWING SHOWN IS BASED ON THE WESTINGHOUSE SHELL-FORM DRAWINGS WITH AN INERT-GAS OIL PRESERVATION SYSTEM. IF A CORE-FORM TRANSFORMER AND/OR A CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, THE DIMENSIONAL REQUIREMENTS IDENTIFIED MUST BE MET. THE COPS TANK MUST MAINTAIN A MINIMUM OF 105" CLEARANCE FROM THE OVERHEAD 500KV CONDUCTORS PER IEEE STD 1427. THERE SHALL BE NO MODIFICATIONS TO THE POWERHOUSE EQUIPMENT NEEDED TO FIT THE COPS TANK. IF CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, ALL ASSOCIATED EQUIPMENT REQUIRED IN SECTION 48 19 23.04 26 FOR A CONSTANT OIL PRESERVATION SYSTEM MUST BE INCLUDED, SUCH AS A MAINTENACE-FREE DEHYDRATING BREATHER, AND BUCHHOLZ RELAY.

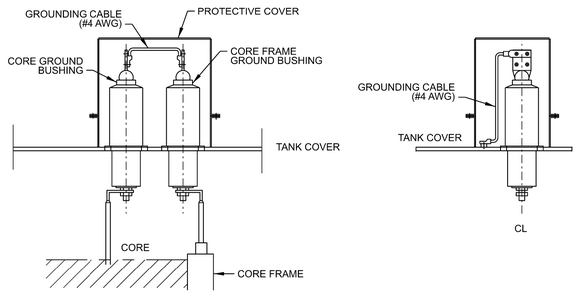
3. THE RADIATORS AS DEPICTED INDICATE THE PERMISSIBLE LOCATIONS, AND ARE NOT INTENDED TO INDICATE THE ACTUAL QUANTITY.

4. MAXIMUM WEIGHT: 360,000 POUNDS (A)

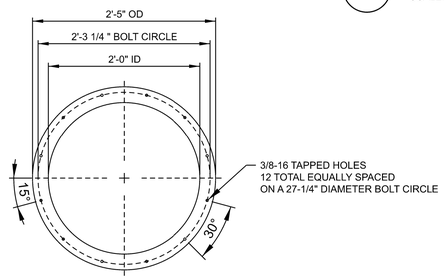
5. SEE RESOURCE DRAWINGS FOR PAD DETAILS



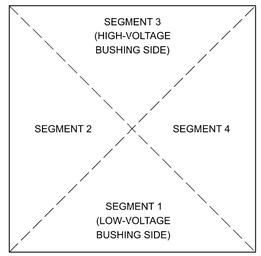
A2 TRANSFORMER PLAN VIEW - COVER
SCALE: 1/2"=1'-0"



F15 CORE AND CORE FRAME GROUNDING
SCALE: NTS



A11 LOW-VOLTAGE BUSHING HOUSING FLANGE DETAILS
SCALE: NTS



A16 TRANSFORMER TANK SEGMENT IDENTIFICATION (TOP VIEW)
SCALE: NTS

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MARK	DESCRIPTION	DATE
A	UPDATED MAX WEIGHT	APRIL 2026

ISSUE DATE: OCTOBER 2025
SOLICITATION NO.: W912EF26RA003
CONTRACT NO.:
FILE NUMBER: LGP-1-6-1A001
JORDAN S. FINK, P.E.
FILE NAME: LG503118_E-101.dgn
ANSI D

DESIGNED BY: P. KLEINE, P.E
DRAWN BY: M. GUNDRUM
CHECKED BY: S. COTNER, P.E.
SUBMITTED BY:

