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NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व थिकनैस	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया		क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
1	1	600	14 THK.	300	WN	RF	SEE DWG.	300xT	MANHOLE+B.F.+ DAVIT
3	1	200	80	300	WN	RF	2090	110xT	VENTILATION NOZZLE
6	1	200 (H)	80	300	WN	RF	2090	110xT	VAPOR OUTLET TO 300-CC-00-3001/ DRY FLARE
11	1	500	14 THK.	300	WN	RF	2090	250xT	FEED FROM 300-EE-4005A/B
12	1	100	120	300	WN	RF	2090	60xT	STARTUP FROM OSBL LP ETHYLENE STORAGE
17	1	750	14 THK.	300	WN	RF	1990	380xT	LIQUID BOTTOM OUTLET TO 300-PA-CF-4003 A/B, 300-PA-CF-4004 A/B, 300-EP-00-4007
20	1	80 (H)	160	300	WN	RF	2090	45xT	MIN. FLOW FROM 300-PA-CF-4003 A/B, 300-PA-CF-4004 A/B
24	1	80 (H)	160	300	WN	RF	2090	45xT	PUMP VENT RETURN FROM 300-PA-CF-4003 A/B,300-PA-CF-4004 A/B
31	1	80	160	300	WN	RF	1890	45xT	DRAIN
35	1	50	160	600	WN	RF	SEE DWG.	-	UTILITY CONNECTION
LT1	2	50 (H)	160	300	WN	RF	1110(H)	-	LEVEL TRANSMITTER (DP)
LT2							1350(H)		
LT3	2	50 (H)	160	300	WN	RF	1110(H)	-	LEVEL TRANSMITTER (DP)
LT4							1350(H)		
SP1	2	50 (H)	160	300	WN	RF	1110(H)	-	STAND PIPE
SP2							1350(H)		

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
SEISMIC (MC)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 VESSEL SHALL BE SUBJECTED TO DRY OUT CONDITIONS OF 7.0 Kg/Cm²(g) AT 80ºC.
14 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
15 VENDOR TO PROVIDE WOODEN PILLOW FOR SADDLE SUPPORT AS PER EIL STD. 7-12-0003.
16 ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-)45ºC WITH MIN. ENERGY VALUE AS PER FIG. UG84.1 OF ASME SEC. VIII DIV.1.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABILITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
X	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
X	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS.	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	-
	SKETCH FOR MONKEY LADDER	-
	PROCESS DATA SHEET	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES- SP 1-2,LT 1-4
X	NOZZLE ELEVATIONS- SP 1-2,LT 1-4	X	PIPE SUPPORT CLEATS
X	FIXED / SLIDING SUPPORT	X	LADDER/PLATFORM CLEATS
	NOZZLE RATING		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm^2g)	15.5
DESIGN PRESSURE (kg/cm^2g)	INT. 19.5 EXT. -
WORKING TEMPERATURE (°C)	(-) 36
DESIGN TEMPERATURE (°C)	(-) 45 / 65
MDMT (°C)	(-) 45
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD:AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.453 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	IS-1893 (PART-4) + SITE SPECTRA
CAPACITY (M^3)	122.5
PAINTING/CLEANING	AS PER JOB SPEC.(REFER NOTE-12)
INSULATION THICKNESS (mm)	100 (IC) [ ] HOT [X] COLD
FIRE PROOFING CLEATS	[ ] YES [X] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	25.35
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.60*
REINFORCEMENT PAD	SA 516 Gr.60*
HEADS	SA 516 Gr.60*
SHELL FLANGES	-
NOZZLE FLANGES	SA 350 GR.L F2 CL.1
NOZZLE NECK UPTO 250 NB	SA 333 GR.6
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.60*
PIPE FITTINGS	SA 420 GR.WPL6
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 320 L7 / SA 194 GR.7 B
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	SA 516 Gr.60*
~~SKIRT~~/ SUPPORT BASE	SA 516 Gr.60*
INTERNAL PARTS (WELDED)	SA 516 Gr.60* / SA 333 GR.6
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.60*
WRAPPER PLATE	SA 516 Gr.60*
PAD FOR EXTERNAL ATTACHMENT	SA 516 Gr.60*

* MATERIAL SHALL BE IMPACT TESTED AS PER SPEC./ CODE REQUIREMENT

SPECIAL SERVICE : -

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)
DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	51000	OPERATING	111000
HYDROTEST(SHOP)	173500	HYDROTEST (FIELD)	185000
NUMBER OF ITEMS :	ONE		

PDS B957-300-79-41-DS-1264 REV.1

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	19.08.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB
A	11.08.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB

DESIGN DATA
ETHYLENE FRACTIONATOR REFLUX DRUM
ITEM NO. 300-VV-HW-4002

डिजाइन डाटा
ईथीलीन फ्रेक्शनेटर रिफ्लक्स ड्रम
आइटम नम्बर 300-वीवी-एचडब्लू-4002

DRAWING NUMBER
डाईग नम्बर
B957-300-80-42-DS-3155 REV B
SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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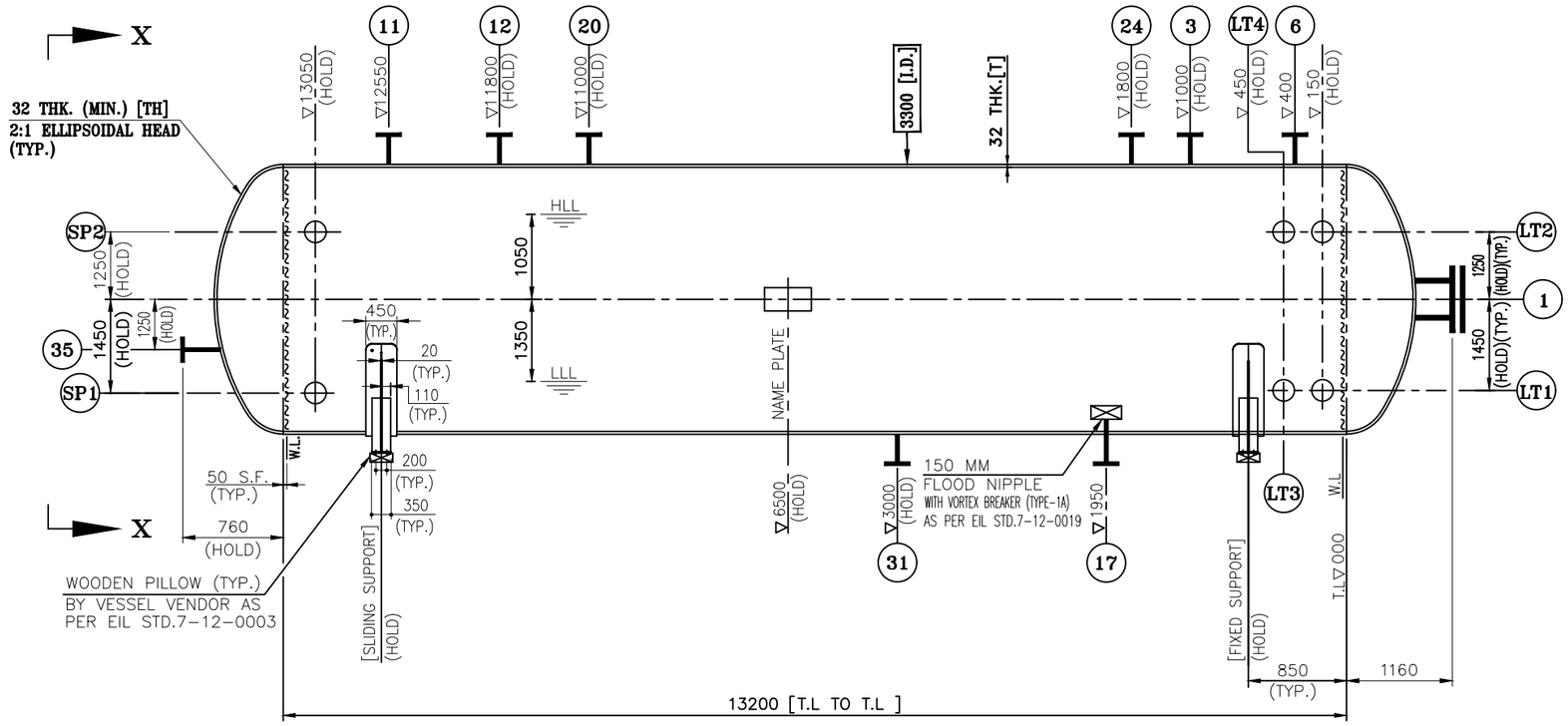
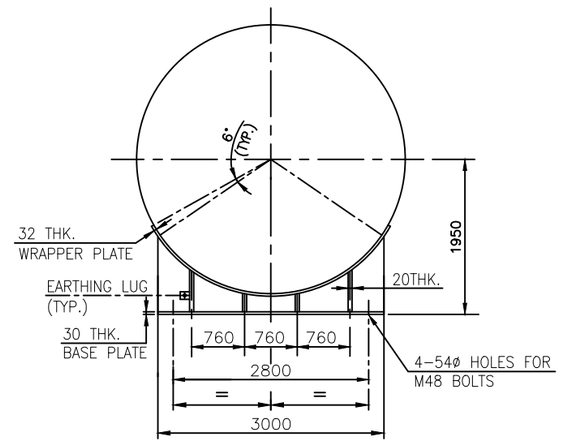
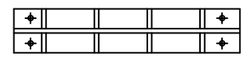


