

COMPREHENSIVE RESPONSE SHEET		
Project ID & Description		Flue Gas Desulphurization for NTPC Ramagundam
Equipment Name & System Details		Wet Ball Mill & Limestone Slurry Preparation System
Name of Document		Sizing & General Arrangement of Mill circuit Tank
NTPC Doc No		3130-109-PVM-B-204 Rev No : 0
BHEL Doc No		3130-109-PVM-B-204 Rev No : 0
Sl .No.	NTPC Comments dated 26.07.2022	BHEL Reply dated 29.08.2022
1	What is the basis of retention time selected.	As per the tkll standard practice, retention time is calculated as per the effective height between pump suction nozzle to Overflow nozzle. Based on the tkll standard and practice for close loop operation, retention time for operating volume of 5 minutes is sufficient.
2	What is provision of measuring level in the slurry tank.	2 Level transmitters are provided on mill tank roof for measuring level.
3	Air vent shall have bird screen with inverted U type	Ensured. Vent details updated.
4	Data sheet of mill circuit tank to be mentioned	Design Data, Material of Construction and Nozzle data furnished.
5	Source of dilution water to be mentioned	Source of Dilution water is from process water pump.
6	Provision of spare nozzle to be mentioned	Spare nozzle provided.

01	03.09.2022	revised inline with customer vide comments	UDAY	PVS	AMAN
00	07.07.2022	First Submission	UDAY	PVS	AMAN
REV	DATE	DESCRIPTION / NOTE	PRD	CHD	APD

REVISIONS

DRAWING TITLE: Sizing & General Arrangement of Mill circuit Tank



OWNER/PROJECT: NTPC-RAMAGUNDAM THERMAL POWER PROJECT(RTPP) RAMAGUNDAM STAGE-I (3X200 MW) & II (3X500 MW) – FGD SYSTEM PACKAGE



EPC CONTRACTOR:
BHARAT HEAVY ELECTRICALS LTD.

Sub-Vendor:



thyssenkrupp Industries India Pvt. Ltd. Pune,

	NAME	DATE	
PREPARED BY	UDAY	07.07.2022	STATUS : FOR APPROVAL
CHECKED BY	PVS	07.07.2022	VENDOR DRAWING No.:
APPROVED BY	AMAN	07.07.2022	REV NO : 01

NTPC DRG./DOC NO. : 3130-109-PVM-B-204

Mill Circuit Tank Sizing and Selection:

The Mill tank is sized and selected to hold as well as to dilute the circulating slurry of the mill circuit for desired operation of the Ball mill for limestone grinding.

Now, from the mass balance of the mill circuit, the overall circulating liquid flow rate through the mill circuit tank is 237 m³/hr. (3.95 m³/min). Refer drawing no. 3130-109-PVM-B-004.

Selected tank diameter & height considering the plant layout: Dia. 3.7m x Height 3.0m
For this tank, overall volume = $\pi \times 3.7 \times 3.7 \times 3.0 / 4 = 32 \text{ m}^3$