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PORTLAND, OREGON

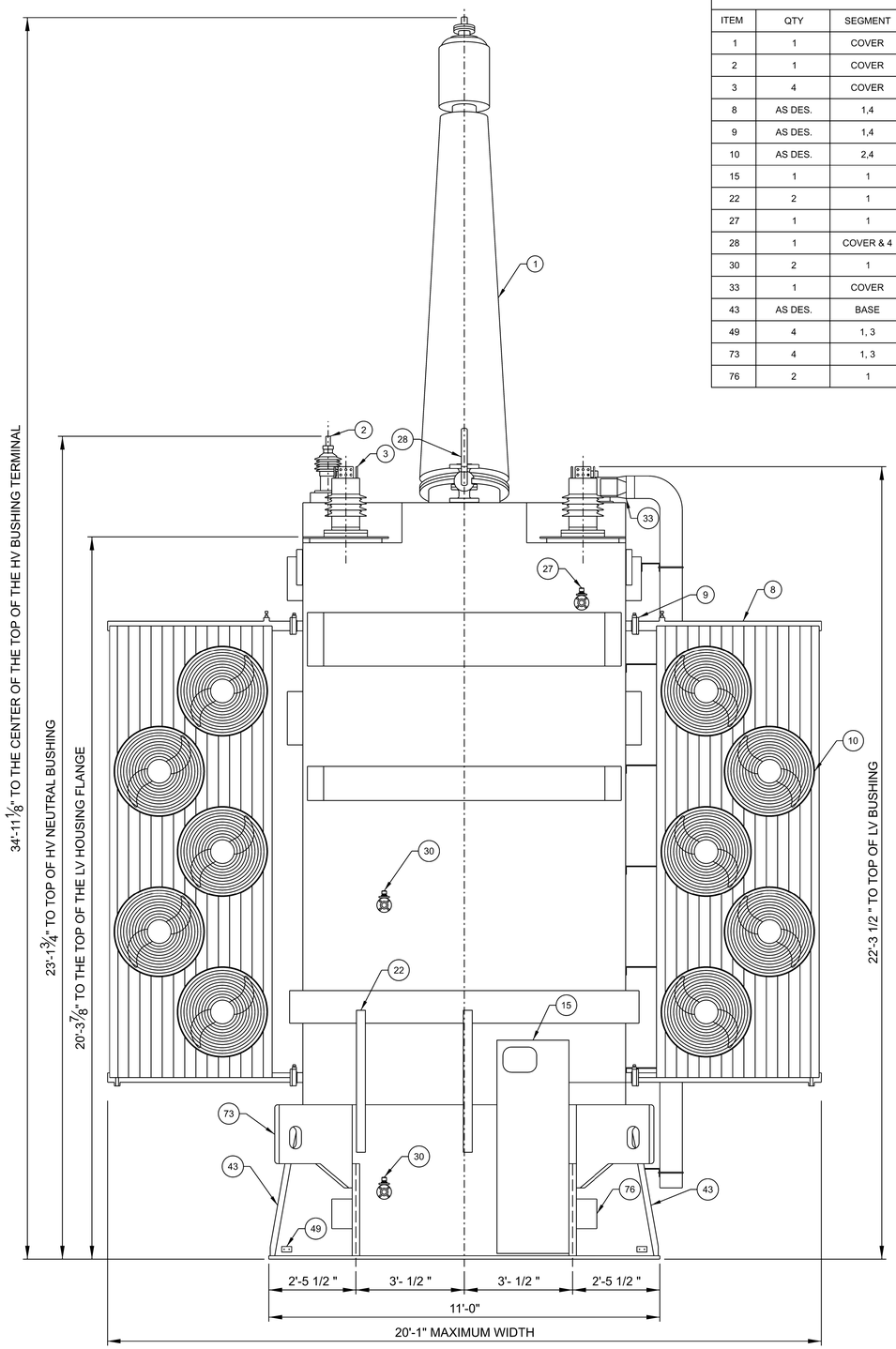
LITTLE GOOSE LOCK AND DAM
LOWER SNAKE RIVER SPARE TRANSFORMERS
T2

GSU TRANSFORMER
LAYOUT AND LIMITING DIMENSIONS
COVER, INSTALL

SHEET ID
VOLUME 2
E-101

FINAL

DS: LG503118_E-101.dgn
PD: 6:40:44 AM 4/21/2026



3 TRANSFORMER ELEVATION VIEW - SEGMENT 1

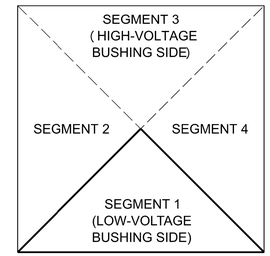
SCALE: 1/2"=1'-0"

BILL OF MATERIALS

ITEM	QTY	SEGMENT	DESCRIPTION	EXAMPLE	MODEL NUMBER
1	1	COVER	HIGH-VOLTAGE (H1) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T550W2000VV
2	1	COVER	HIGH-VOLTAGE NEUTRAL (H0) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T025W0412AT
3	4	COVER	LOW-VOLTAGE BUSHINGS	ABB-HITACHI	TYPE RJ BUSHING T025B0750EC
8	AS DES.	1,4	RADIATORS (TYPICAL)		
9	AS DES.	1,4	RADIATOR ISOLATION VALVES (TYPICAL)		
10	AS DES.	2,4	HORIZONTAL DRAFT COOLING FAN (TYPICAL)	KRENZ-VENT	
15	1	1	DUAL TANK NITROGEN REGULATOR CABINET	ABB	RND2
22	2	1	MOUNTING BRACKETS FOR FUTURE ON-LINE DGA		
27	1	1	1.5-INCH UPPER FILTER VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
28	1	COVER & 4	3-INCH VACUUM VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
30	2	1	2-INCH GAS-IN-OIL MONITOR INTERFACE VALVES	MILWAUKEE VALVE	F20SS, CLASS 150
33	1	COVER	PRESSURE RELIEF DEVICE WITH DISCHARGE PIPING		
43	AS DES.	BASE	STRUCTURAL BASE		
49	4	1, 3	GROUNDING PADS (TYPICAL)		
73	4	1, 3	COMBINATION JACKING PAD, PULLING EYE AND LIFTING EYES		
76	2	1	COMBINATION ROCKER AND JACKING PADS		