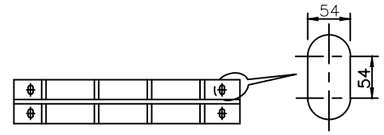


VIEW X–X

(NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



HOLES FOR FIXED SUPPORT



HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	19.08.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
A	11.08.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	

VESSEL DESIGN DATA
ETHYLENE FRACTIONATOR
REFLUX DRUM
ITEM NO. 300-VV-HW-4002

वेसल डिजाइन डाटा
ईथीलीन फ्रेक्शनेटर
रिफ्लक्स ड्रम
आइटम नम्बर 300-वीवी-एचडब्लू-4002

DRAWING NO. B957-300-80-42-DS-3155 | REV. B
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS: B957-300-79-41-DS-1265 REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेक्शन	पैड	सर्विस
1	1	600	20 THK.	300	WN	RF	SEE DWG.	300X T	MANHOLE + BF + GASKET + BOLTING
3	1	250	80	300	WN	RF	2600	135X T	VENTILATION NOZZLE
6	1	100 (H)	160	300	WN	RF	2600	60X T	VAPOR OUTLET TO DRY FLARE/PSV
7	1	80	160	300	WN	RF	2600	45X T	VAPOR OUTLET TO 300-EE-00-4106
11	1	750	20 THK.	300	WN	RF	2600	380X T	FEED FROM 300-EE-00-4105A-D
12	1	80	160	300	WN	RF	2600	45X T	FEED FROM 300-EE-00-4106
17	1	900	20 THK.	300	WN	RF	2600	455X T	LIQUID BOTTOM OUTLET TO 300-PA-CF-4102A/B
20	1	200 (H)	80	300	WN	RF	2600	110X T	MIN. FLOW RETURN FROM 300-PA-CF-4102A/B / 300-PA-CF-4104A/B
24	1	200 (H)	80	300	WN	RF	2600	110X T	PUMP VENT RETURN FROM 300-PA-CF-4102A/B / 300-PA-CF-4104A/B
27	1	150	80	300	WN	RF	2600	85xT	LIQUID START UP (PROPYLENE FILL) FROM HP PROPYLENE
30	1	50	160	600	WN	RF	2600	-	DEINVENTORY / DRAIN FROM 300-VD-00-4101A/B
31	1	80	160	300	WN	RF	2400	45xT	DRAIN
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION + B.F.
LT 1-2	2	50 (H)	160	300	WN	RF	2350	-	LEVEL TRANSMITTER
SP 1-2	2	50 (H)	160	300	WN	RF	2350	-	STAND PIPE

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
11. VESSEL SHALL BE SUBJECTED TO DRY OUT CONDITIONS OF 7.0 Kg/Cm²(g) AT 80ºC.
12. STANDARD FLANGES SHALL BE PRODUCED TO FINE GRAIN PRACTICE MEETING REQUIREMENT OF UCS 66 (C)(1)(-a) OF ASME SEC VIII DIV.1.
13. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
14. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
15. NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKET.
16. ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-)29ºC WITH MIN. ENERGY VALUE AS PER FIG. UG84.1 OF ASME SEC. VIII DIV.1.
17. HOT INSULATION (IH) OF 25mm ROCKWOOL.
18. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	STD. SPEC. FOR HARDNESS REQUIREMENT OF SMED	6-15-0091
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES AS MARKED
X	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	FIXED AND SLIDING SUPPORT		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	19.6
DESIGN PRESSURE (kg/cm²g)	INT. 24.5 EXT. NIL
WORKING TEMPERATURE (°C)	44
DESIGN TEMPERATURE (°C)	(-)29/65
MDMT (°C)	(-29)
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-13)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.470 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M³)	270.6
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-10)
INSULATION THICKNESS (mm) (IH)	25 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[ ] YES [X] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	31.85
INSPECTION BY	[X] EIL [ ] CIB TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्स्ट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.60 (#)
REINFORCEMENT PAD / INSERT PAD	SA 516 Gr.60 (#)
HEADS	SA 516 Gr.60 (#)
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.60 (#)
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT~~/ SUPPORT	SA 516 Gr.60 (#)
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 Gr.60 (#)/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	SA 516 Gr.60 (#)/ SA 106 GR.B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60 (#)/ IS 2062 GR. E 250 QUALITY BR/B0
WRAPPER PLATE	SA 516 Gr.60 (#)
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.60 (#)

 # MATERIAL SHALL BE IMPACT TESTED AS PER CODE/SPEC. REQUIREMENTS.

SPECIAL SERVICE : --

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एप्रौक्सिमेंट वजन)

ERECTION	135000	OPERATING	270000
HYDROTEST(SHOP)	405000	HYDROTEST (FIELD)	415000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	01.09.2025	ISSUED FOR BIDS / ENGG.	AS	CS/VIVEK	PB