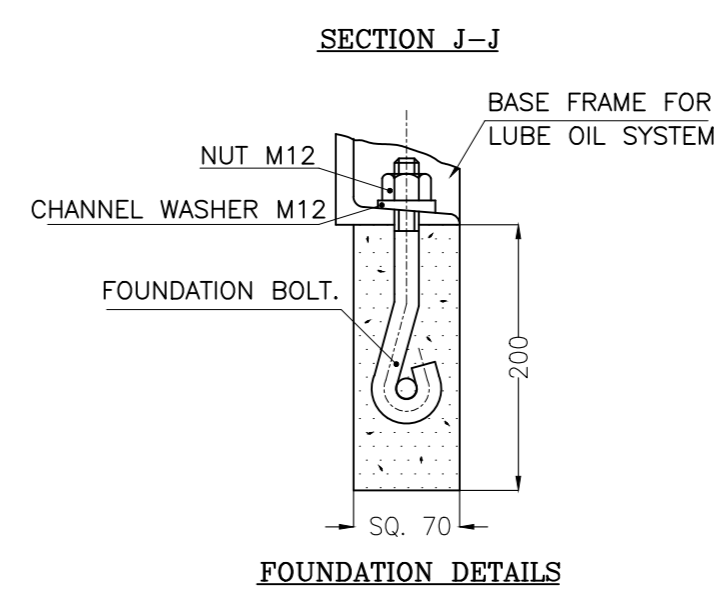
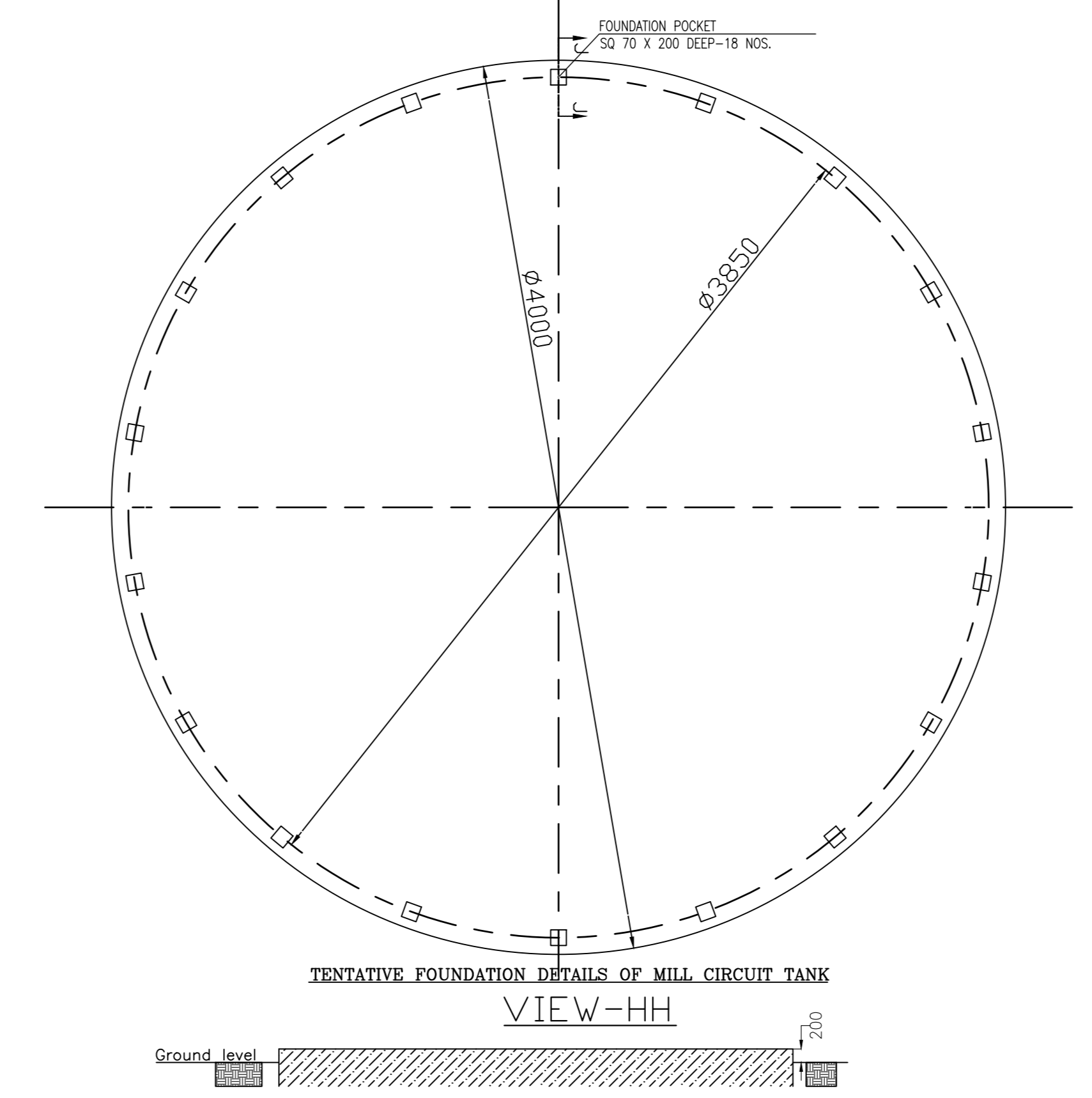
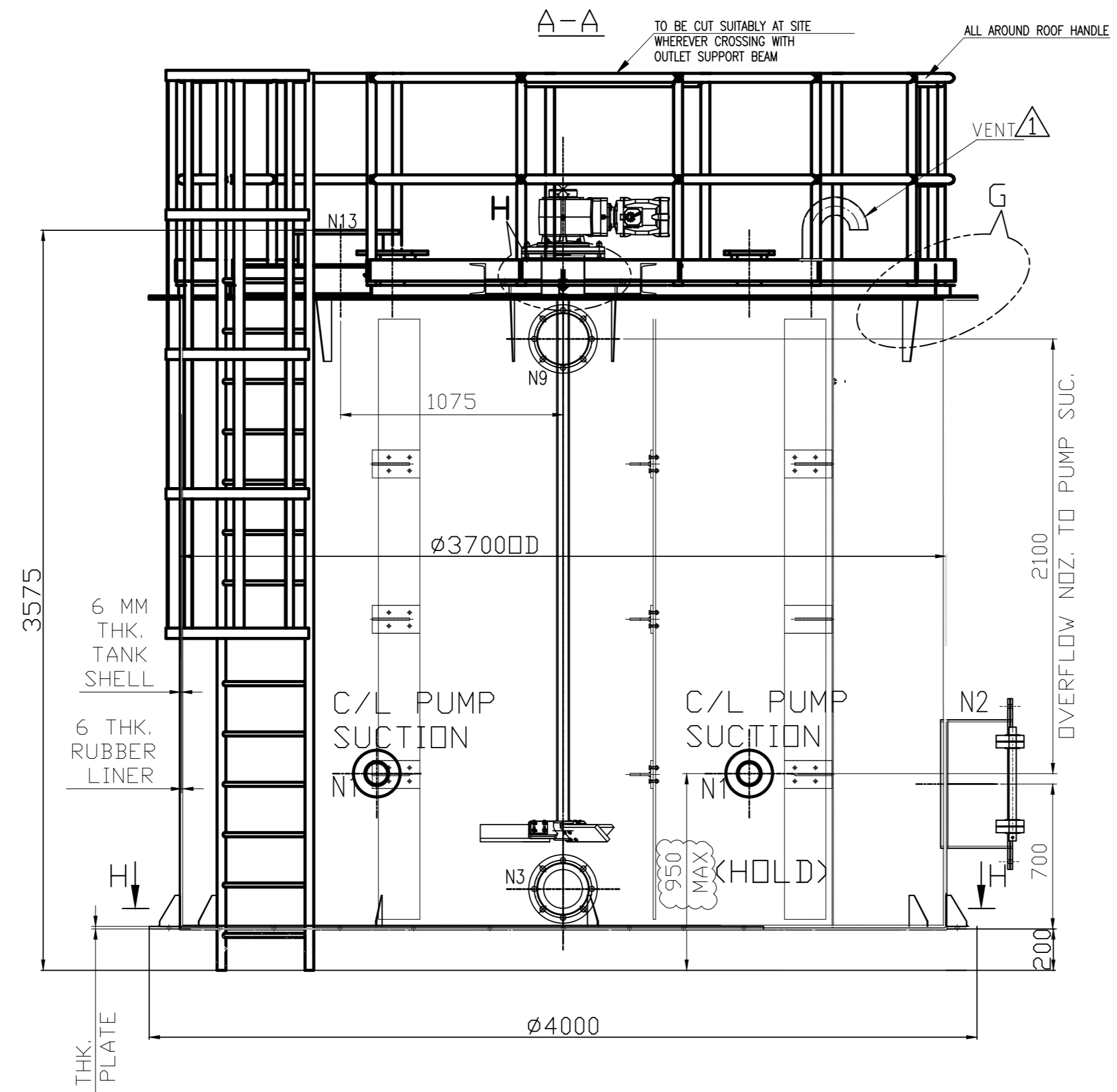