GENERAL NOTES

1. THE TRANSFORMER LAYOUT AND LIMITING DIMENSIONS HAVE BEEN PROVIDED FOR THE MANUFACTURER'S USE IN DESIGNING THE TRANSFORMER FOR PROPER INTERCONNECTION TO THE EXISTING EQUIPMENT AND INTERFACES IN THE TRANSFORMER VAULT. THE LOCATIONS OF THE FOLLOWING TRANSFORMER EQUIPMENT ARE CONSIDERED CRITICAL TO ASSURE PROPER INTERCONNECTION:
   A. HIGH-VOLTAGE BUSHING LOCATION AND TERMINAL CONNECTION
   B. HIGH-VOLTAGE NEUTRAL BUSHING LOCATION AND TERMINAL CONNECTION
   C. LOW-VOLTAGE BUSHINGS LOCATIONS AND TERMINAL CONNECTIONS
   D. LOW VOLTAGE BUSHING HOUSING FLANGE DIMENSIONS AND LOCATION
   E. CONTROL AND POWER CABINETS
   F. ANCILLARY DEVICES
   G. JACKING & LIFTING FACILITIES
   H. STRUCTURAL BASE
   I. MAXIMUM OVERALL WIDTH
2. THE DRAWING SHOWN IS BASED ON THE WESTINGHOUSE SHELL-FORM DRAWINGS WITH AN INERT-GAS OIL PRESERVATION SYSTEM. IF A CORE-FORM TRANSFORMER AND/OR A CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, THE DIMENSIONAL REQUIREMENTS IDENTIFIED MUST BE MET. THE COPS TANK MUST MAINTAIN A MINIMUM OF 105" CLEARANCE FROM THE OVERHEAD 500KV CONDUCTORS PER IEEE STD 1427. THERE SHALL BE NO MODIFICATIONS TO THE POWERHOUSE EQUIPMENT NEEDED TO FIT THE COPS TANK. IF CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, ALL ASSOCIATED EQUIPMENT REQUIRED IN SECTION 48 19 23.04 26 FOR A CONSTANT OIL PRESERVATION SYSTEM MUST BE INCLUDED, SUCH AS A MAINTENACE-FREE DEHYDRATING BREATHER, AND BUCHHOLZ RELAY.
3. THE RADIATORS AS DEPICTED INDICATE THE PERMISSIBLE LOCATIONS, AND ARE NOT INTENDED TO INDICATE THE ACTUAL QUANTITY.
4. MAXIMUM WEIGHT: 360,000 POUNDS (A)
5. SEE RESOURCE DRAWINGS FOR PAD DETAILS.



A17 TRANSFORMER TANK SEGMENT IDENTIFICATION (TOP VIEW)

SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
A	UPDATED MAX WEIGHT	APRIL 2026

ISSUE DATE: OCTOBER 2025
SOLICITATION NO.: W912EF26RA003
CONTRACT NO.:

DESIGNED BY: P. KLEINE, P.E.
DRAWN BY: M. GUNDRUM
CHECKED BY: S. COTNER, P.E.
SUBMITTED BY: JORDAN S. PINK, P.E.
SIZE: ANSI D
FILE NUMBER: LGP-1-6-1A402
FILE NAME: LG503118_E-102.dgn

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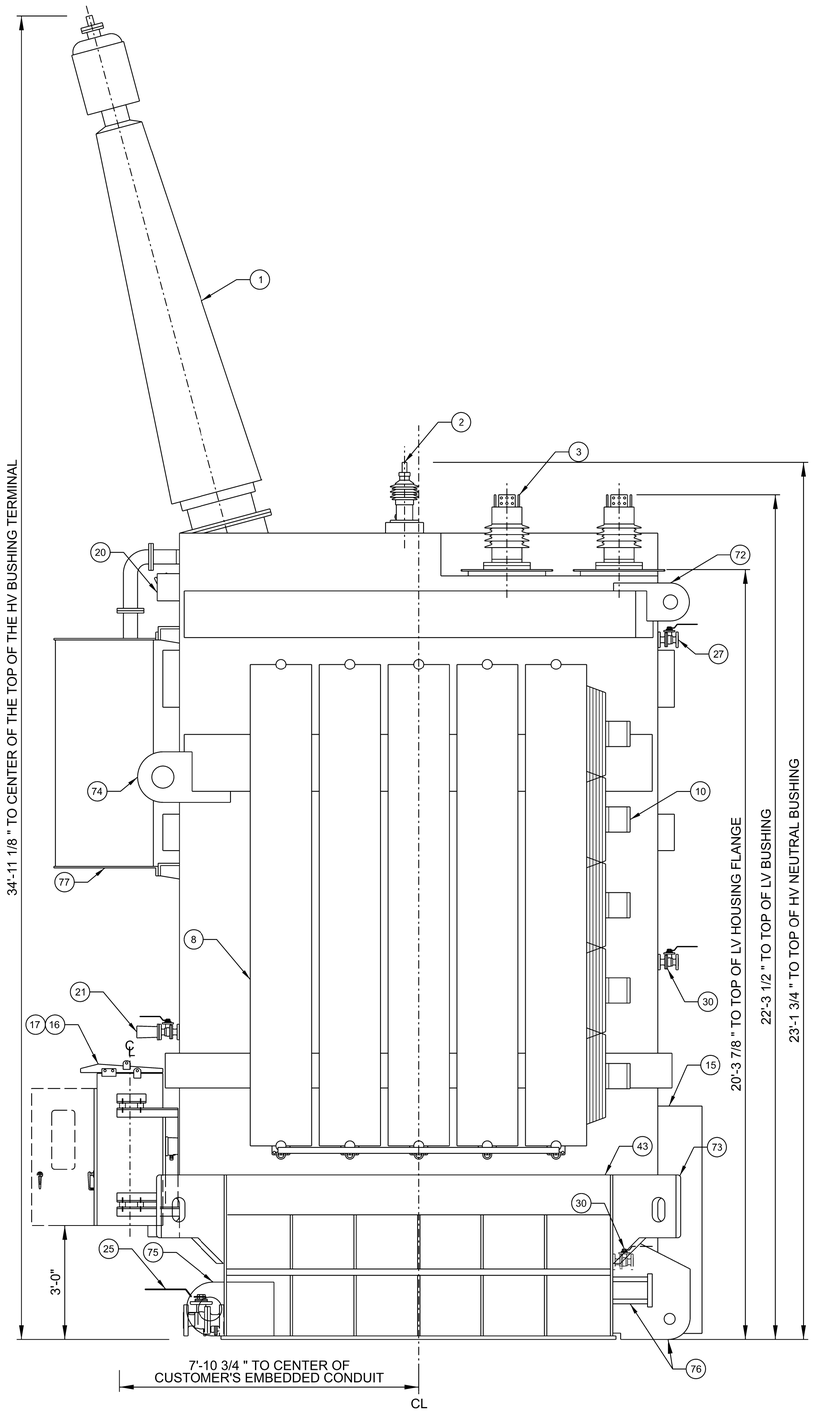
LITTLE GOOSE LOCK AND DAM
LOWER SNAKE RIVER SPARE TRANSFORMERS
I2