DESIGN DATA

PROPYLENE FRACTIONATOR
REFLUX DRUM

ITEM NO. 300-VV-HW-4101

डिजाइन डाटा

प्रोपिलीन फ्रैक्शनाटर रिफ्लक्स ड्रम

आइटम नम्बर 300-वीवी-एचडब्ल्यू-4101

DRAWING NUMBER / डाईग नम्बर: **B957-300-80-42-DS-3156** REV: A

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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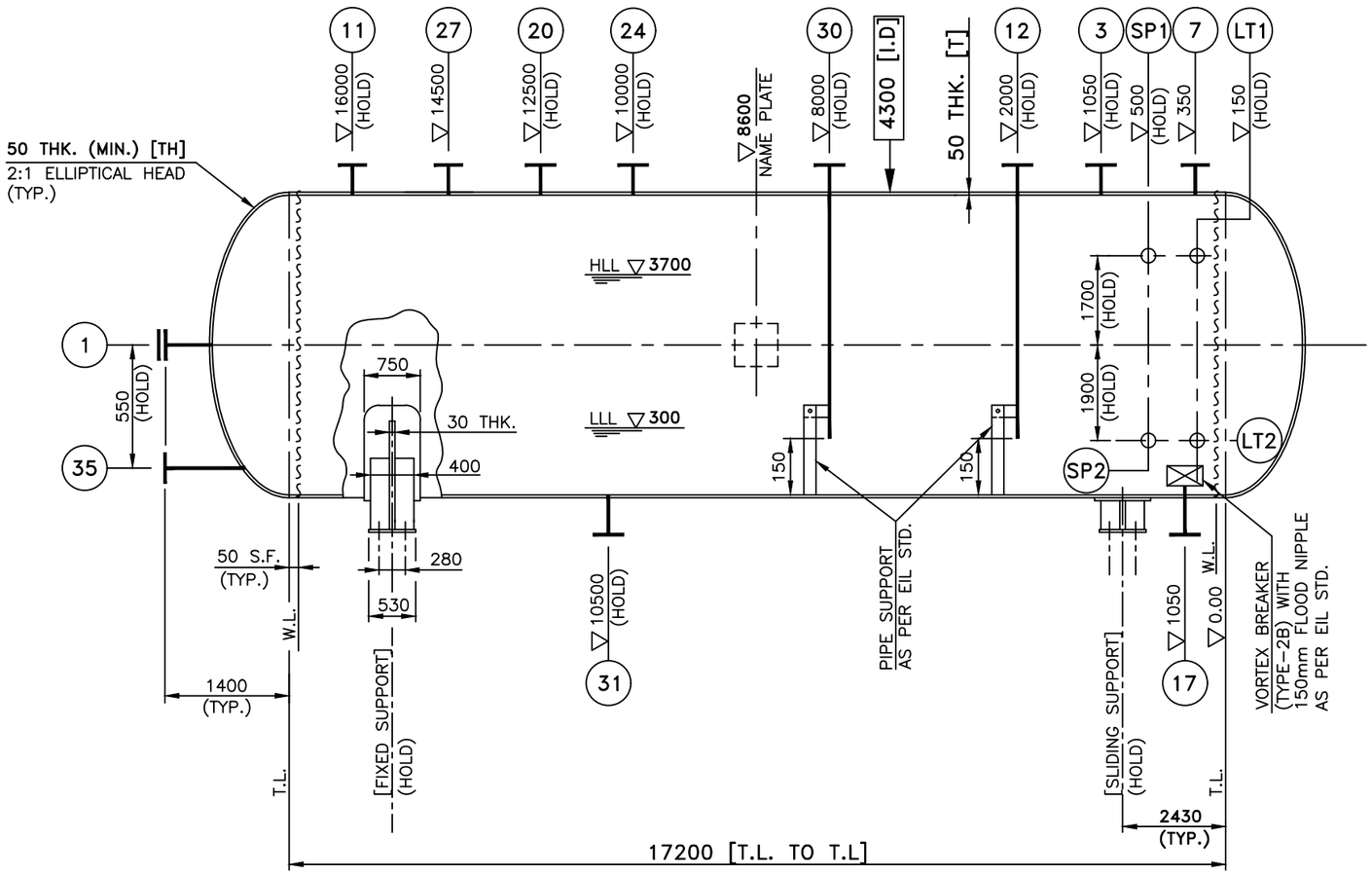
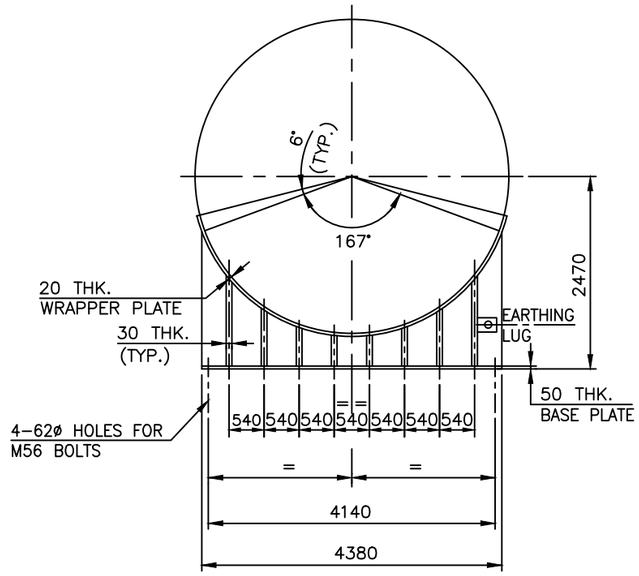
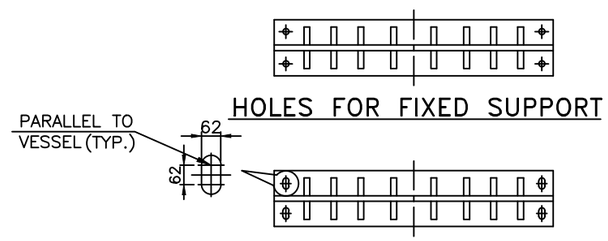




END VIEW

(NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



HOLES FOR FIXED SUPPORT

HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	05.09.2025	ISSUED FOR BIDS/ENGG.	AS	CS/VIVEK	PB	

VESSEL DESIGN DATA
PROPYLENE FRACTIONATOR REFLUX DRUM
ITEM NO. 300-VV-HW-4101

वेसेल डिज़ाइन डाटा
प्रोपिलीन फ्रैक्शनाटर रिफ्लक्स ड्रम
आइटम नम्बर 300-वीवी-एचडब्ल्यू-4101

DRAWING NO. B957-300-80-42-DS-3156 | REV. A
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
1	1	600	14 THK	150	WN	RF	SEE DWG.	300X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
3	1	200	80	150	WN	RF	1720	95X T	VENTILATION NOZZLE
7	1	80 (H)	160	300	WN	RF	1720	40X T	VAPOR OUTLET TO WET FLARE/PSV/300-VV-VI-2002
11	1	300	14 THK	150	WN	RF	1720	135X T	FEED FROM 300-EE-00-4202
12	1	400	14 THK	150	WN	RF	1720	250X T	FEED FROM 300-CC-00-4201 (HOT VAPOR BYPASS)
17	1	250	80	150	WN	RF	1720	115X T	LIQUID BOTTOM OUTLET TO 300-PA-CF-4202 A/B
20	1	100 (H)	120	300	WN	RF	1720	50X T	MIN. FLOW RETURN FROM 300-PA-CF-4202 A/B
22	1	100 (H)	120	300	WN	RF	1720	50X T	PUMP VENT RETURN FROM 300-PA-CF-4202 A/B
31	1	80	160	300	WN	RF	1720	40X T	DRAIN
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	1720	-	LEVEL GUAGE MAGNETIC (SS)
LT 1-2	2	50 (H)	160	300	WN	RF	1720	-	LEVEL TRANSMITTER (DP)

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
SEISMIC (MC)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. EQUIPMENT SHALL BE SUBJECT TO STEAM OUT AT 0.5Kg/cm2(g) @190°C.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	-
LADDERS/PLATFORM CLEATS	-
PIPE SUPPORT CLEATS	-
TRAY SUPPORT AND BOLTING BARS	-
DEMISTER DATA SHEET	-
SKETCH FOR MONKEY LADDER	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES 20 ,22, LT 1-2 & LG 1-2
	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	FIXED/SLIDING SUPPORT		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE	(kg/cm²g)	3.5
DESIGN PRESSURE	(kg/cm²g)	INT. 6.5 EXT. --
WORKING TEMPERATURE	(°C)	40
DESIGN TEMPERATURE	(°C)	65
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 0.85 HEAD / CONE 1
RADIOGRAPHY		SHELL SPOT HEAD / CONE FULL
POST WELD HEAT TREATMENT		AS PER CODE / SPEC.
HEAT TREATMENT		AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		0.582 (AT OPERATING TEMP.)
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	46.1
PAINTING/CLEANING		(NOTE-11)
INSULATION THICKNESS (mm) (IH)		25 (ROCKWOOL) ☐ HOT ☐ COLD
FIRE PROOFING CLEATS		☐ YES ☒ NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)		8.45
INSPECTION BY		☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / ~~BOOT~~	SA 516 Gr.70
REINFORCEMENT PAD ~~/ INSERT PAD~~	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	SA 516 GR.70
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 Gr B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/IS 2062 GR.E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

SPECIAL SERVICE : -

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	12500	OPERATING	34000
HYDROTEST(SHOP)	58600	HYDROTEST (FIELD)	59100
NUMBER OF ITEMS :	ONE		