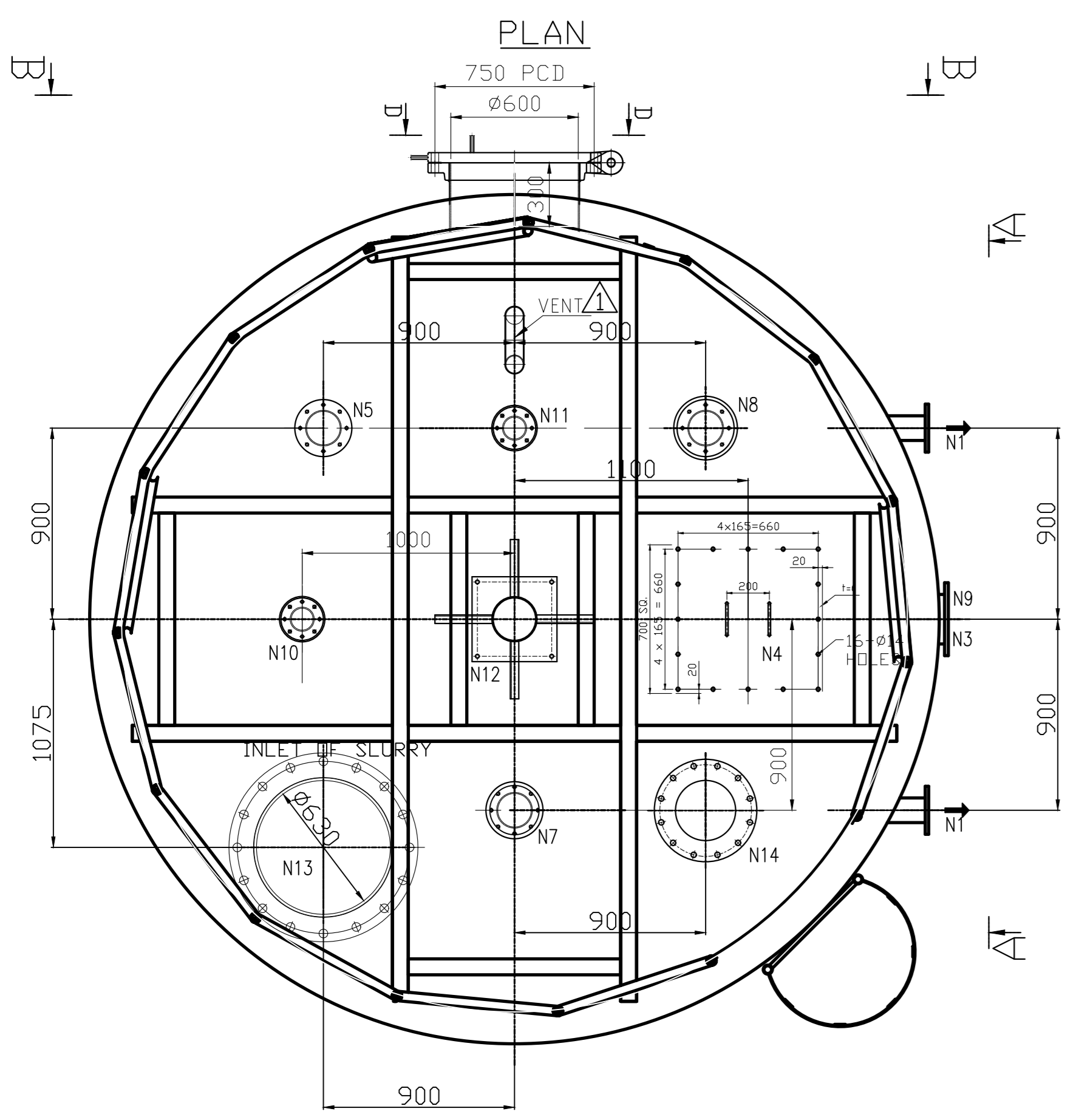
The height between Pump suction nozzles to overflow nozzle is 2.1m as per the tank GA drawing.