GSU TRANSFORMER
LAYOUT AND LIMITING DIMENSIONS
SEGMENT 1, INSTALL

SHEET ID
VOLUME 2
E-102

FINAL

DS: LG503118_E-102.dgn
PD: 6:56:03 AM 4/21/2026



A2 TRANSFORMER ELEVATION - SEGMENT 2
SCALE: 1/2"=1'-0"

GENERAL NOTES

1. THE TRANSFORMER LAYOUT AND LIMITING DIMENSIONS HAVE BEEN PROVIDED FOR THE MANUFACTURER'S USE IN DESIGNING THE TRANSFORMERS FOR PROPER INTERCONNECTION TO THE EXISTING EQUIPMENT AND INTERFACES IN THE TRANSFORMER VAULT. THE LOCATIONS OF THE FOLLOWING TRANSFORMER EQUIPMENT ARE CONSIDERED CRITICAL TO ASSURE PROPER INTERCONNECTION:

   A. HIGH-VOLTAGE BUSHING LOCATION AND TERMINAL CONNECTION
   B. LOW-VOLTAGE BUSHING LOCATIONS AND TERMINAL CONNECTIONS
   C. HIGH-VOLTAGE NEUTRAL BUSHING LOCATION AND TERMINAL CONNECTION
   D. LOW-VOLTAGE BUSHING HOUSINGS FLANGE LOCATION AND DIMENSIONS
   E. CONTROL AND POWER CABINETS
   F. ANCILLARY DEVICES
   G. JACKING & LIFTING FACILITIES
   H. STRUCTURAL BASE
   H. MAXIMUM OVERALL LENGTH
   I. LOCATION OF EXISTING EMBEDDED CONDUIT COMPARED TO THE CONTROL AND POWER CABINET

2. THE DRAWING SHOWN IS BASED ON THE WESTINGHOUSE SHELL-FORM DRAWINGS WITH AN INERT-GAS OIL PRESERVATION SYSTEM. IF A CORE-FORM TRANSFORMER AND/OR A CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, THE DIMENSIONAL REQUIREMENTS IDENTIFIED MUST BE MET. THE COPS TANK MUST MAINTAIN A MINIMUM OF 105" CLEARANCE FROM THE OVERHEAD 500KV CONDUCTORS PER IEEE STD 1427. THERE SHALL BE NO MODIFICATIONS TO THE POWERHOUSE EQUIPMENT NEEDED TO FIT THE COPS TANK. IF CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, ALL ASSOCIATED EQUIPMENT REQUIRED IN SECTION 48 19 23.04 26 FOR A CONSTANT OIL PRESERVATION SYSTEM MUST BE INCLUDED, SUCH AS A MAINTENACE-FREE DEHYDRATING BREATHER, AND BUCHHOLZ RELAY.

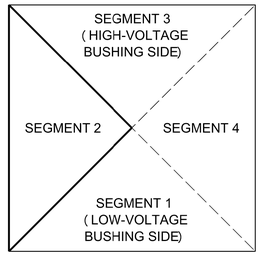
3. THE RADIATORS AS DEPICTED INDICATE THE PERMISSIBLE LOCATIONS, AND ARE NOT INTENDED TO INDICATE THE ACTUAL QUANTITY.

4. MAXIMUM WEIGHT: 360,000 POUNDS (A)

5. SEE RESOURCE DRAWINGS FOR PAD DETAILS

BILL OF MATERIALS

ITEM	QTY	SEGMENT	DESCRIPTION	EXAMPLE	MODEL NUMBER
1	1	COVER	HIGH-VOLTAGE (H1) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T550W2000VV
2	1	COVER	HIGH-VOLTAGE NEUTRAL (H0) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T025W0412AT
3	4	COVER	LOW-VOLTAGE BUSHINGS	ABB-HITACHI	TYPE RJ BUSHING T025B0750EC
8	AS DES	2,4	RADIATORS (TYPICAL)		
10	AS DES	COVER	HORIZONTAL DRAFT COOLING FANS (TYPICAL)	KRENZ-VENT	
15	1	1	DUAL TANK NITROGEN REGULATOR CABINET	ABB	RND2
16	1	3	CONTROL CABINET		
17	1	3	POWER CABINET		
20	5	3	THERMOWELLS (QTY 3 - STANDARD, QTY 2 - HEATED)		
21	1	3	RAPID PRESSURE RISE RELAY	QUALITROL	900-003-01
25	1	3	3-INCH DRAIN VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
27	1	1	1.5-INCH UPPER FILTER VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
30	2	3	2-INCH DISSOLVED GAS-IN-OIL MONITOR INTERFACE VALVES	MILWAUKEE VALVE	F20SS, CLASS 150
43	AS DES	BASE	STRUCTURAL BASE		
72	2	1	STABALIZING EYES		
73	4	1, 3	COMBINATION JACKING PAD, PULLING EYE, AND LIFTING EYES		
74	2	3	COMBINATION UPRIGHTING AND LIFTING EYES FOR UPRIGHTING AND LIFTING COMPLETE UNIT		
75	2	3	HORIZONTAL LIFTING EYES FOR LIFTING COMPLETE UNIT WHEN IN HORIZONTAL POSITION		
76	2	1	COMBINATION ROCKER AND JACKING PADS FOR UPRIGHTING AND JACKING THE COMPLETE UNIT		
77	1	3	EXTERNAL GAS EXPANSION TANK		