B957-300-79-41-DS-1266 REV.1

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	24.11.2025	ISSUED FOR BIDS / ENGG.	ROHIT	SA/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
DEBUTANIZER REFLUX DRUM	डेबुटनाइज़र रिफ्लक्स ड्रम	B957-300-80-42-DS-3157	A
ITEM NO. 300-VV-HW-4202	आइटम नम्बर 300-वीवी-एचडब्लू-4202	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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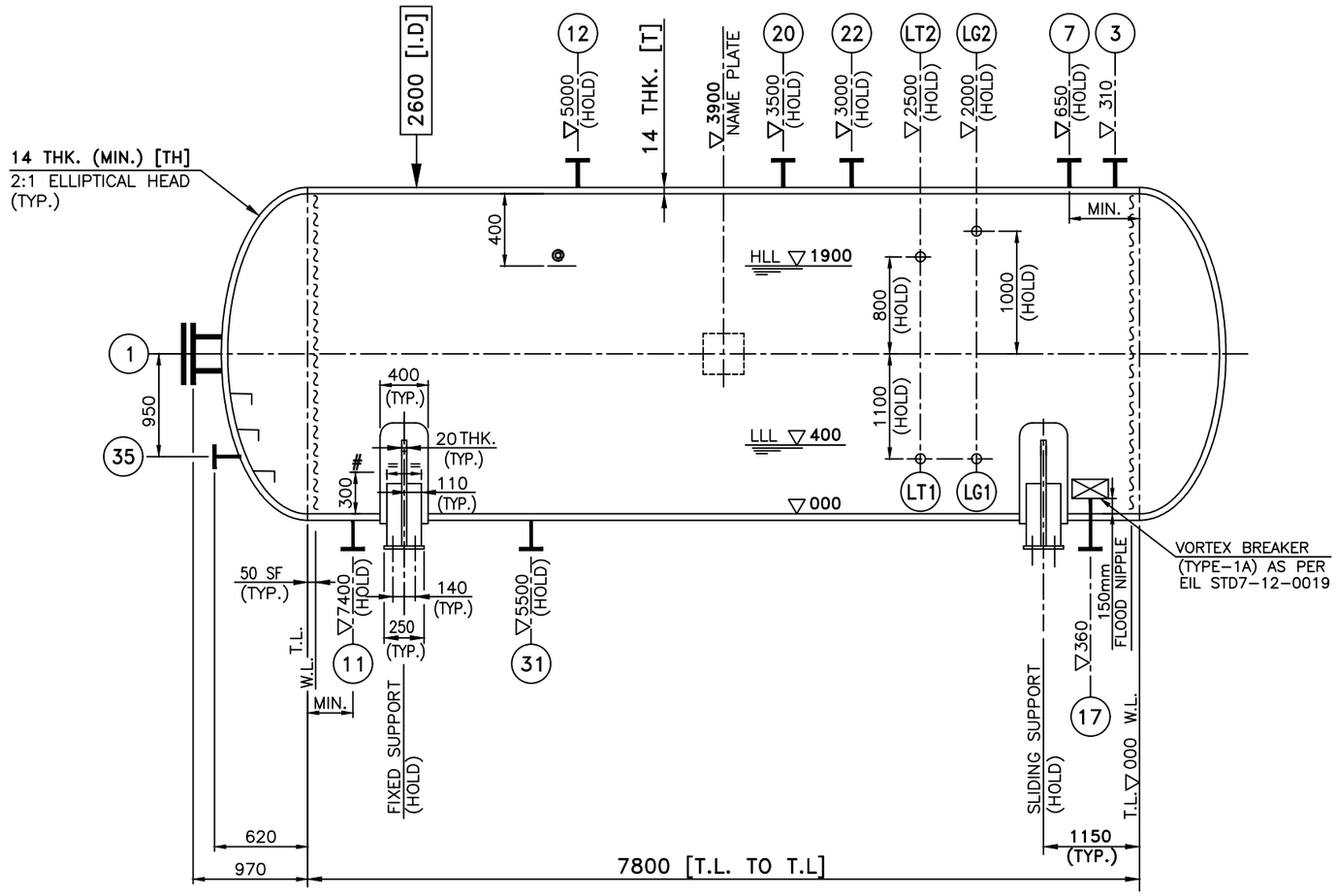
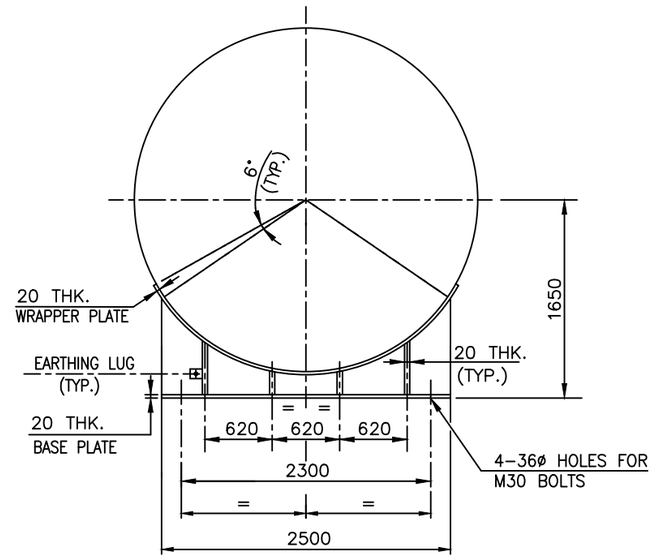


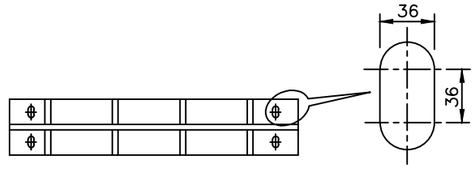


END VIEW

(NOZZLES NOT SHOWN)

(ALL OTHER DIMENSIONS AS PER EIL STD.)

HOLES FOR FIXED SUPPORT



HOLES FOR SLIDING SUPPORT

@: A 800 MM CIRCULAR IMPINGEMENT PLATE 14 (THK.) IS TO BE CENTERED OVER NOZZLE #12 SUPPORTED BY 6 NOS. 14THK.x60 WIDE FLATS

#: A 600 MM CIRCULAR IMPINGEMENT PLATE 14 (THK.) IS TO BE CENTERED OVER NOZZLE #11 SUPPORTED BY 4 NOS. 14THK.x60 WIDE FLATS

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	24.11.2025	ISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB	

VESSEL DESIGN DATA
DEBUTANIZER REFLUX DRUM
ITEM NO. 300-VV-HW-4202

वेसेल डिजाइन डाटा
डेबुटनाइज़र रिफ्लक्स ड्रम
आइटम नम्बर 301-वीवी-एचडब्लू-4202

DRAWING NO.	REV.
B957-300-80-42-DS-3157	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS B957-300-79-41-DS-1267 REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
5 A-B	2	200	80	150	WN	RF	560	95X T	HANDHOLE + BF + GASKET + BOLTING
8	1	50	160	300	WN	RF	SEE DWG.	-	VENT
11	1	150	80	300	WN	RF	560	70X T	FEED FROM 300-EE-00-4201A/B
17	1	150	80	300	WN	RF	SEE DWG.	85X T	LIQUID BOTTOM OUTLET TO LP COND. HEADER
35	1	50	160	300	WN	RF	510	-	UTILITY CONNECTION
LG 1-2	2	50(H)	160	300	WN	RF	510	-	LEVEL GAUGE MAGNETIC (SS)
LT1	1	50(H)	160	300	WN	RF	510	-	LEVEL TRANSMITTER (DP)

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
X	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LG 1-2 & LT1
X	NOZZLE ELEVATIONS LG 1-2 & LT1		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	3.0
DESIGN PRESSURE	(kg/cm^2g)	INT. 7 EXT. F.V.
WORKING TEMPERATURE	(°C)	143
DESIGN TEMPERATURE	(°C)	240
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 0.85 HEAD 1
RADIOGRAPHY		SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT		AS PER CODE / SPEC.
HEAT TREATMENT		HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		0.923 AT OPERATING TEMPERATURE
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	0.52
PAINTING/CLEANING		AS PER JOB SPECIFICATION (NOTE-10)
INSULATION THICKNESS (mm) (IH)		40 [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		9.1
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	IS 2062 GR. E 250 QUALITY BR/B0
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	-
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : --

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	750	OPERATING	1100
HYDROTEST(SHOP)	1300	HYDROTEST (FIELD)	1300
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	09.09.2025	ISSUED FOR BIDS / ENGG.	ROHIT	SA/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
CONDENSATE POT FOR 300-EE-00-4201A/B	कन्डनसेट पॉट फॉर 300-ईई-00-4201ए/बी
ITEM NO. 300-VV-VW-4203	आइटम नम्बर 300-वीवी-वीडब्ल्यू-4203