Accordingly, the effective capacity of mill circuit tank = $\pi \times 3.7 \times 3.7 \times 2.1 / 4 = 22.5 \text{ m}^3$.

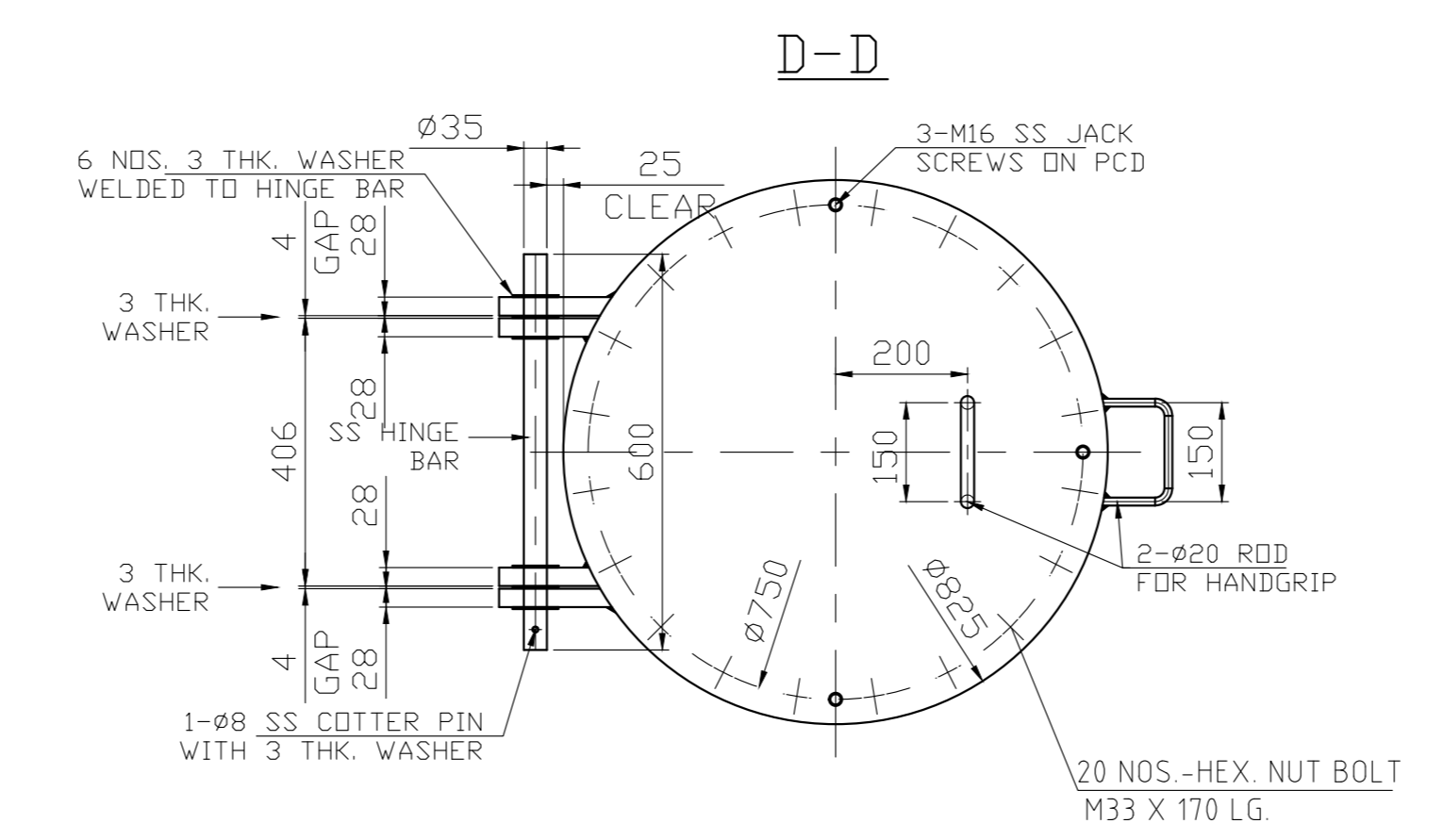
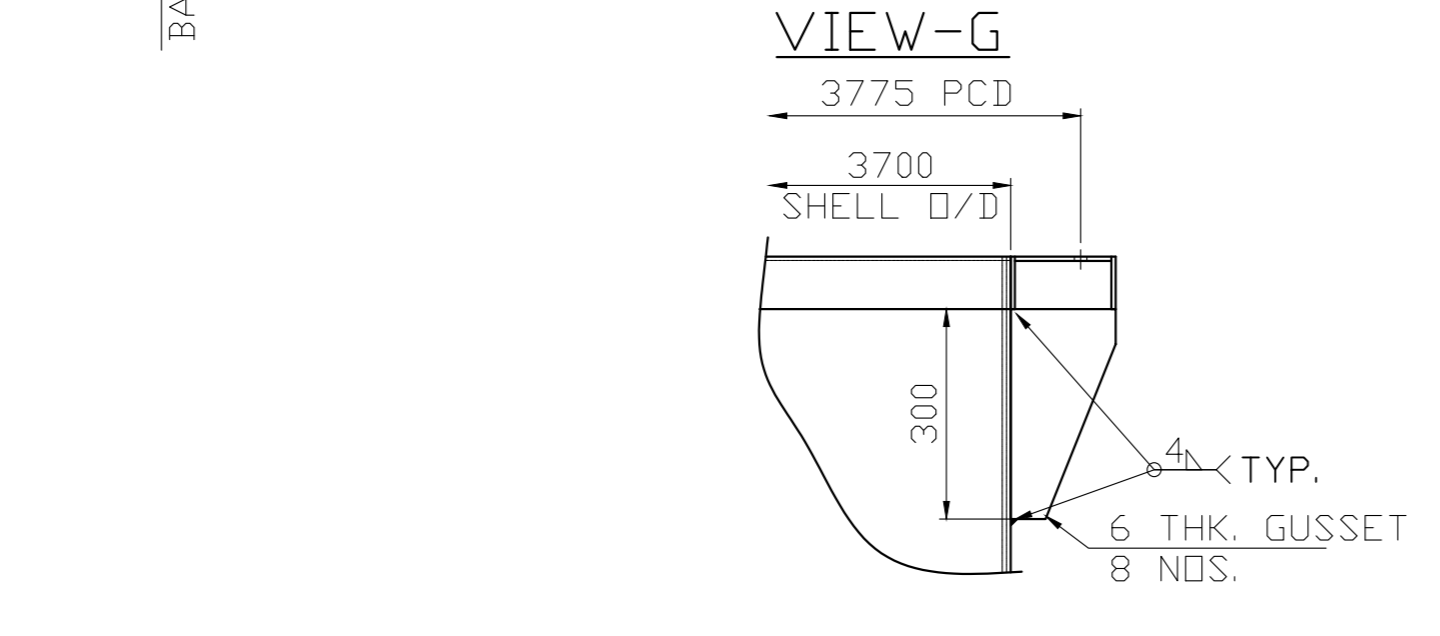
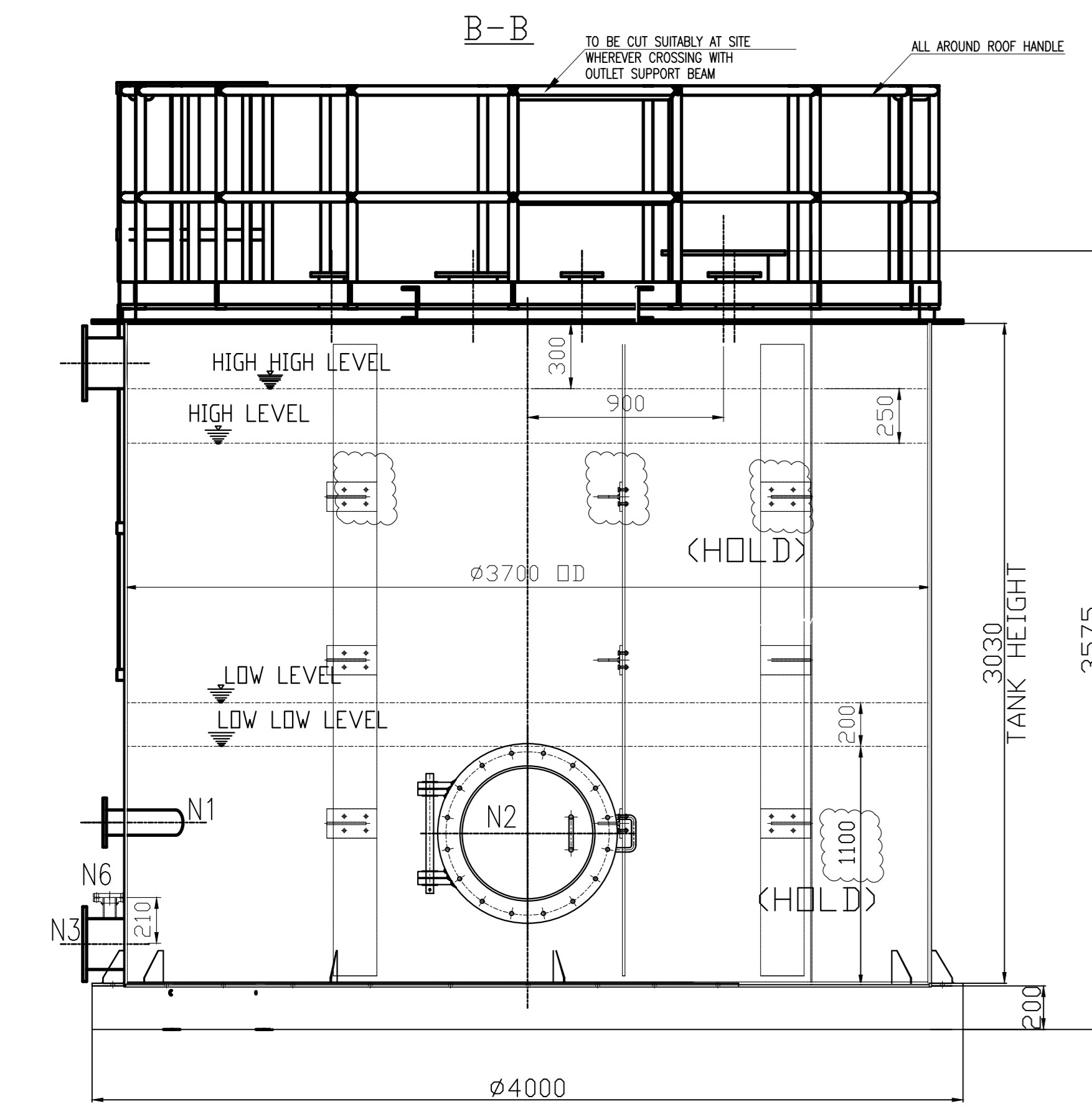
The retention time = $22.5 \text{ m}^3 / 3.95 \text{ m}^3/\text{min} = \sim 5.7 \text{ minutes}$.