A13 FIGURE 1 - TRANSFORMER TANK SEGMENT IDENTIFICATION (TOP VIEW)
SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
A	UPDATED MAX WEIGHT	APRIL 2026

DESIGNED BY: P. KLEINE, P.E.
DRAWN BY: M. GUNDRUM
CHECKED BY: S. COTNER, P.E.
SUBMITTED BY: JORDAN S. FINLAY
ANSI D

ISSUE DATE: OCTOBER 2025
SOLICITATION NO.: W912EF26RA003
CONTRACT NO.:
FILE NUMBER: LGP-1-6-14403
FILE NAME: LG503118_E-103.dgn

U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
201 N 3RD AVE
WALLA WALLA, WASHINGTON

US ARMY CORPS OF ENGINEERS
HYDROELECTRIC DESIGN CENTER
333 SW 1ST AVE
PORTLAND, OREGON

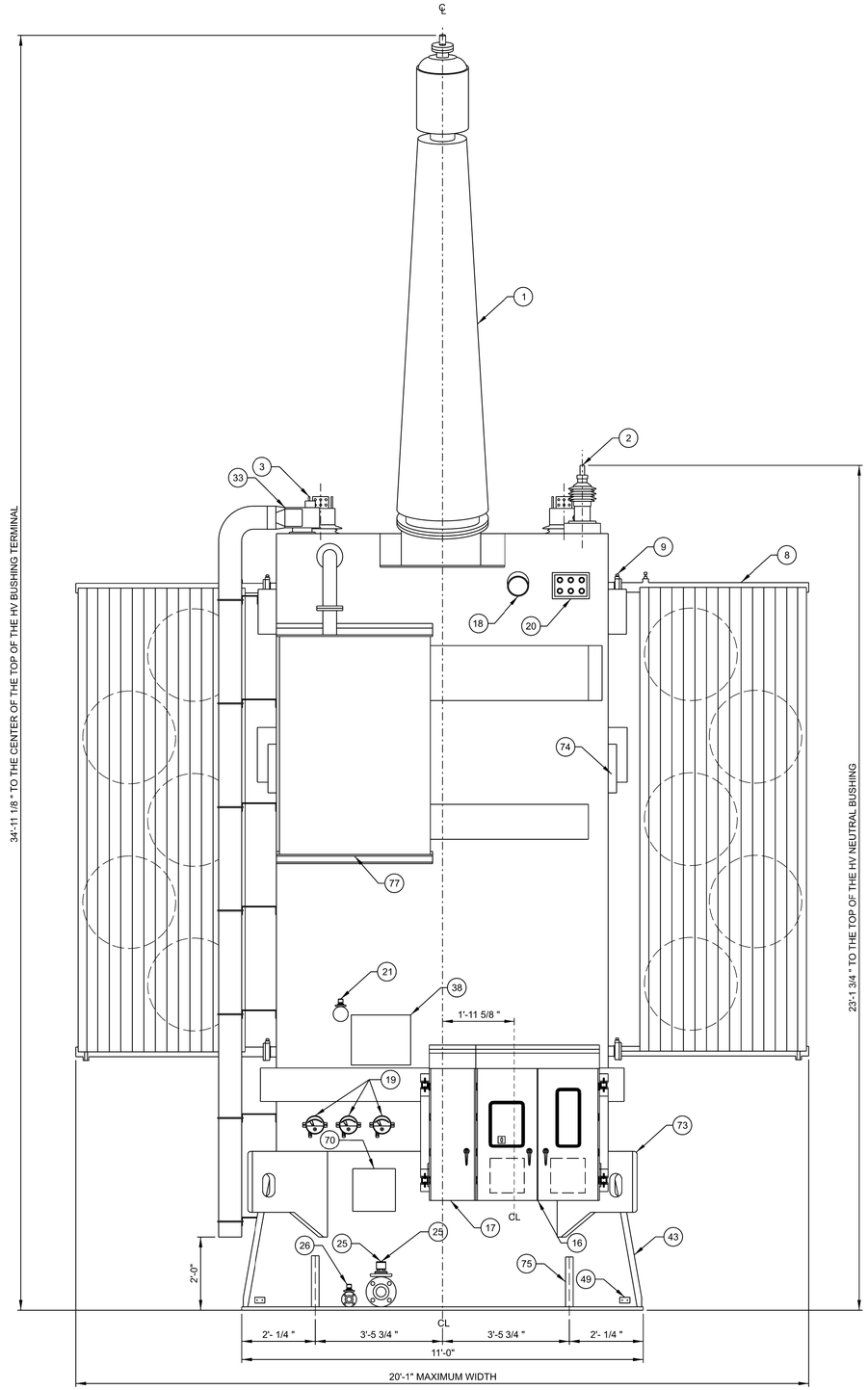
LITTLE GOOSE LOCK AND DAM
LOWER SNAKE RIVER SPARE TRANSFORMERS
T2

GSU TRANSFORMER
LAYOUT AND LIMITING DIMENSIONS
SEGMENT 2, INSTALL

SHEET ID
VOLUME 2
E-103

FINAL

DS: LG503118_E-103.dgn
PD: 7:08:59 AM 4/21/2026



A2 TRANSFORMER ELEVATION VIEW - SEGMENT 3

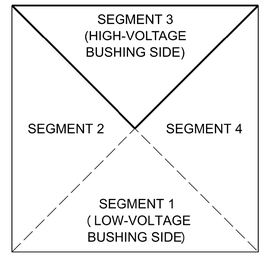
SCALE: 1/2"=1'-0"