DRAWING NUMBER डाईग नम्बर	REV
B957-300-80-42-DS-3158	A
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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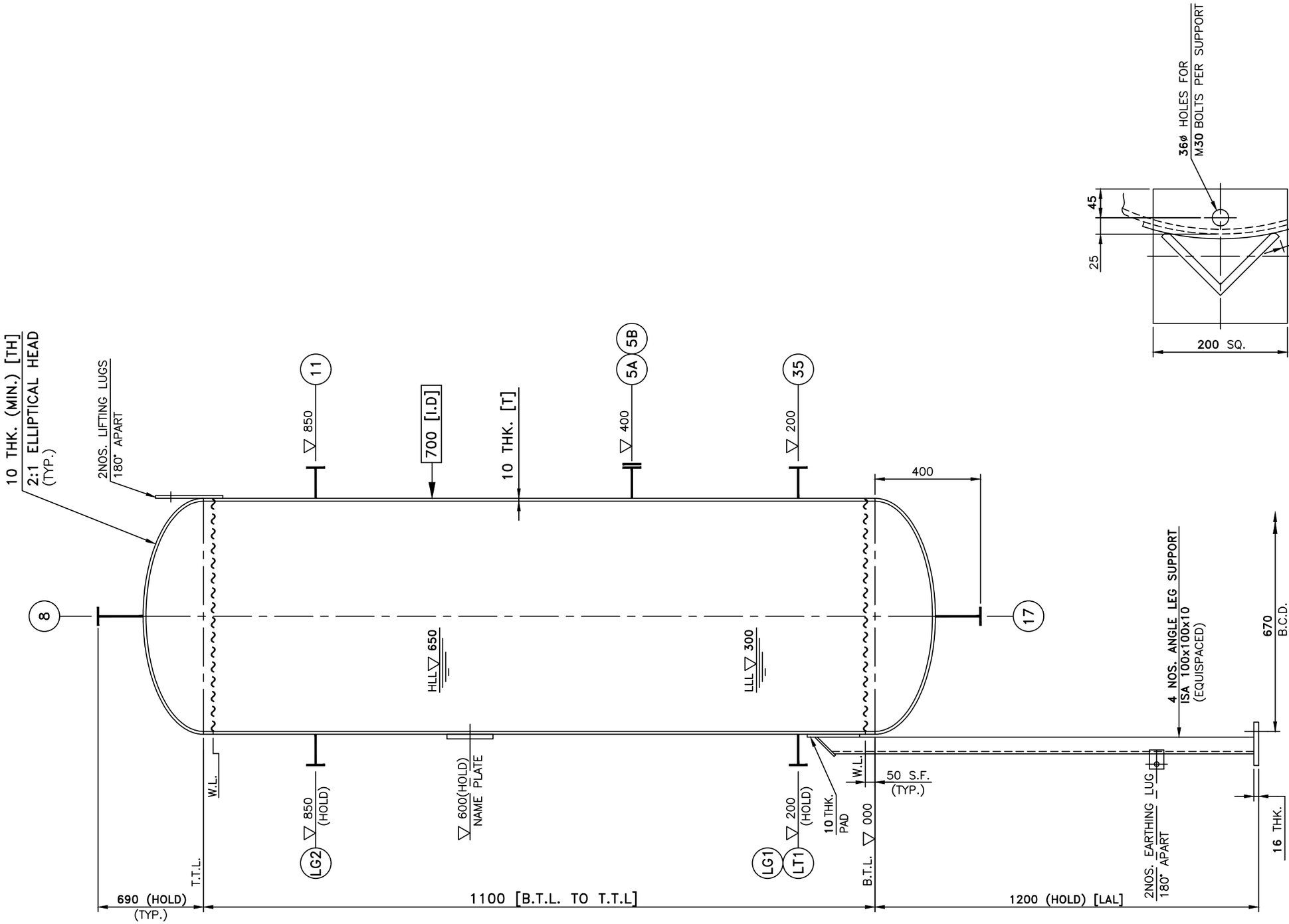

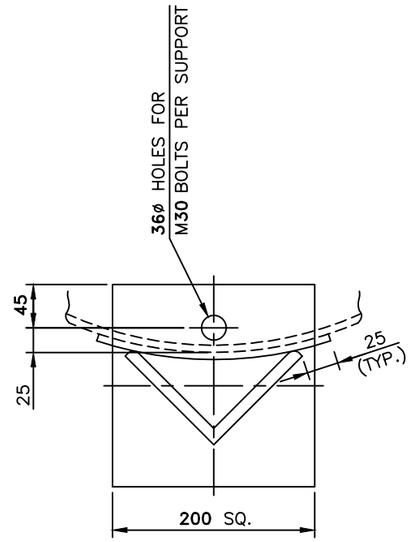

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	09.09.2025	ISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB	

VESSEL DESIGN DATA
CONDENSATE POT FOR 300-EE-00-4201A/B
ITEM NO. 300-VV-VW-4203

वेसल डिजाइन डाटा
कन्डनसेट पॉट फॉर 300-ईई-00-4201ए/बी
आइटम नम्बर 300-वीवी-वीडब्ल्यू-4203

DRAWING NO.	REV.
B957-300-80-42-DS-3158	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS B957-300-79-41-DS-1232 REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
1	1	600	14 THK.	150	WN	RF	SEE DWG.	200X T	MANHOLE+BF+GASKET+BOLTING+HINGE
3 A-B	2	600 (H)	14 THK.	150	WN	RF	SEE DWG.	200 X T	MOUNT FLANGE FOR PUMP 300-PA-CF-4210A/B
PD A-B	2	100 (H)	BY PUMP VENDOR						PUMP DISCHARGE
7	1	80	160	300	WN	RF	SEE DWG.	-	VAPOR OUTLET TO WET FLARE
8	1	200	80	150	WN	RF	SEE DWG.	95X T	VENT
11	1	200	80	150	WN	RF	SEE DWG.	110X T	FEED FROM HC DRAIN HEADER
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
36	1	50	160	300	WN	RF	SEE DWG.	-	PRESSURE GAUGE
40	1	50	160	300	WN	RF	SEE DWG.	-	TEMPERATURE INDICATOR
LT1	1	100 (H)	160	300	WN	RF	SEE DWG.	50x T	LEVEL TRANSMITTER (GWR)
LT2	1	150 (H)	120	300	WN	RF	SEE DWG.	70x T	LEVEL TRANSMITTER (RADAR)
50	1	50	160	300	WN	RF	SEE DWG.	-	NITROGEN INLET (BLANKETING)
S1	1	450	14 THK.	150	WN	RF	SEE DWG.	170xT	MOUNTING NOZZLE + BF + GASKET + BOLTING FOR 40 & 50
S2	1	500	14 THK.	150	WN	RF	SEE DWG.	190xT	MOUNTING NOZZLE + BF + GASKET + BOLTING FOR 7, 35 & 36

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ~~ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.~~
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). ~~FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.~~
4 (B). ~~FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.~~
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES SHALL BE STIFFENED WITH 4 NOS. 100 x 10 THK FLATS AT 90 DEG.APART. MANHOLE,PUMP NOZZLE AND MOUNTING NOZZLES SHALL BE STIFFENED WITH 8 NOS 10THKx R.F PAD WIDE FLATS EQUISPACED.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES / REDUCING FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.EXTERNAL COATING SHALL BE AS PER TABLE 10.2 OF JOB SPECIFICATION.
13. THE VESSEL SHALL BE LOCATED IN RCC PIT AND SAND PACKED WITH VIBRO COMPRESSION WITH 100mm THK OF LEAN CONCRETE ON TOP (BY OTHERS).
14 (a). SIZE OF SUMP1-2 & NOZZLE P1-2 IS UNDER HOLD & SHALL BE AS CONFIRMED BY PUMP VENDOR.
14 (b). PUMP NOZZLE COVER / BLIND FLANGE WITH PUMP ASSEMBLY, NOZZLES PDA-B,BOLTING & GASKET SHALL BE SUPPLIED BY PUMP SUPPLIER.
15. CATHODIC PROTECTION IS BY OTHERS. HOWEVER,CLIP FOR THE SAME TO BE PROVIDED BY VENDOR.
16. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED/BOLTED CS INTERNAL SHALL BE 12mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
17. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190 ºC.
18. LIFTING LUG FOR HANDLING OF VESSEL SHALL BE DESIGNED (CONSIDERING IMPACT FACTOR 1.5) AND PROVIDED BY VENDOR. INDICATIVE DETAILS ARE FURNISHED ON SHEET-3.
19. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
20. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	STD. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC FOR HARDNESS REQUIREMENT	6-15-0091
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
X	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038
X	STILL WELL FOR LEVEL TRANSMITTER (RADAR TYPE) FOR BURIED VESSEL	7-12-0039