Based on the tkll standards for close loop operation, this time is sufficient for Wet ball mill circuit.

Hence, the selected tank size is sufficient.



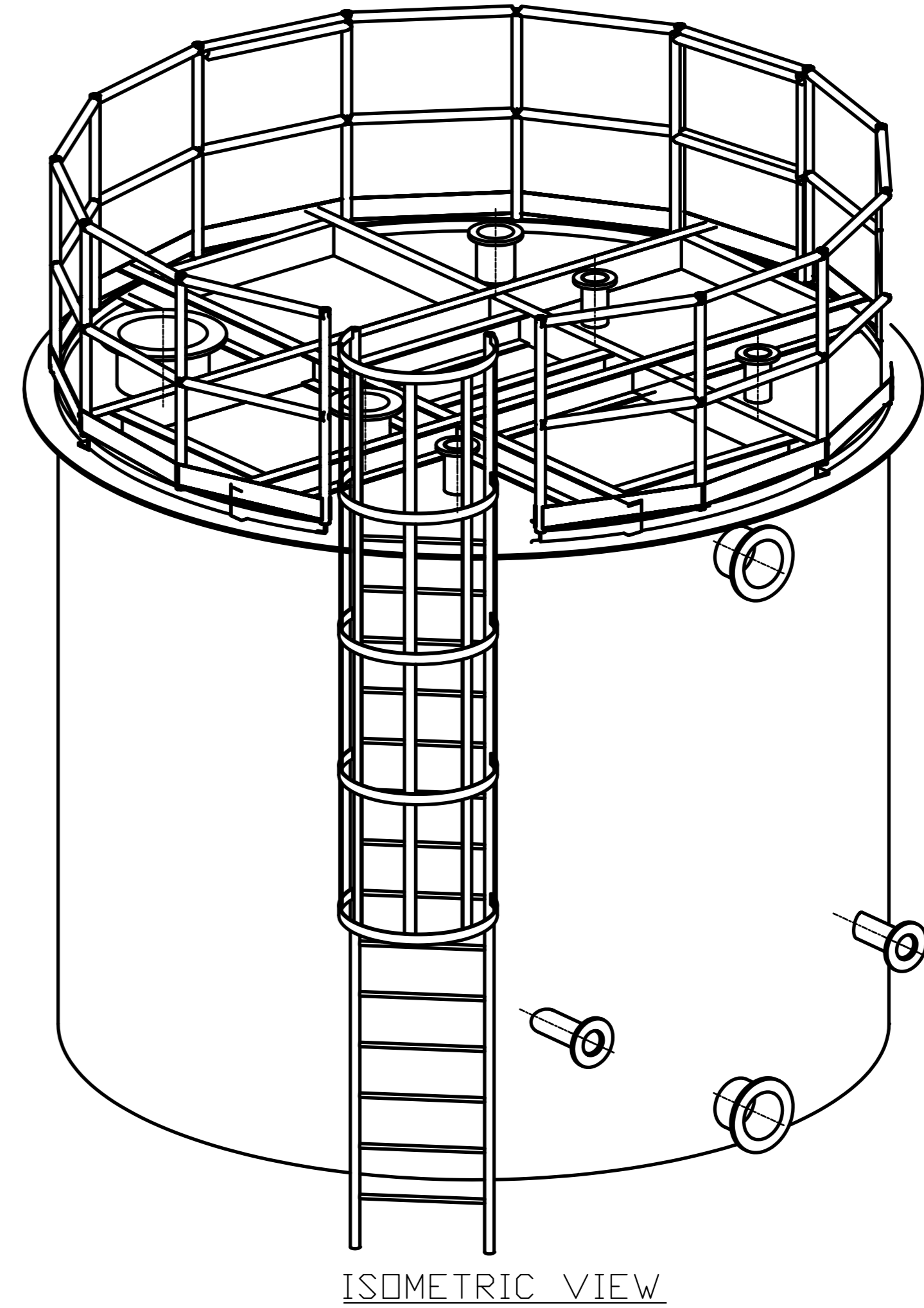
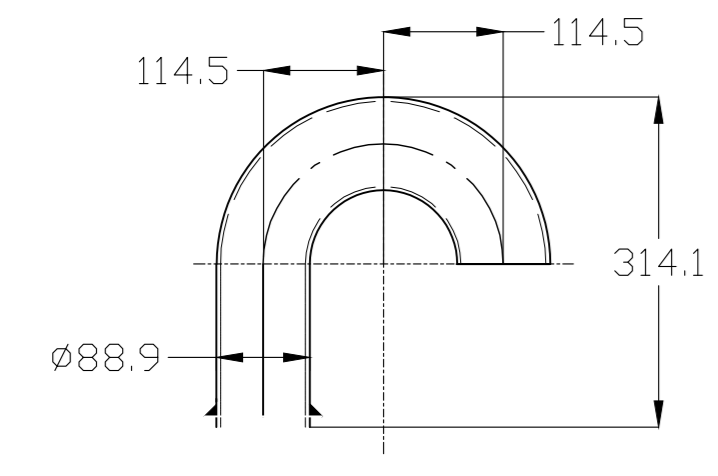
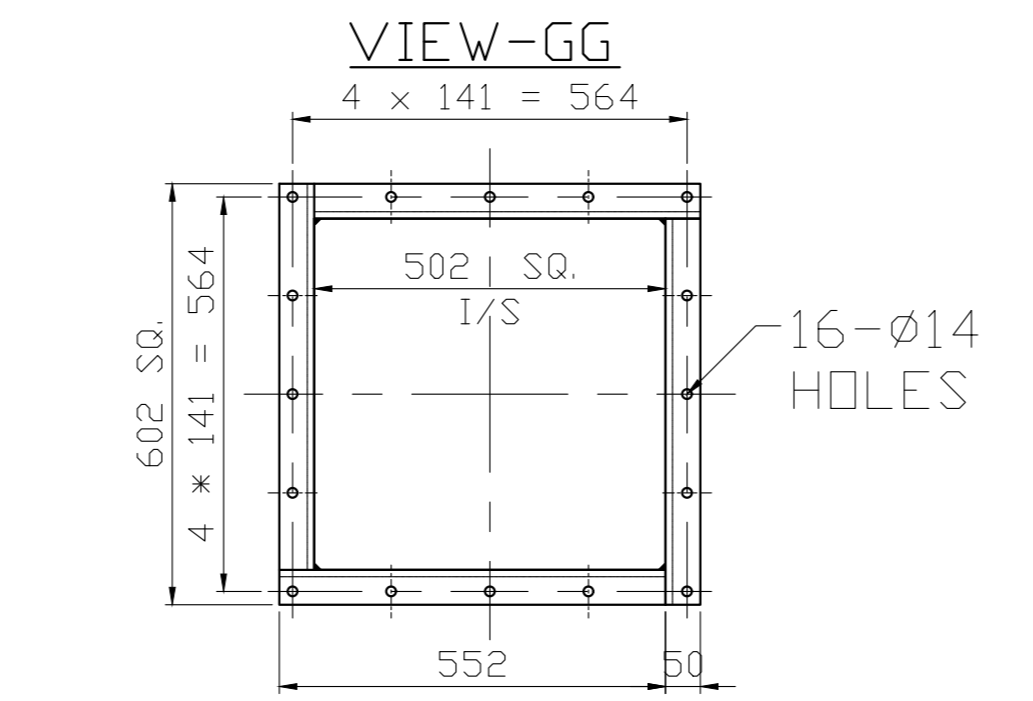
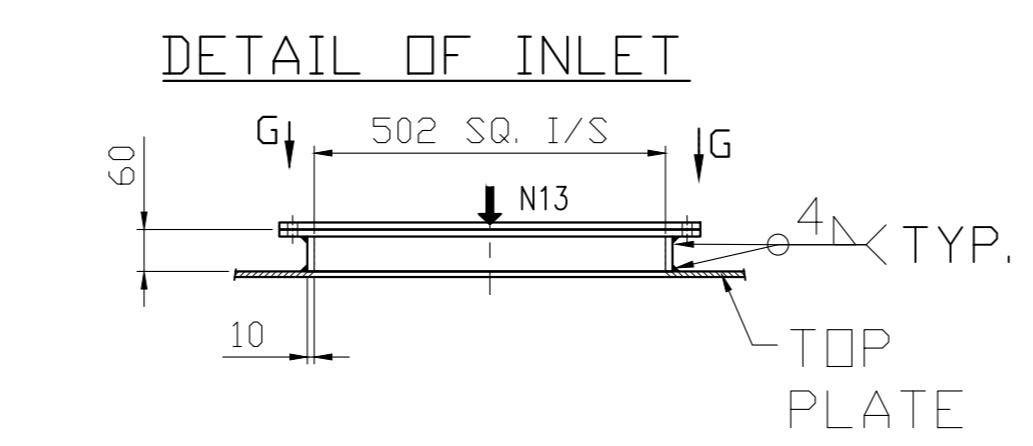
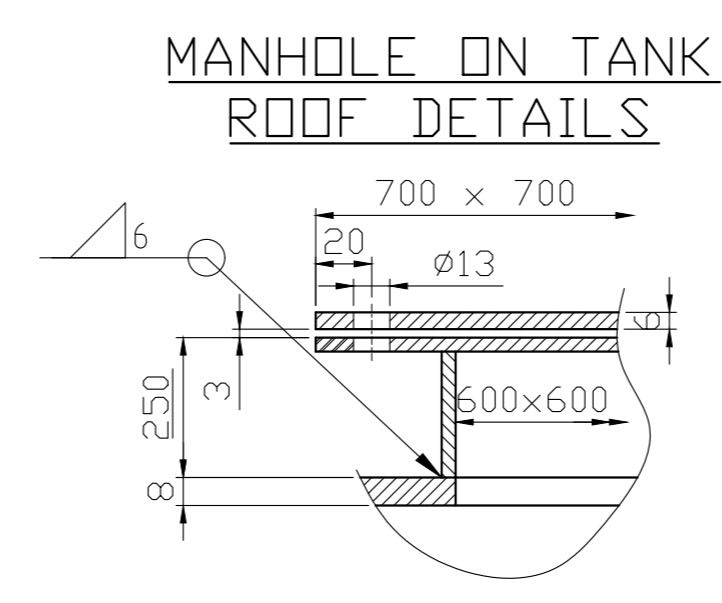
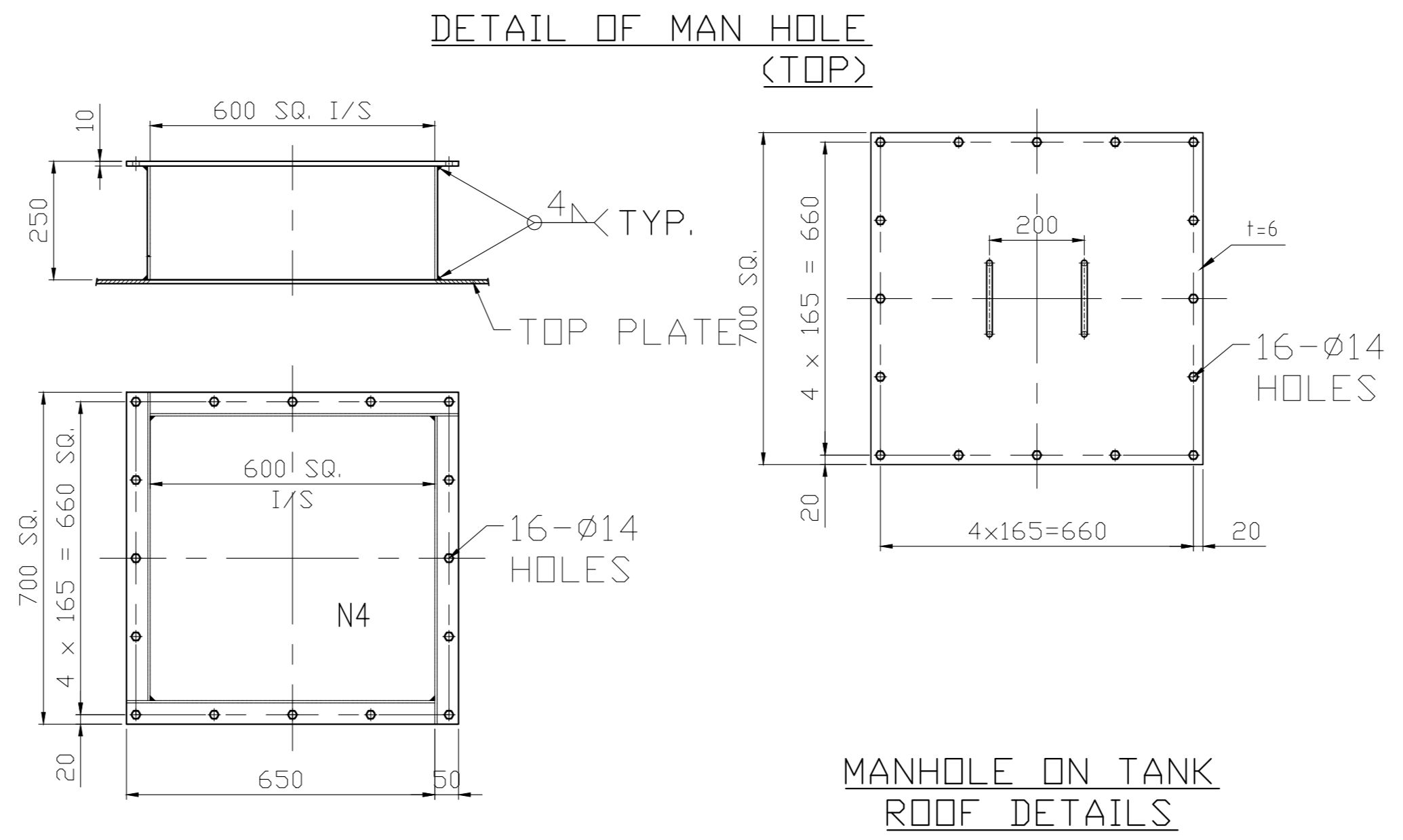
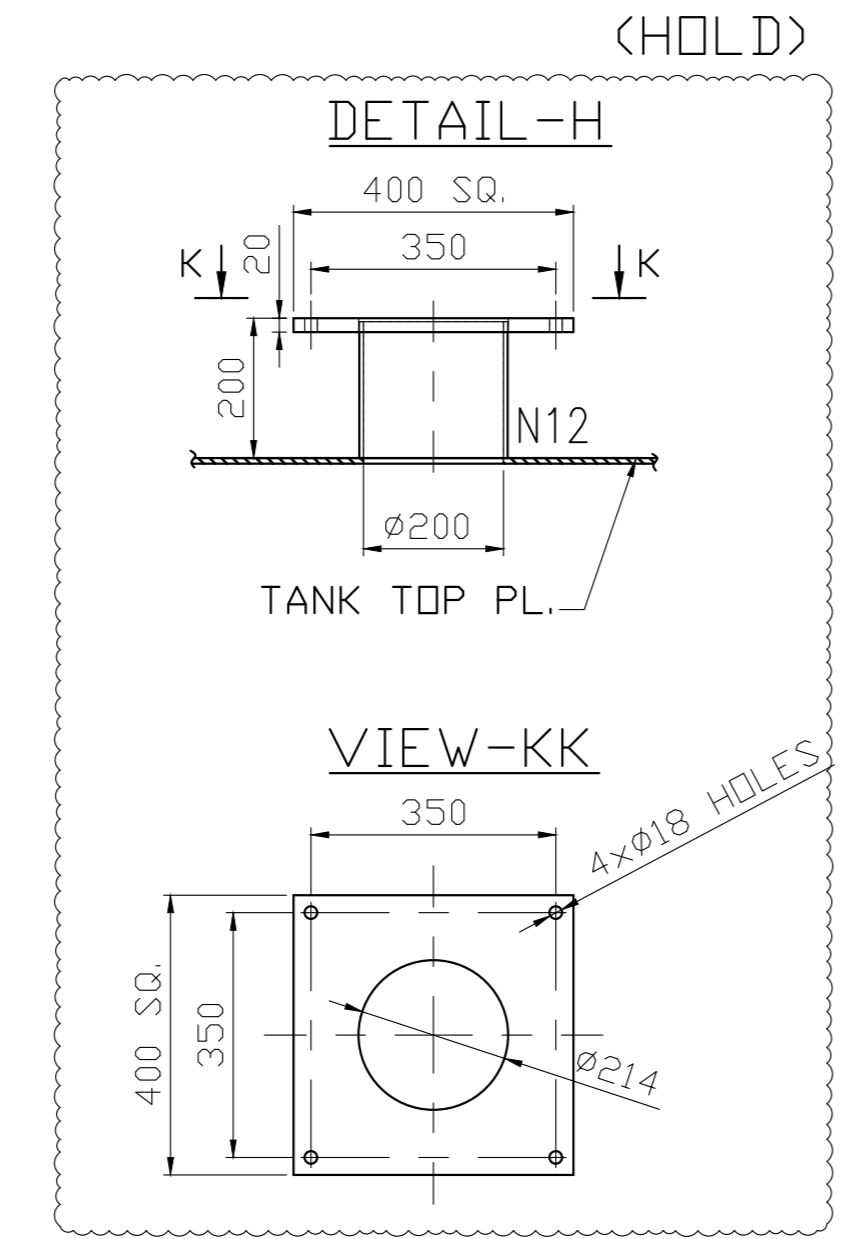
DESIGN DATA	
01 DESIGN CODE	IS: 803
02 TAG NO.	00HTK00B001 & 00HTK00B002
03 QUANTITY	2 NOS.
04 ORIENTATION	VERTICAL
05 DESIGN PRESSURE	ATMOSPHERIC + STATIC (3450 MM)
06 DESIGN TEMPERATURE	70°
07 OPERATING TEMPERATURE	ATMOSPHERIC
08 OPERATING TEMPERATURE	61°
09 HYDRO TEST PRESSURE	FULL OF WATER
10 FLUID TYPE	LIME STONE SLURRY
11 FLUID DENSITY	1450 KG/M ³
12 CORROSION ALLOWANCE	1.5 MM
13 POST WELD HEAT TREATMENT	NA
14 JOINT EFFICIENCY	0.7
15 RADIOGRAPHIC REQUIREMENT	NIL
16 EFFECTIVE CAPACITY	22 CU.M
17 TOTAL CAPACITY	32 CU.M
18 WIND DESIGN CODE	IS: 875
19 SEISMIC DESIGN CODE	IS: 1893
20 WEIGHT	
A EMPTY W.C. AGITATOR & LINER	5000 KGS.(TENTATIVE)
B OPERATING (UPTO HHL)	30000 KGS(TENTATIVE)