GENERAL NOTES

1. THE TRANSFORMER LAYOUT AND LIMITING DIMENSIONS HAVE BEEN PROVIDED FOR THE MANUFACTURER'S USE IN DESIGNING THE TRANSFORMER FOR PROPER INTERCONNECTION TO THE EXISTING EQUIPMENT AND INTERFACES IN THE TRANSFORMER VAULT. THE LOCATIONS OF THE FOLLOWING TRANSFORMER EQUIPMENT ARE CONSIDERED CRITICAL TO ASSURE PROPER INTERCONNECTION:
   - A. HIGH-VOLTAGE BUSHING LOCATION AND TERMINAL CONNECTION
   - B. LOW-VOLTAGE BUSHING LOCATIONS AND TERMINAL CONNECTIONS
   - C. HIGH-VOLTAGE NEUTRAL BUSHING LOCATION AND TERMINAL CONNECTION
   - D. LOW-VOLTAGE BUSHING HOUSING DIMENSIONS AND LOCATION OF LOW VOLTAGE BUS
   - E. CONTROL AND POWER CABINETS
   - F. ANCILLARY DEVICES
   - G. JACKING FACILITIES
   - H. STRUCTURAL BASE INCLUDING WIDTH
   - I. MAXIMUM OVERAL WIDTH
2. THE DRAWING SHOWN IS BASED ON THE WESTINGHOUSE SHELL-FORM DRAWINGS WITH AN INERT-GAS OIL PRESERVATION SYSTEM. IF A CORE-FORM TRANSFORMER AND/OR A CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, THE DIMENSIONAL REQUIREMENTS IDENTIFIED MUST BE MET. THE COPS TANK MUST MAINTAIN A MINIMUM OF 105" CLEARANCE FROM THE OVERHEAD 500KV CONDUCTORS PER IEEE STD 1427. THERE SHALL BE NO MODIFICATIONS TO THE POWERHOUSE EQUIPMENT NEEDED TO FIT THE COPS TANK. IF CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, ALL ASSOCIATED EQUIPMENT REQUIRED IN SECTION 48 19 23.08 26 FOR A CONSTANT OIL PRESERVATION SYSTEM MUST BE INCLUDED, SUCH AS A MAINTENACE-FREE DEHYDRATING BREATHER, AND BUCHHOLZ RELAY.
3. THE RADIATORS AS DEPICTED INDICATE THE PERMISSIBLE LOCATIONS, AND ARE NOT INTENDED TO INDICATE THE ACTUAL QUANTITY.
4. MAXIMUM WEIGHT: 360,000 POUNDS (A)
5. SEE RESOURCE DRAWINGS FOR THE MOUNTING PAD DETAILS

BILL OF MATERIALS

ITEM	QTY	SEGMENT	DESCRIPTION	EXAMPLE	MODEL NUMBER
1	1	COVER	HIGH-VOLTAGE (H1) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T550W2000VV
2	1	COVER	HIGH-VOLTAGE NEUTRAL (H0) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T025W0412AT
3	4	COVER	LOW-VOLTAGE BUSHINGS	ABB-HITACHI	TYPE RJ BUSHING T025B0750EC
8	AS DES.	2,4	RADIATORS (TYPICAL)		
9	AS DES.	2,4	RADIATOR ISOLATION VALVES (TYPICAL)		
16	1	3	CONTROL CABINET		
17	1	3	POWER CABINET		
18	1	3	OIL LEVEL INDICATOR	QUALITROL	SERIES 042
19	3	3	ANALOG TEMPERATURE GAUGES	QUALITROL	
20	5	3	THERMOWELLS (QTY. 3 - STANDARD, QTY. 2 - HEATED)		
21	1	3	RAPID PRESSURE RISE RELAY	QUALITROL	900-003-01
25	1	3	3-INCH MAIN OIL DRAIN VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
26	1	3	1.5-INCH LOWER FILTER VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
33	1	4, COVER	PRESSURE RELIEF DEVICE WITH DISCHARGE PIPING	MILWAUKEE VALVE	XPRD
38	1	3	TRANSFORMER NAMEPLATE		
43	AS DES.	BASE	SKID-TYPE STRUCTURAL BASE		
49	4	1, 3	GROUNDING PADS (TYPICAL)		
70	1	3	AUXILIARY POWER TRANSFORMER		
73	4	1, 3	COMBINATION JACKING PAD, PULLING EYE AND LIFTING EYES		
74	2	3	COMBINATION UPRIGHTING AND LIFTING EYES FOR UPRIGHTING AND LIFTING COMPLETE UNIT		
75	2	3	HORIZONTAL LIFTING EYES FOR LIFTING COMPLETE UNIT WHEN IN HORIZONTAL POSITION		
77	1	3	EXTERNAL GAS EXPANSION TANK		



A16 FIGURE 1 - TRANSFORMER TANK SEGMENT IDENTIFICATION (TOP VIEW)

SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
A	UPDATED MAX WEIGHT	APRIL 2026

DESIGNED BY: P. KLEINE, P.E.
DRAWN BY: M. GUNDRUM
CHECKED BY: S. COTNER, P.E.
SUBMITTED BY: JORDAN S. FINK, P.E.
ANSI D
ISSUE DATE: OCTOBER 2025
SOLICITATION NO.: W912EP26RA003
CONTRACT NO.:
FILE NUMBER: LGP-1-6-1A4014
SIZE: FILENAME: LG503118_E-104.dgn

U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
201 N 3RD AVE
WALLA WALLA, WASHINGTON

