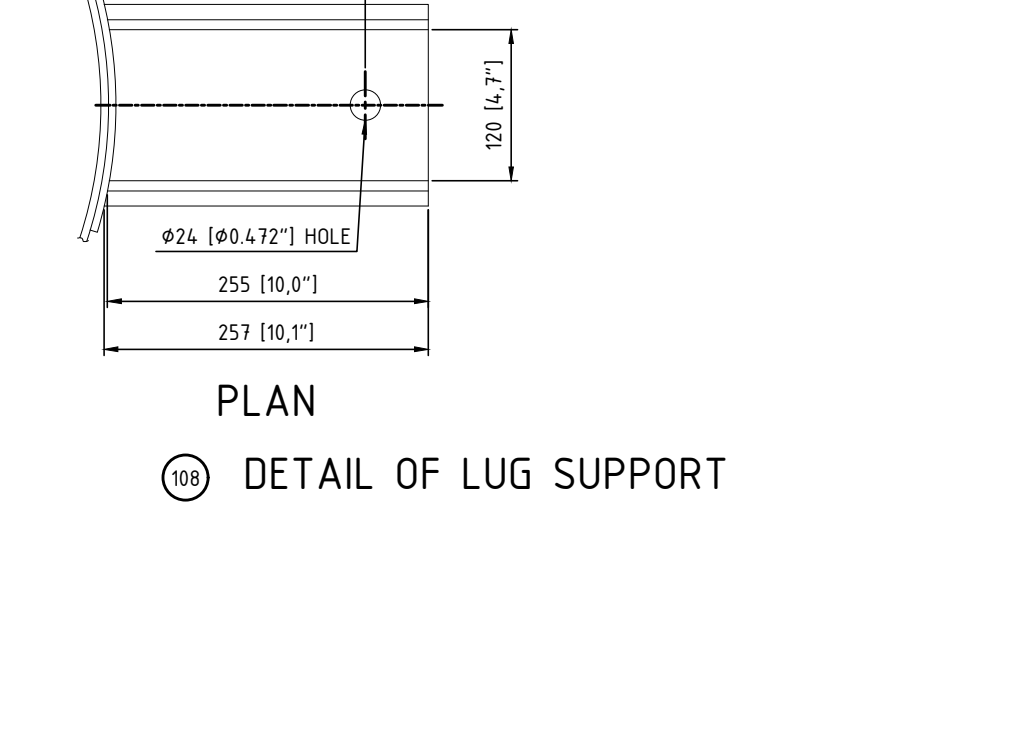
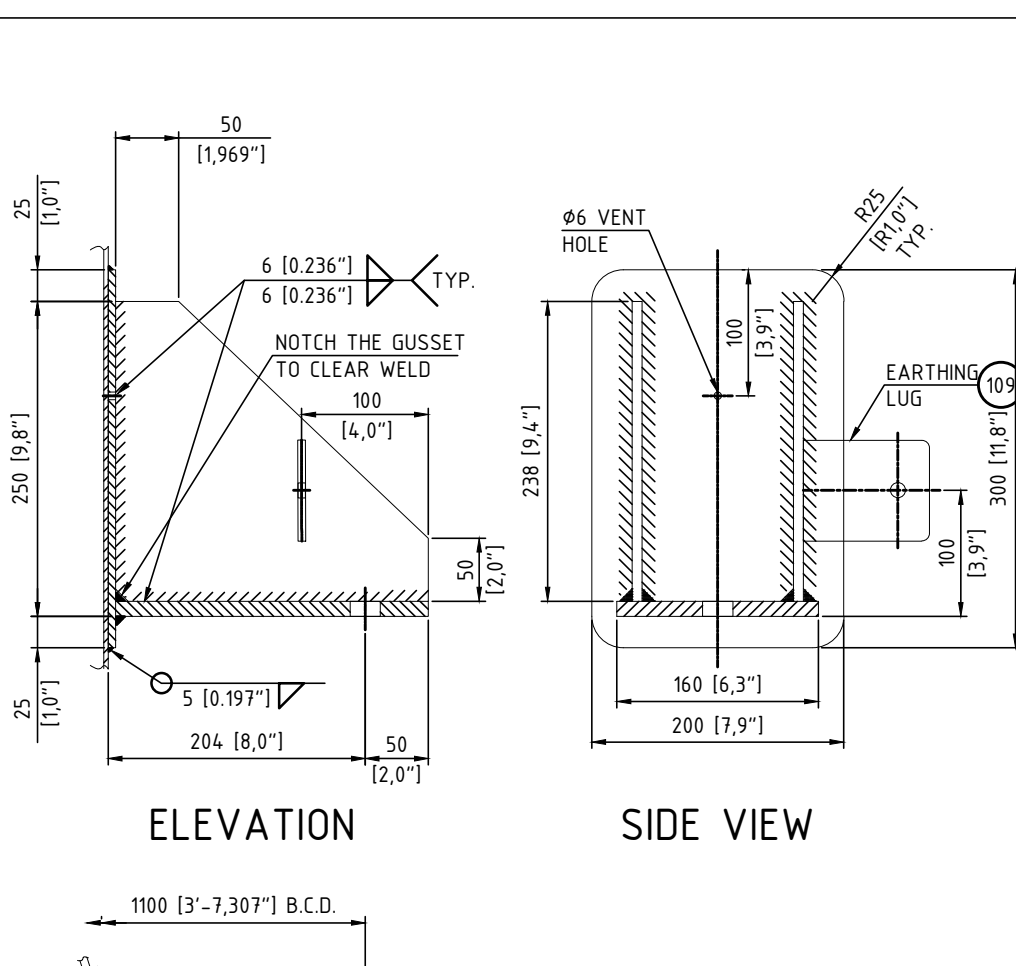
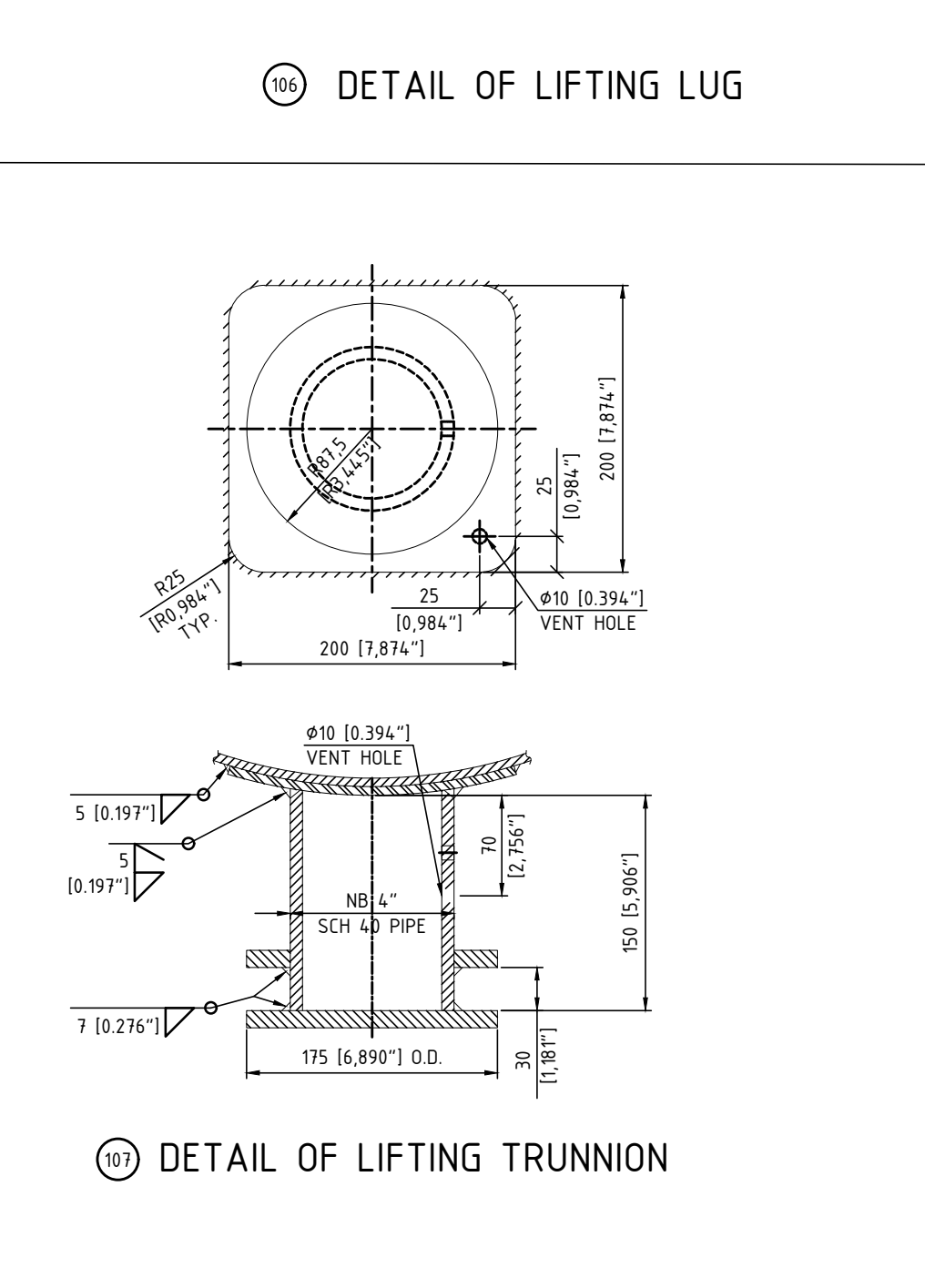
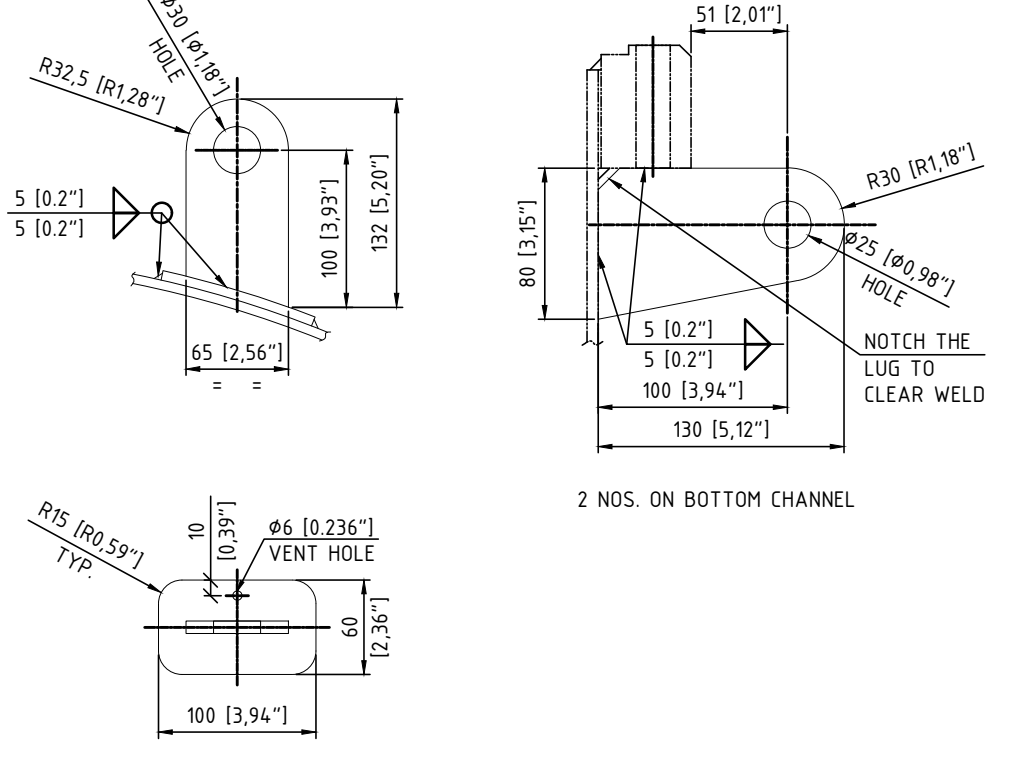
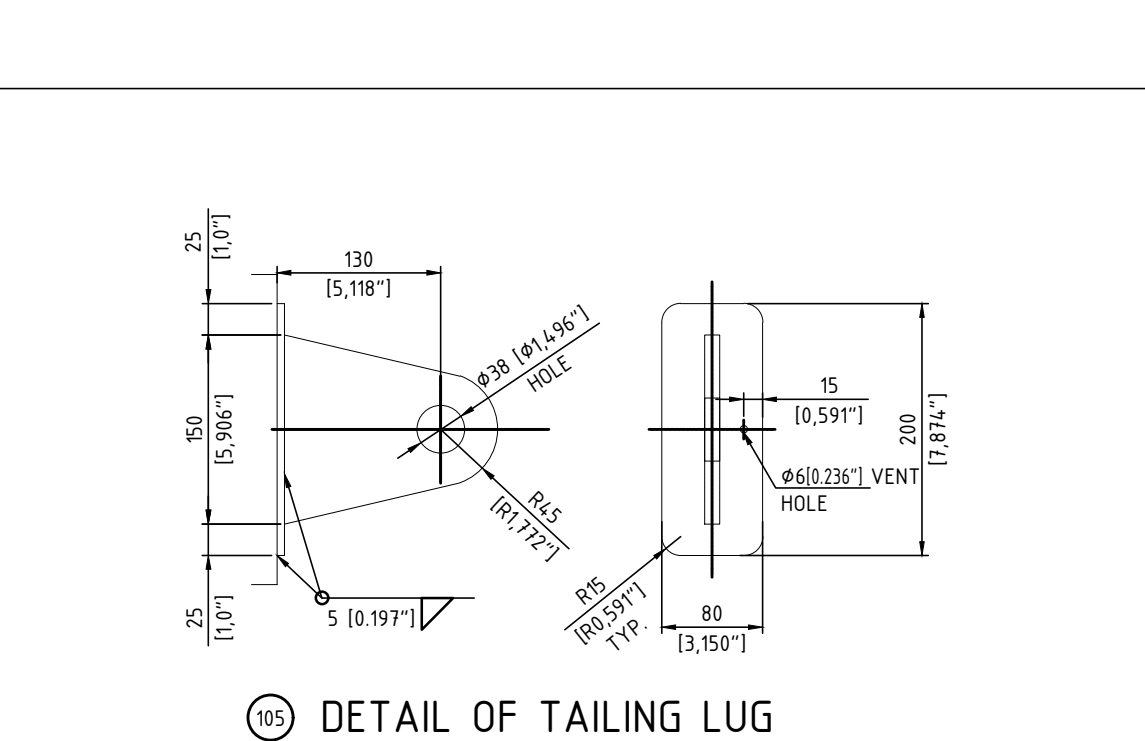
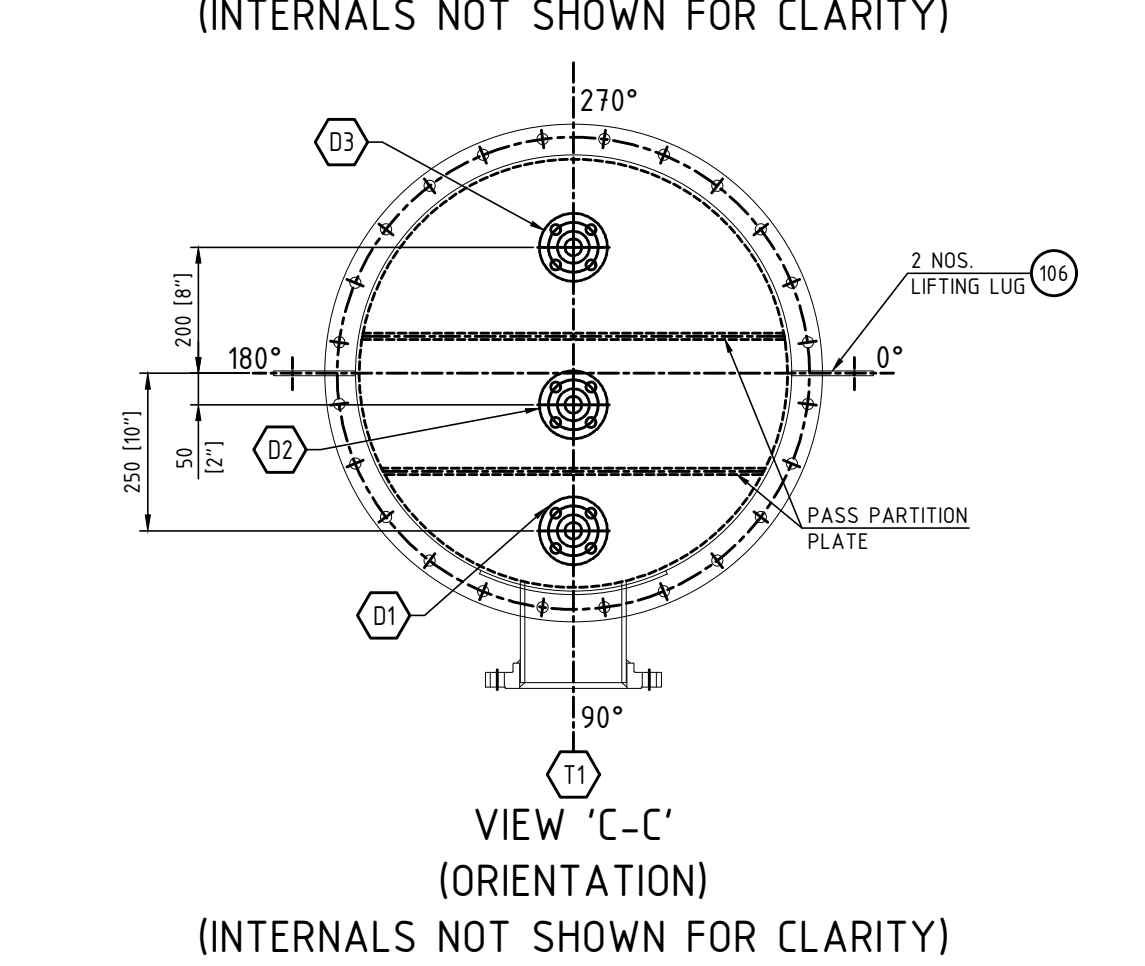
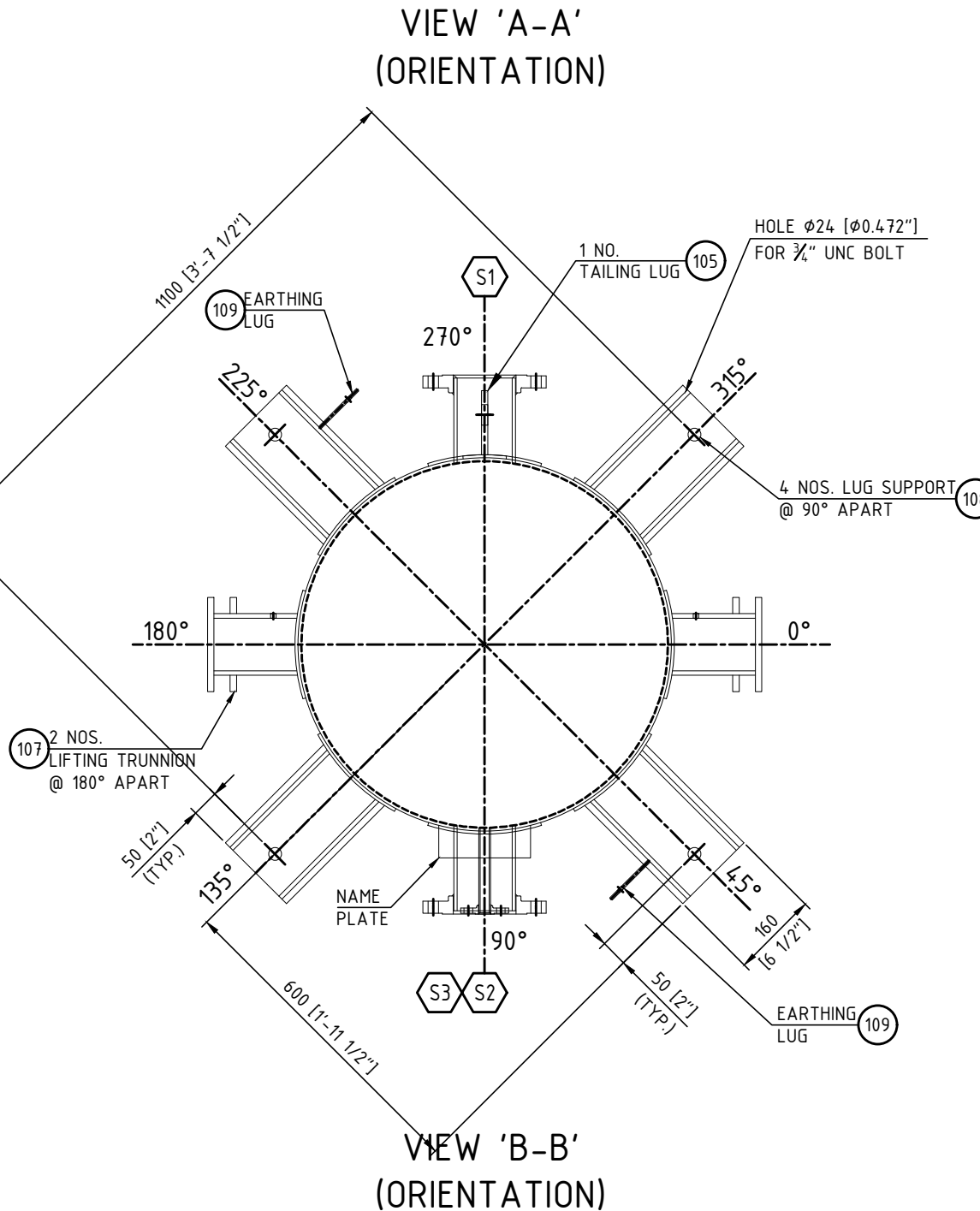