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	STILL WELL		PIPE DAVIT
X	SUMP DIAMETER, LENGTH		PACKING SUPPORT
X	BURIED HEIGHT		

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	0.2
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. -
WORKING TEMPERATURE (°C)	AMB.-120
DESIGN TEMPERATURE (°C)	150
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-19)
HEAT TREATMENT	HEAD: AS PER CODE /SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.798
WIND SPECIFICATION	IS 875
SEISMIC	IS 1893 + SITE SPECTRA
CAPACITY (M^3)	52
PAINTING/CLEANING	REFER AS PER JOB SPEC.
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/BOOT	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / BLIND FLANGE	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
SUPPORT	SA 516 Gr.70
SUPPORT BASE	-
INTERNAL PARTS (WELDED)	SA 516 Gr.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70
WRAPPER PLATE	SA 516 Gr.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
LIFTING LUG	SA 516 Gr.70
STIFFENER	SA 516 Gr.70
STILL WELL FOR LT2	SS304L

CATHODIC PROTECTION REQUIRED

@ WITHOUT PUMP ASSEMBLY

SPECIAL SERVICE : BENZENE/AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	23600@	OPERATING	62400@
HYDROTEST(SHOP)	75200@	HYDROTEST (FIELD)	75200@
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	09.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB

DESIGN DATA: DEBUTANIZER AREA HC DRAIN DRUM
ITEM NO.: 300-VV-HW-4210

डिजाइन डाटा: डेब्यूनाइजर एरीआ एचसी ड्रैन ड्रम
आइटम नम्बर: 300-वीवी-एचडब्ल्यू-4210

DRAWING NUMBER / डाईग नम्बर: **B957-300-80-42-DS-3159** REV: A
SHEET 1 OF 3

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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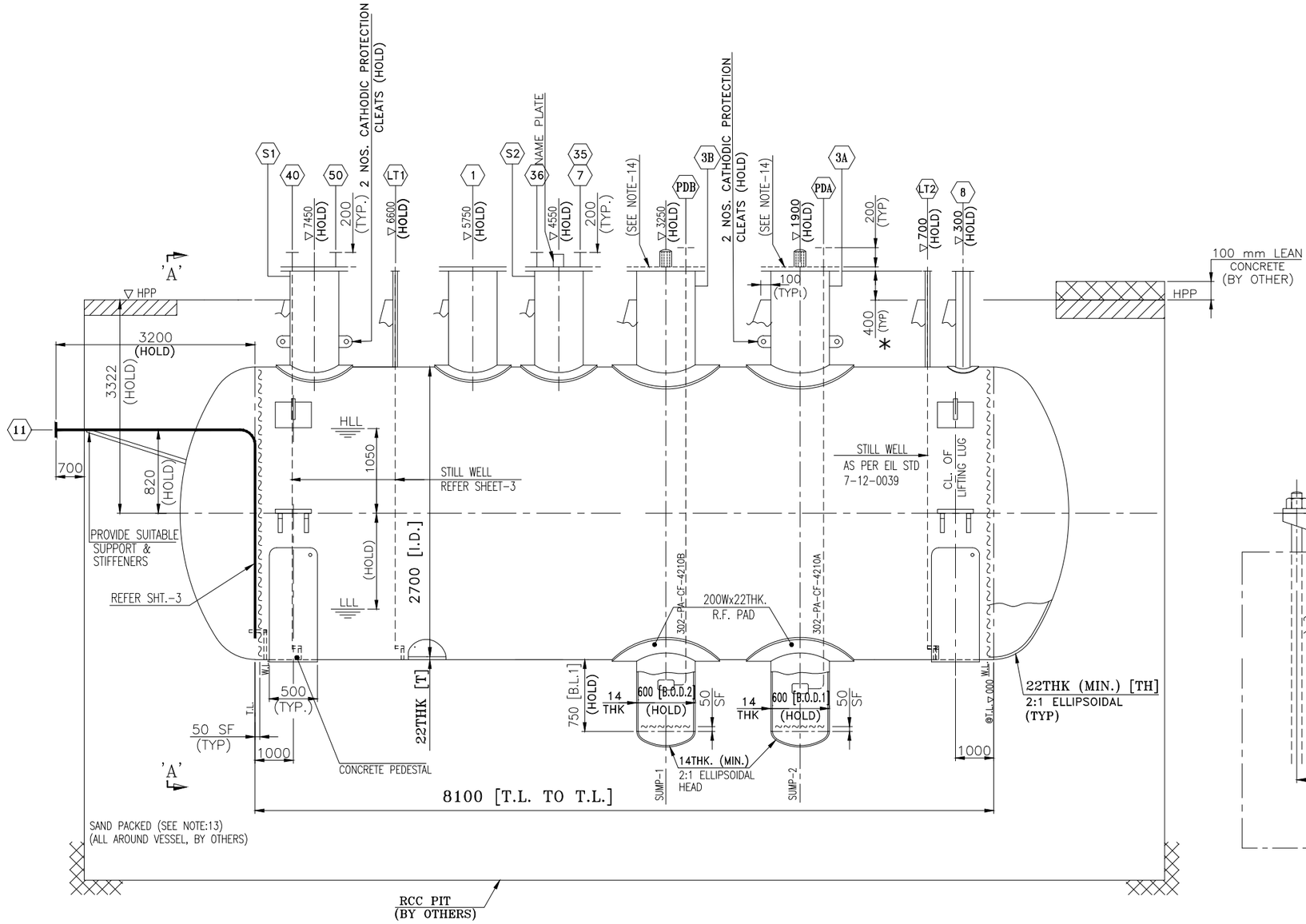
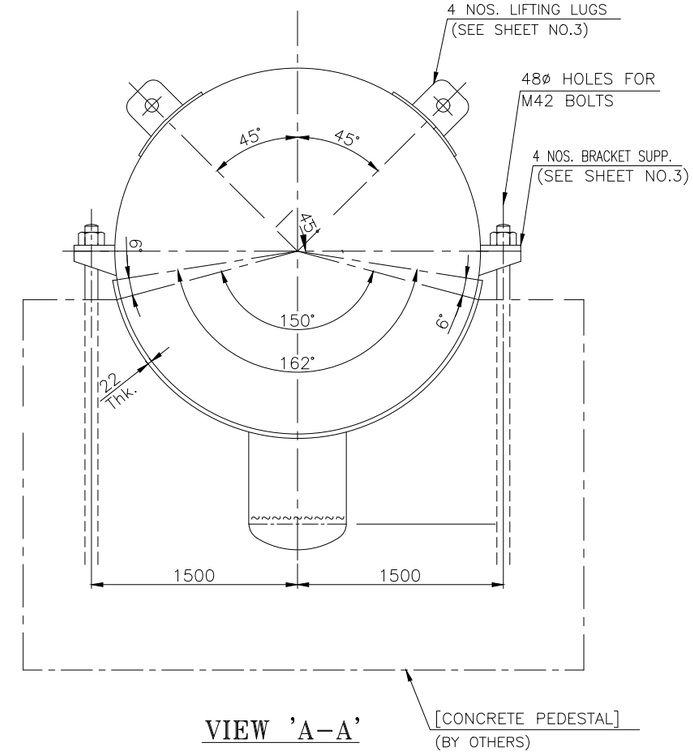
* NOZZLES MAY BE SUITABLY CUT WITH WELD EDGE PREPARATION (WITH SUITABLE COVER)FOR TRANSPORTATION. SUITABLE CUTTING ALLOWANCE IN NOZZLES SHALL BE CONSIDERED TO MAINTAIN THE GIVEN PROJECTION.FINAL ASSEMBLY OF NOZZLES AT SITE SHALL BE BY OTHERS (NOT BY VESSEL FABRICATOR)