US ARMY CORPS OF ENGINEERS
HYDROELECTRIC DESIGN CENTER
333 SW 1ST AVE
PORTLAND, OREGON

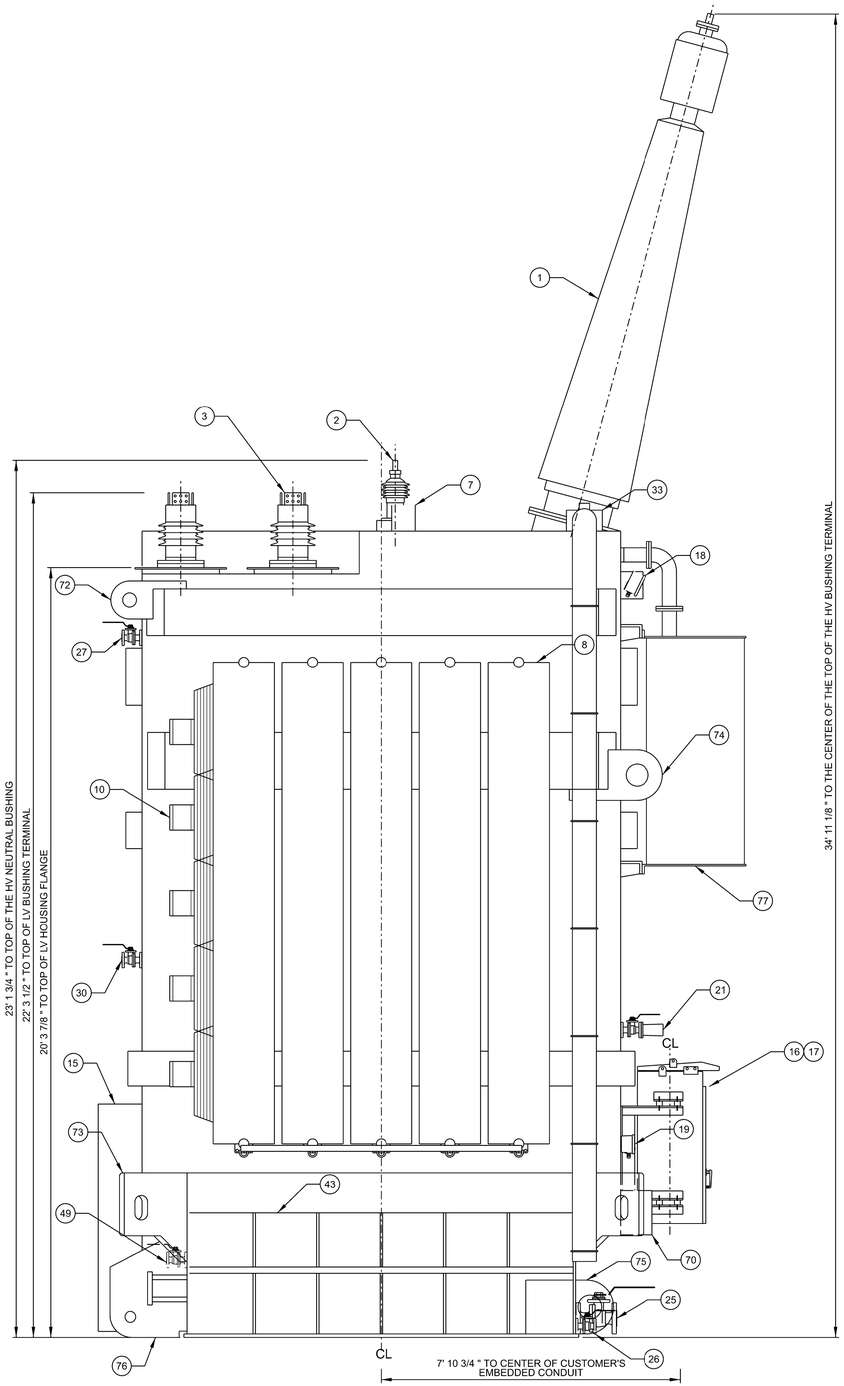
LITTLE GOOSE LOCK AND DAM
LOWER SNAKE RIVER SPARE TRANSFORMERS
T2

GSU TRANSFORMER
LAYOUT AND LIMITING DIMENSIONS
SEGMENT 3, INSTALL

SHEET ID
VOLUME 2
E-104

FINAL

DS: LG503118_E-104.dgn
PD: 7:39:31 AM 4/21/2026



A1 TRANSFORMER ELEVATION VIEW - SEGMENT 4

SCALE: 1/2"=1'-0"

GENERAL NOTES

1. THE TRANSFORMER LAYOUT AND LIMITING DIMENSIONS HAVE BEEN PROVIDED FOR THE MANUFACTURER'S USE IN DESIGNING THE TRANSFORMER FOR PROPER INTERCONNECTION TO THE EXISTING EQUIPMENT AND INTERFACES IN THE TRANSFORMER VAULT. THE LOCATIONS OF THE FOLLOWING TRANSFORMER EQUIPMENT ARE CONSIDERED CRITICAL TO ASSURE PROPER INTERCONNECTION:

   A. HIGH-VOLTAGE BUSHING LOCATION AND TERMINAL CONNECTION
   B. HIGH-VOLTAGE NEUTRAL BUSHING LOCATION AND TERMINAL CONNECTION
   C. LOW-VOLTAGE BUSHINGS LOCATIONS AND TERMINAL CONNECTIONS
   D. LOW VOLTAGE BUSHING HOUSING FLANGE DIMENSIONS AND LOCATION
   E. CONTROL AND POWER CABINETS
   F. ANCILLARY DEVICES
   G. JACKING & LIFTING FACILITIES
   H. STRUCTURAL BASE
   I. MAXIMUM OVERALL LENGTH
   J. LOCATION OF EMBEDDED CONDUIT