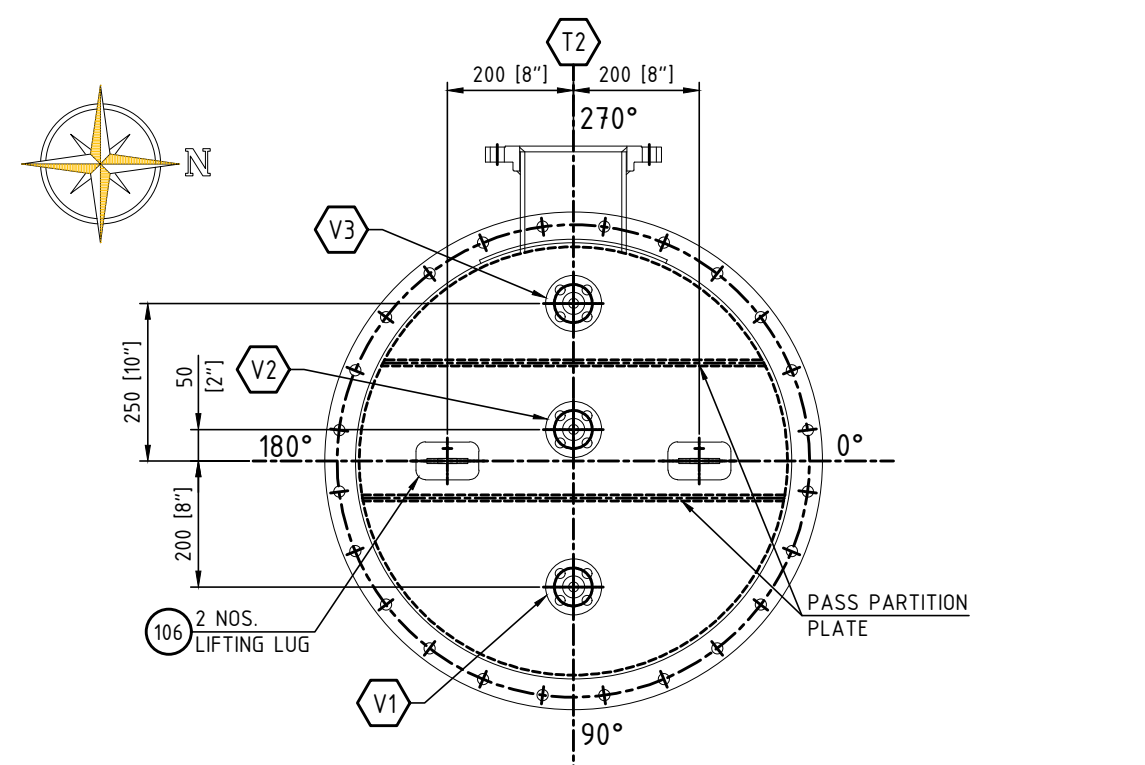
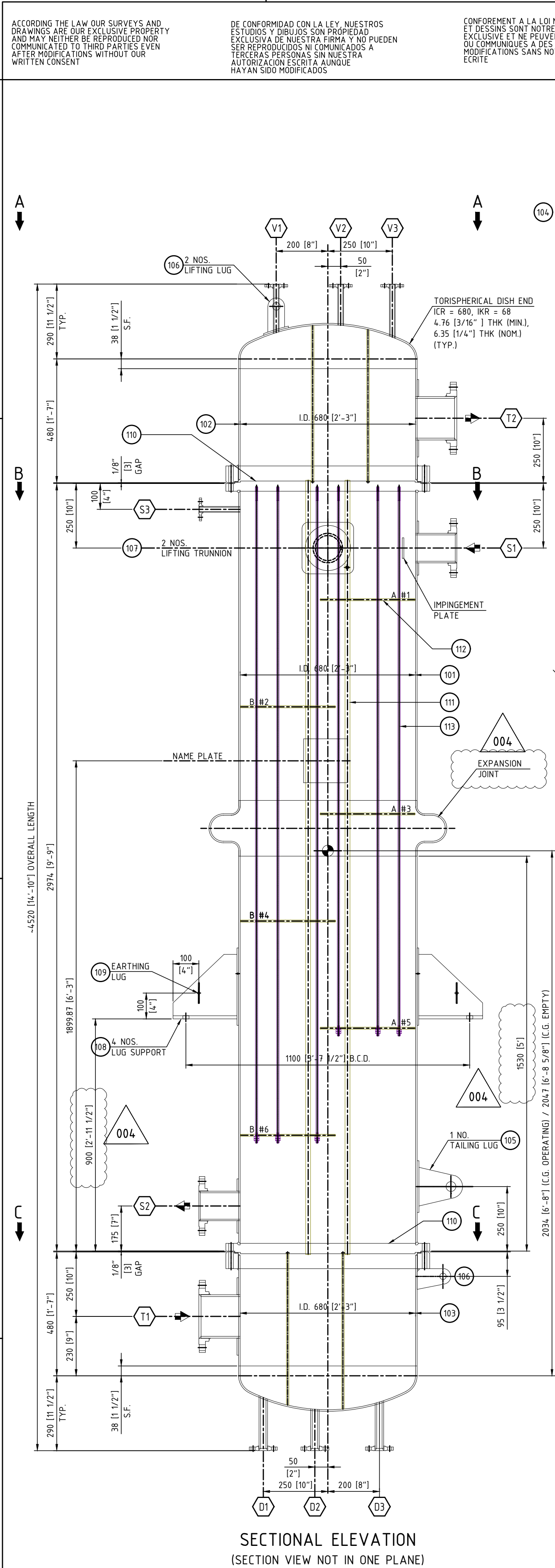


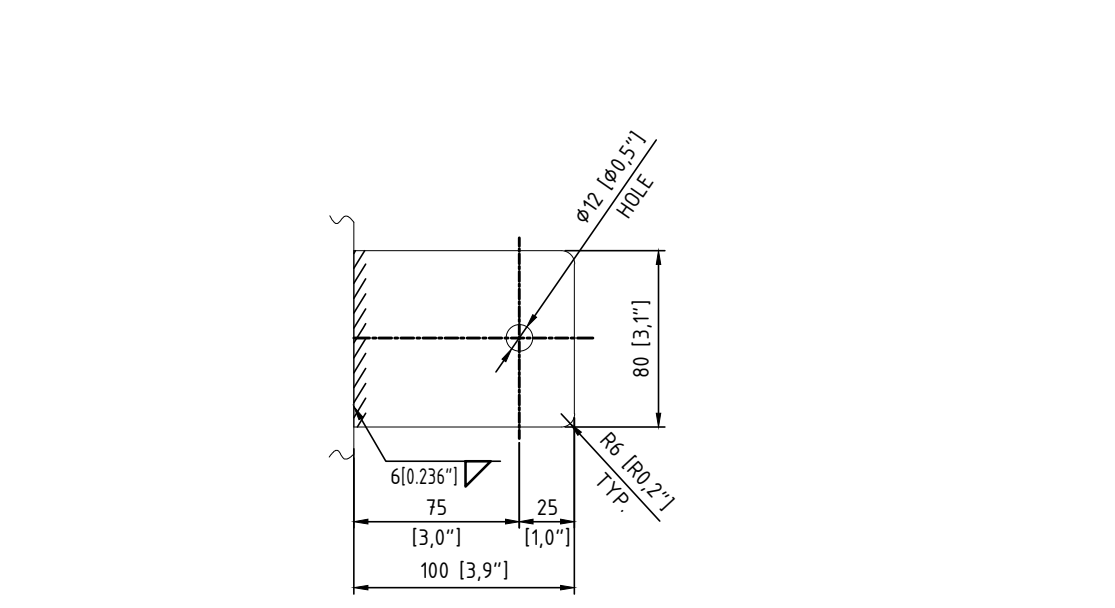


MECHANICAL DESIGN CONDITION FOR FIXED TUBESHEET EXCHANGERS					
CASES	DESCRIPTION	MMT (SHELL) °C [°F]	MMT (TUBE) °C [°F]	