MATERIAL OF CONSTRUCTION		NOZZLE DATA						
		POSITION	DIMENSION	FLANGE TYPE	STD. FOR DIMENSION	R-PAD	QTY	LOCATION
01 SHELL /HEADS/R.F. PADS	IS: 2062 E250 GR. BR	N1	DN200	SOFP TYPE	ASME B16.5, 150#	#356	2	PUMP SUCTION (AT SHELL)
02 NOZZLE FROM PLATE	IS: 2062 E250 GR. BR	N2	600	FF	IS-803/APT 650	#300	1	MAIN HOLE (AT SHELL)
03 NOZZLE FROM PIPE	ERW IS-1978	N3	DN250	SOFP TYPE	ASME B16.5, 150#	#305	1	BRAIN PIPE (AT SHELL)
04 NOZZLE FLANGE/BLIND FLANGE	IS:2062	N4	600 x 600	FF	---	900X900	1	MAIN HOLE (ON ROOF)
05 MANHOLE FLANGE	IS: 2062 E250 GR. BR	N5	DN150	SOFP TYPE	ASME B16.5, 150#	#305	1	MAN HOLE (ON ROOF)
06 FITTINGS	A 234 Gr.WPB/ASTM A105/IS: 1239 (UPTO 150 NB)	N6	DN50	SOFP TYPE	ASME B16.5, 150#	#192	1	MAN HOLE (ON ROOF)
07 CASKET	SPIRAL WOUND METALLIC GASKET WITH GRAPHITE FILLER	N7	DN150	SOFP TYPE	ASME B16.5, 150#	#305	1	MAN HOLE (ON ROOF)
08 EARTHING LUG	A240-304	N8	DN200	SOFP TYPE	ASME B16.5, 150#	#356	1	SOLUTION WATER (ON ROOF)
09 STUDS BOLT/NUTS	A 193 Gr.B7/A 194 Gr.2h	N9	DN200	SOFP TYPE	ASME B16.5, 150#	#356	1	OVER FLOW (AT SHELL)
10 NAME PLATE	ANSI-316	N10	DN100	SOFP TYPE	ASME B16.5, 150#	#203	1	NOZZLE FOR AIR VENT (ON ROOF)
11 FOUNDATION BOLT	CAST STEEL GR. 8.8	N11	DN100	SOFP TYPE	ASME B16.5, 150#	#203	1	SLURRY NOZZLE FOR LINE AREA SLURRY (ON ROOF)
12 LADDER	IS:2062	N12	450x450	---	---	---	1	OUTPUT FOR AGITATOR (ON ROOF)
13 HAND RAIL	ERW PIPE, IS:1239	N13	6530	---	---	---	1	INLET SLURRY NOZZLE (ON ROOF)
		N14	DN250	SOFP TYPE	ASME B16.5, 150#	#407	1	HYDROLYSE TO TANK SLURRY NOZZLE (ON ROOF)