VIEW 'A-A'

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	09.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
DEBUTANIZER AREA HC DRAIN DRUM
ITEM NO. 300-VV-HW-4210

वेसेल डिजाइन डाटा
डेब्यूनाइजर एरीआ एचसी ड्रैन ड्रम
आइटम नम्बर 300-वीवी-एचडब्ल्यू-4210

DRAWING NO. B957-300-80-42-DS-3159
REV. A
SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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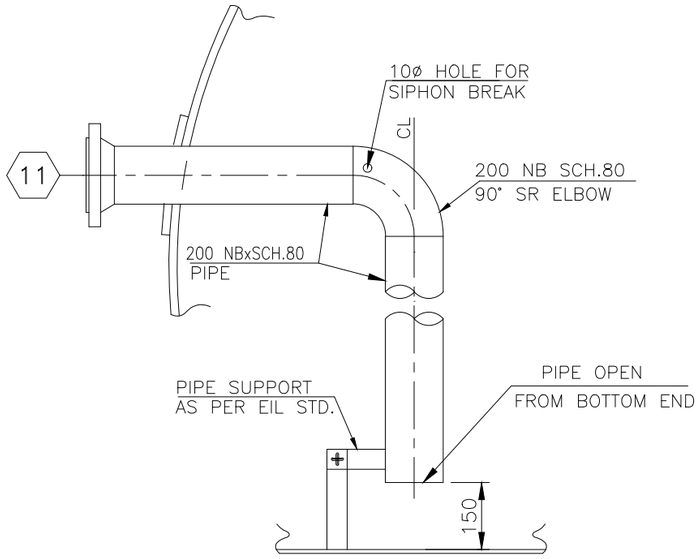
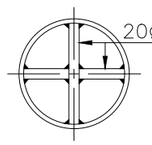
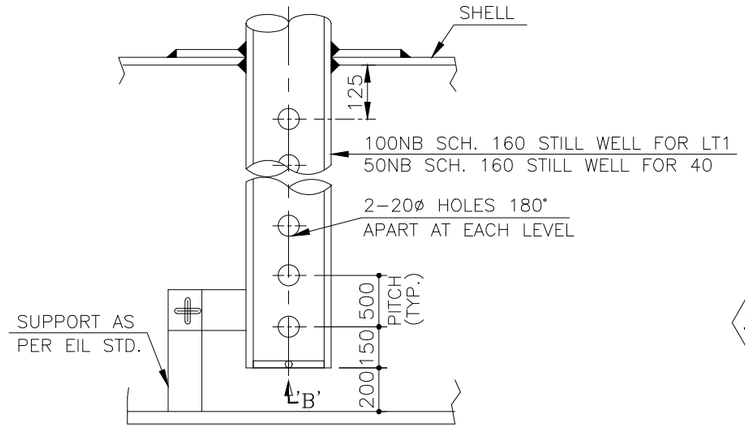


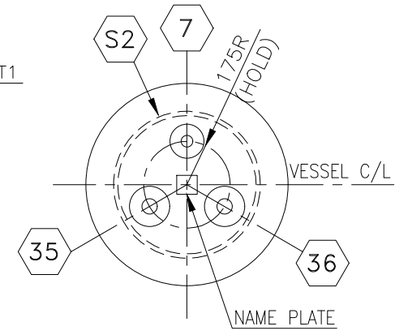
DETAIL OF NOZZLE–F



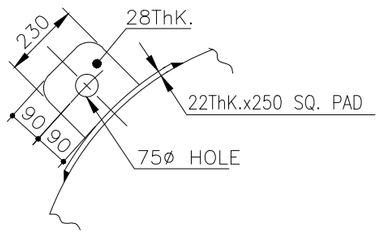
VIEW 'B'
(TYP)



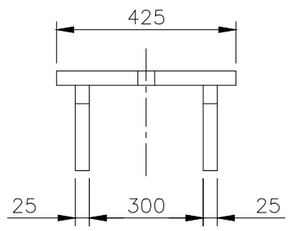
DETAIL OF STILL FOR NOZZLE LT1 & 40
(HOLD)



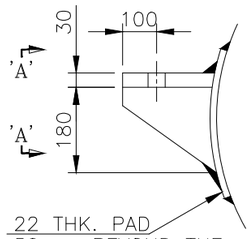
PLAN FOR
MOUNTING NOZZLE S2 (HOLD)
(FOLLOW AS PER NOZZLE ORIENTATION)



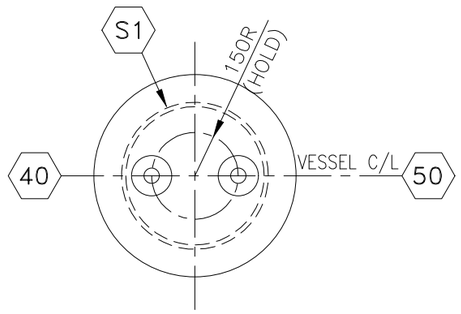
DETAIL OF LIFTING LUG (TYP)



VIEW 'A–A'



DETAIL OF BRACKET SUPPORT (TYP)



PLAN FOR
MOUNTING NOZZLE S1 (HOLD)
(FOLLOW AS PER NOZZLE ORIENTATION)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	09.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
DEBUTANIZER AREA HC
DRAIN DRUM
ITEM NO. 300-VV-HW-4210

वेसेल डिजाइन डाटा
डेब्यूनाइजर एरीआ
एचसी ड्रैन ड्रम
आइटम नम्बर 300-वीवी-एचडब्ल्यू-4210

DRAWING NO.	REV.
B957-300-80-42-DS-3159	A
SHEET 3 OF 3	

1-1641-0503 REV.0 A3-420x297

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PDS B957-300-79-41-DS-1282 REV.2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
1	1	500	14 THK.	300	WN	RF	820	215X T	MANHOLE + BF + GASKET + BOLTING
6	1	50	160	600	WN	RF	SEE DWG.	-	NON CONDENSABLES VENT TO 300-VV-VI-5003
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
D 11	1	300	14 THK.	300	WN	RF	720	135X T	FEED FROM 300-EE-00-3012
D 17	1	300	14 THK.	300	WN	RF	SEE DWG.	135X T	LIQUID BOTTOM OUTLET TO 300-VV-VI-5003
31	1	50	160	600	WN	RF	SEE DWG.	-	DRAIN
35	1	50	160	600	WN	RF	670	-	UTILITY CONNECTION + BF
36	1	50	160	300	WN	RF	670	-	PRESSURE INDICATOR
LT1	1	50 (H)	160	300	WN	RF	670	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50 (H)	160	300	WN	RF	670	-	LEVEL GAUGE MAGNETIC (SS)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)(HOLD)
फॉउन्डेशन लाडिंगं डाटा (ऑपरटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES B UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10 SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
11 DELETED.
12 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
13 NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKET.
14 COLD INSULATION (IC) OF PIR (POLYISOCYANURATE) (BY OTHERS).
15 DRY OUT AT 80°C AND 7.0 kg/cm2g.
16 LIQUID HOLD UP BETWEEN HLL AND LLL IS APPROXIMATELY 20S.
17 ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-)45ºC WITH MIN. ENERGY VALUE AS PER FIG. 3.4 OF ASME SEC.VIII DIV.2.
18 DELETED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS		SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 ED.2023
WORKING PRESSURE (kg/cm²g)	6.33
DESIGN PRESSURE (kg/cm²g)	INT. 18 EXT. -
WORKING TEMPERATURE (°C)	7.3
DESIGN TEMPERATURE (°C)	(-)45/100
MDMT (°C)	(-)45
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.534 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M³)	1.75
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-10)
INSULATION THICKNESS (mm) (IC)	40 (NOTE-14) ☐ HOT ☒ COLD
FIRE PROOFING CLEATS	☒ YES ☐ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	23.4
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70 (#)
REINFORCEMENT PAD	SA 516 Gr.70 (#)
HEADS	SA 516 Gr.70 (#)
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 350 GR.LF2 CL.1
NOZZLE NECK UPTO 250 NB	SA 333 GR.6
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70 (#)
PIPE FITTINGS	SA 420 GR. WPL6
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 320 Gr.L7/ SA 194 GR.7
INTERNAL STUDS/BOLTS/NUTS	-
SUPPORT	SA 333 GR.6
SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70 (#)/ SA 333 GR.6
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL) DIRECTLY WELDED OVER VESSEL	SA 516 GR.70 (#)
CLIPS & ATTACHMENTS (EXTERNAL) WELDED OVER PAD	SA 516 GR.70 #
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70 (#)
LIFTING LUG	SA 516 GR.70 (#)