Pshell, Bar(g) [psi(g)]	Ptube, Bar(g) [psi(g)]
NORMAL OPERATION	BASE ON THE PERFORMANCE ACCORD TO SPECIFIED CONDITIONS OF THIS TEMA-SHEET	175(347.1)	172(342.7)	8.0(116.03)	2.8(40.6)
COLD START-UP	TUBESIDE OIL INLET @ 80°C AND SHELL WITH STEAM @ 10 Bar(g)	184(363.2)	18(357.8)	10(145.03)	2.8(40.6)
INCIDENT-1:	STEAM VALVE FULLY OPENED, 12 Bar(g) @ SHELL DURING NORMAL OPERATION	191(397.4)	187(370)	12(174.04)	2.8(40.6)
INCIDENT-2:	STEAM OPEN TO SHELLSIDE WITH EMPTY TUBES	175(347.1)	175(347)	8.0(116.03)	0(0)
INCIDENT-3:	SHELL SIDE NO STEAM @ ATM, WHILE CIRCULATING OIL THROUGH TUBES	65(2149.4)	82(5180.5)	0(0)	2.8(40.6)

APPLICABLE STANDARDS FOR WIND & EARTHQUAKE		
WIND DESIGN :- Wind Speed - 101 mph		
EARTHQUAKE DESIGN :- S _{DS} = 1.077g, S _{D1} = 0.664g (ASCE 7-16)		
APPLICABLE STANDARDS		
DESCRIPTION	EDITION	TITLE
METALLIC GASKET FOR PIPE FLANGES (LATEST)	2017	ASME B16.20
STAINLESS STEEL PIPE	2018	ASME B36.19M
WELDED & SEAMLESS WROUGHT STEEL PIPE (LATEST)	2018	ASME B36.10M
FORGED FITTINGS (LATEST)	2016	ASME B16.11
BUTTWELDED FITTINGS (LATEST)	2018	ASME B16.9
NOZZLE FLANGES UP TO NPS 24 / DN 600	2013	ASME B16.5
STAINLESS STEEL TUBES	2019	ASME B31.3

LOADING DATA		
SEISMIC MOMENT	N-m	15610
SEISMIC SHEAR	N	13980
WIND MOMENT	N-m	1110
WIND SHEAR	N	2390

- GENERAL NOTES :-
- ALL DIMENSIONS ARE IN (mm), UNLESS SPECIFIED OTHERWISE.