- NOTES:
- ALL DIMENSION ARE IN MM.
 - ALL INTERNAL SURFACES OF LIME SLURRY TANK IS LINED WITH 6MM THK. REPLACEABLE CHLOROBUTYL /BROMOBUTYL RUBBER.
 - ALL FLANGES FACES ARE LINED WITH 6MM THK CHLOROBUTYL /BROMOBUTYL RUBBER.
 - Painting-

Surface preparation at shop	Primer at shop	Intermediate	Final	Total DFT (In micrometer)	Paint shade
SA 2 1/2	Epoxy resin based zinc phosphate primer nominal 100 micron @ shop	Epoxy resin based paint pigmented with titanium dioxide or m10 > 100 micron @ shop	Polyamide cured colour pigmented epoxy based paint 75 micron and polyurethane based colour pigmented point DFT=25 micron(min)	300	RAL-9002, Gray for external body
 - F.F.L. IN THIS AREA CORRESPONDS TO IS EL(+).7.5 M WHICH IS RL. 159.5M.
 - THE SHOWN ARRANGEMENT AS PER DRAWING ARE SAME FOR TANK-A & TANK-B.



All holds shall be released.

REV.	DATE	DESCRIPTION	ISSN	APPD	CHKD	APPRD
01	02.09.2022	ISSUED AS PER NTPC COMMENTS	LDAY	PVS	AMAN	KHRV
00	06.07.2022	ISSUED FOR APPROVAL	LDAY	PVS	AMAN	KHRV

NTPC DRG NO: 3130-109-PVM-B-204

3 X 200MW (Stage-I)+3X500 MW (Stage-II)
NTPC RAMAGUNDAM FGD SYSTEM PACKAGE

REV.	DATE	DESCRIPTION	ISSN	APPD	CHKD	APPRD
01	02.09.2022	ISSUED AS PER NTPC COMMENTS	LDAY	PVS	AMAN	KHRV
00	06.07.2022	ISSUED FOR APPROVAL	LDAY	PVS	AMAN	KHRV

TITLE: GENERAL ARRANGEMENT OF MILL CIRCUIT TANK
DRAWING NO. HY-RDM-MCT-GA
SCALE: 1: NTS
SHEET 1 OF 1
REV 01