2. THE DRAWING SHOWN IS BASED ON THE WESTINGHOUSE SHELL-FORM DRAWINGS WITH AN INERT-GAS OIL PRESERVATION SYSTEM. IF A CORE-FORM TRANSFORMER AND/OR A CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, THE DIMENSIONAL REQUIREMENTS IDENTIFIED MUST BE MET. THE COPS TANK MUST MAINTAIN A MINIMUM OF 105" CLEARANCE FROM THE OVERHEAD 500KV CONDUCTORS PER IEEE STD 1427. THERE SHALL BE NO MODIFICATIONS TO THE POWERHOUSE EQUIPMENT NEEDED TO FIT THE COPS TANK. IF CONSTANT OIL PRESERVATION SYSTEM IS PROVIDED, ALL ASSOCIATED EQUIPMENT REQUIRED IN SECTION 48 19 23.04 26 FOR A CONSTANT OIL PRESERVATION SYSTEM MUST BE INCLUDED, SUCH AS A MAINTENACE-FREE DEHYDRATING BREATHER, AND BUCHHOLZ RELAY.

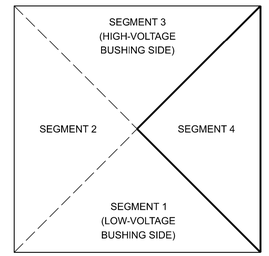
3. THE RADIATORS AS DEPICTED INDICATE THE PERMISSIBLE LOCATIONS, AND ARE NOT INTENDED TO INDICATE THE ACTUAL QUANTITY.

4. MAXIMUM WEIGHT: 360,000 POUNDS (A)

5. SEE RESOURCE DRAWINGS FOR PAD DETAILS.

BILL OF MATERIALS

ITEM	QTY	SEGMENT	DESCRIPTION	EXAMPLE	MODEL NUMBER
1	1	COVER	HIGH-VOLTAGE (H1) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T550W2000VV
2	1	COVER	HIGH-VOLTAGE NEUTRAL (H0) BUSHING	ABB-HITACHI	TYPE O+ C BUSHING T025W0412AT
3	4	COVER	LOW-VOLTAGE BUSHINGS	ABB-HITACHI	TYPE RJ BUSHING T025B0750EC
7	AS DES.	COVER	CORE & CORE FRAME GROUND BUSHINGS		
8	AS DES.	2,4	RADIATORS (TYPICAL)		
10	AS DES.	COVER	HORIZONTAL DRAFT COOLING FANS (TYPICAL)	KRENZ-VENT	
15	1	1	DUAL TANK NITROGEN REGULATOR CABINET	ABB	RND2
16	1	3	CONTROL CABINET		
17	1	3	POWER CABINET		
18	1	3	OIL LEVEL INDICATOR	QUALITROL	SERIES 042
19	1	3	ANALOG TEMPERATURE GAUGES	QUALITROL	TR6000 SERIES
21	1	3	RAPID PRESSURE RISE RELAY	QUALITROL	900-003-01
25	1	3	3-INCH MAIN OIL DRAIN VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
26	1	3	2-INCH DISSOLVED GAS-IN-OIL MONITOR INTERFACE VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
27	1	1	1.5-INCH LOWER FILTER VALVE	MILWAUKEE VALVE	F20SS, CLASS 150
30	2	3	2-INCH DISSOLVED GAS-IN-OIL MONITOR INTERFACE VALVES	MILWAUKEE VALVE	F20SS, CLASS 150
33	1	4,COVER	PRESSURE RELIEF DEVICE WITH DISCHARGE PIPING	QUALITROL	XPRD
43	AS DES.	BASE	STRUCTURAL BASE		
49	4	2,4	GROUNDING PAD (TYPICAL)		
70	1	3	AUXILIARY POWER TRANSFORMER		
72	2	1	STABILIZING EYES		
73	4	1, 3	COMBINATION JACKING PAD, PULLING EYE, AND LIFTING EYES		
74	2	3	COMBINATION UPRIGHTING AND LIFTING EYES FOR UPRIGHTING AND LIFTING COMPLETE UNIT		
75	2	3	HORIZONTAL LIFTING EYES FOR LIFTING COMPLETE UNIT WHEN IN HORIZONTAL POSITION		
76	2	1	COMBINATION ROCKER AND JACKING PADS FOR UPRIGHTING AND JACKING COMPLETE UNIT		
77	1	3	EXTERNAL GAS EXPANSION TANK		



A16 FIGURE 1 - TRANSFORMER TANK SEGMENT IDENTIFICATION (TOP VIEW)

SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
A	UPDATED MAX WEIGHT	APRIL 2026

DESIGNED BY: P. KLEINE, P.E
DRAWN BY: M. GUNDRUM
CHECKED BY: S. COTNER, P.E.
SUBMITTED BY: JORDAN S. FINK, P.E.
SIZE: ANSI D
ISSUE DATE: OCTOBER 2025
SOLICITATION NO.: W912EF26RA003
CONTRACT NO.:
FILE NUMBER: LGP-1-6-14405
FILENAME: LG503118_E-105.dgn

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LOWER SNAKE RIVER SPARE TRANSFORMERS
T2

GSU TRANSFORMER
LAYOUT AND LIMITING DIMENSIONS
SEGMENT 4, INSTALL

SHEET ID
VOLUME 2
E-105

FINAL

DS: LG503118_E-105.dgn
PD:
7:53:58 AM 4/21/2026