 - ALL BOLT HOLES SHALL STRADDLE RADIAL CENTER LINES.
 - PROJECTION OF NOZZLES ON SHELL SHALL BE FROM EQUIPMENT C.L. UNLESS SPECIFIED.
 - ALL FULL PENETRATION WELDS (FPW) TO BE CHIPPED BACK TO SOUND METAL ON THE SECOND SIDE & REWELDED, OR FULL PENETRATION WELDS MAY BE ACHIEVED FROM ONE SIDE ONLY USING PROPER QUALIFIED WELDING PROCEDURE (WITH GTAW ROOT PASS)
 - ALL WELDING SURFACES TO BE THOROUGHLY CLEANED OF SCALE, RUST, OIL OR FOREIGN BODIES, BEFORE WELDING.
 - ALL SHARP CORNERS SHALL BE ROUNDED OFF TO A MINIMUM 3mm (1/8 in) RADIUS.
 - ALL REINFORCING PADS SHALL HAVE TWO NUMBER 6 mm, NPT (1/4 in) VENT HOLE, PLACED IN THE LOWEST AREA OF PAD. AFTER COMPLETION OF WELDING, THE PAD SHALL BE SUBJECTED TO DRY AIR AND SOAPY WATER TEST AT 0.1 MPa(g). THESE TEST HOLE SHALL BE FILLED WITH RUST PREVENTATIVE GREASE COMPATIBLE WITH THE BASE MATERIAL PRIOR TO SHIPMENT. DO NOT PLUG THE TEST HOLE.
 - PIPES TO BE USED IN NOZZLE CONSTRUCTION SHALL BE SEAMLESS ONLY, IF FABRICATED (ABOVE NPS 10) THE LONG SEAM SHALL BE 100% RADIOGRAPHED.
 - PRESSURE RELIEF DEVICES SHALL BE PROVIDED BY THE USER & SHALL BE THEIR RESPONSIBILITY.
 - EQUIPMENT TOLERANCES SHALL BE STRINGENT OF CODE(ITEMA) AND SPECIFICATION. TOLERANCES ON FILLET LEG LENGTH SHALL BE ± 3 UNLESS SPECIFIED OTHERWISE TOLERANCE ON ROOT HEIGHT FOR WELD PREPARATION SHALL BE ± 3 .
 - ALL INTERNAL WELD OF SHELL SIDE SHALL BE GROUND FLUSH TO FACILITATE BUNDLE INSERTION. ALL EXTERNAL WELDS SHALL BE KEPT IN AS-WELDED CONDITION.
 - WATER USED FOR HYDROTEST SHALL HAVE CHLORIDE CONTENT LESS THAN 25 ppm.
 - WELDING TO BE DONE AS PER APPROVED WELDING PROCEDURE AND WELD TEST PLAN.
 - PT SHALL BE CARRIED OUT AFTER CHIP BACK IN CASE OF ACCESSIBLE WELD & AFTER ROOT PASS IN CASE OF INACCESSIBLE WELD FOR CATEGORY A, B, C & D JOINT. PT SHALL ALSO BE CARRIED OUT ON ALL ATTACHMENT WELD WITH MAIN SHELL.
 - MACHINED SURFACES, FLANGE FACES, THREADED SURFACES, AND OTHER FINISHED OR DELICATE PARTS SHALL BE WELL-GREASED AND PROTECTED AGAINST RUSTING AND DAMAGE DURING SHIPMENT.
 - IN ADDITION TO THE NDE REQUIREMENT PER CODE & SPECIFICATION, ATTACHMENT WELD FOR LIFTING LUG, TAILING LUG SHALL BE PT/MT EXAMINED.
 - ALL NOZZLE FLANGES UP TO AND INCLUDING 24" NB SHALL BE AS PER ASME B16.5.
 - ALL PRESSURE RETAINING NUTS SHALL BE OF HEAVY SERIES ONLY.
 - GASKET SEATING SURFACE OF GIRTH FLANGE & NOZZLE FLANGE SHALL HAVE SERRATED FINISH OF 32-63 μ m.
 - ANY OFFSET WITHIN THE ALLOWABLE TOLERANCE PROVIDED IN CODE SHALL BE TAPERED AT A THREE TO ONE TAPER.
 - PAINTING:
SHELL SIDE INTERNAL : SURFACE PROTECTION AS PER TNO001
SHELL SIDE EXTERNAL : SURFACE PROTECTION AS PER TNO001
TUBE SIDE INTERNAL : NONE
TUBE SIDE EXTERNAL : NONE
TUBE-TUBESHEET JOINT : NONE



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DETAIL OF EARTHING LUG