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

 # MATERIAL SHALL BE IMPACT TESTED AS PER SPEC./CODE

SPECIAL SERVICE : -

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)
DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	2000	OPERATING	D 2700
HYDROTEST(SHOP)	3700	HYDROTEST (FIELD)	3800
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
D	19.01.2026	REVISED & REISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB
C	22.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB
B	12.09.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB
A	20.08.2025	ISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB

DESIGN DATA

LIQUID PROPYLENE ACCUMULATOR FOR 300-EE-00-3012

ITEM NO. 300-VV-VW-5006

डिजाइन डाटा
लिक्विड प्रापलीन एक्यूमुलेटर फार 300-इइ-00-3012
आइटम नम्बर 300-वीवी-वीडब्ल्यू-5006

DRAWING NUMBER / डाईग नम्बर: **B957-300-80-42-DS-3165** REV: D

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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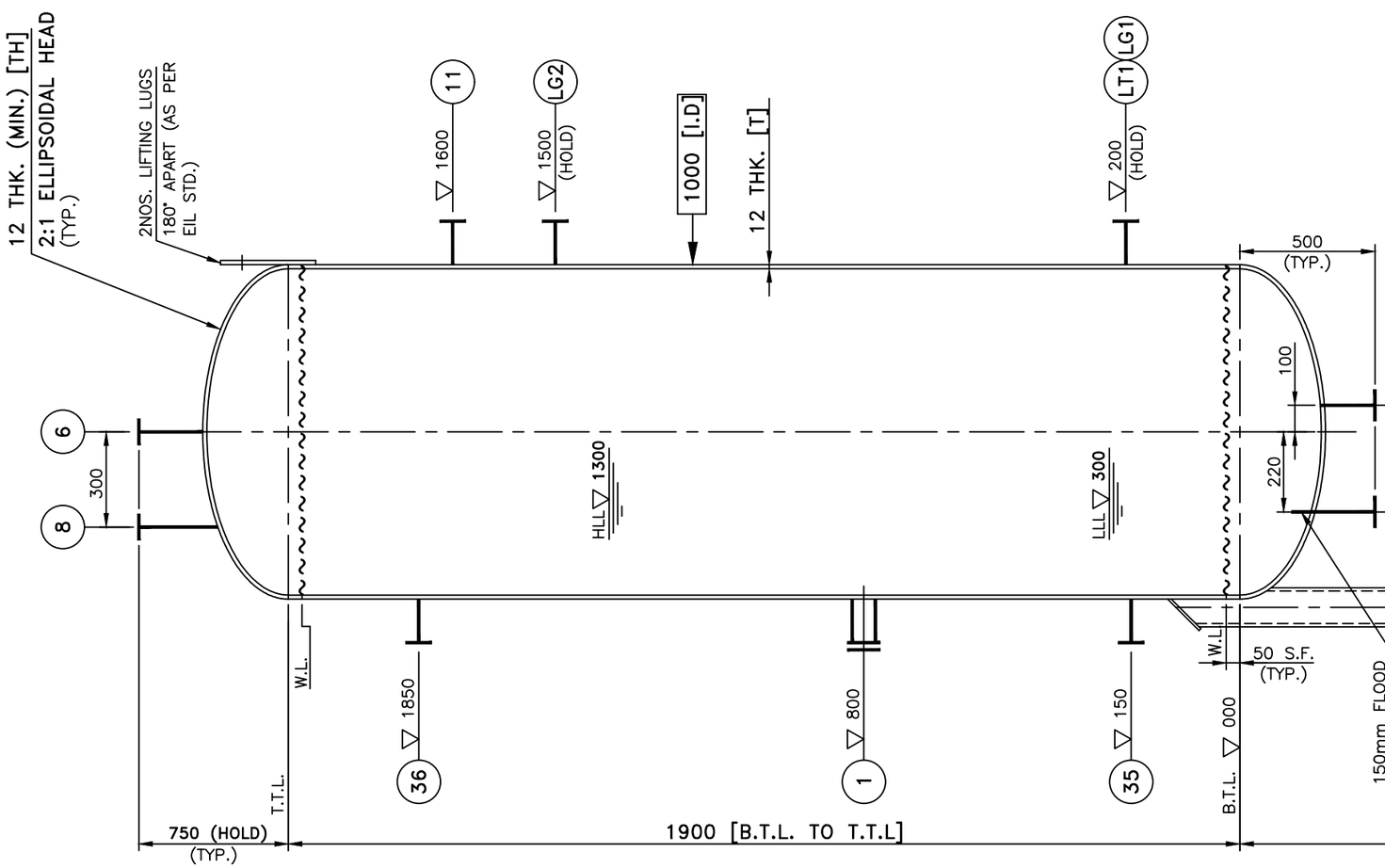

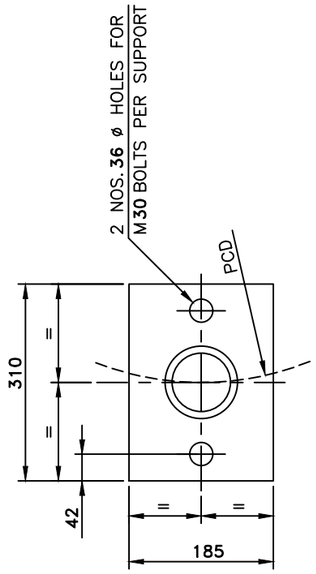

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
D	19.01.2026	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
C	22.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
B	12.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
A	20.08.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
LIQUID PROPYLENE
ACCUMULATOR FOR
300-EE-00-3012
ITEM NO. 300-VV-VW-5006

वेसेल डिजाइन डाटा
लिक्विड् प्रोपीलीन
एक्यूमुलेटर फॉर
300-ईई-00-3012
आइटम नम्बर 300-वीवी-वीडब्ल्यू-5006

DRAWING NO.	REV.
B957-300-80-42-DS-3165	D
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेशन	पैड	सर्विस
1	1	600	14 THK.	300	WN	RF	1070	255X T	MANHOLE + BF + GASKET + BOLTING
6	1	50	160	600	WN	RF	SEE DWG.	-	NON CONDENSABLES VENT TO 300-VV-VI-5002
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	500	14 THK.	300	SRWN	RF	1120	-	FEED FROM 300-EE-00-4003 A-D (REFER SHT.-2 FOR DETAIL OF SRN)
17	1	500	14 THK.	300	WN	RF	SEE DWG.	250X T	LIQUID BOTTOM OUTLET TO 300-VV-VI-5002
31	1	50	160	600	WN	RF	SEE DWG.	-	DRAIN
35	1	50	160	600	WN	RF	920	-	UTILITY CONNECTION
36	1	50	160	300	WN	RF	920	-	PRESSURE INDICATOR
LG 1-2	2	50 (H)	160	300	WN	RF	920	-	LEVEL GAUGE MAGNETIC (SS)
LT1	1	50 (H)	160	300	WN	RF	920	-	LEVEL TRANSMITTER (DP)
AO	1	450 ID	14 THK.	AS PER EIL STD.				225 X T	ACCESS OPENING
SKV 1-3	3	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	22500	4100
WIND	20800	4100

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES B UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10 SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
11 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
12 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
13 NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKET.
14 COLD INSULATION (IC) OF PIR (POLYISOCYANURATE)
15 EQUIPMENT SHALL BE DRY OUT AT 80ºC AND 7.0 kg/cm2g.
16 ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-)29ºC WITH MIN. ENERGY VALUE AS PER FIG. 3.4 OF ASME SEC.VIII DIV.2.
17 STANDARD FLANGES SHALL BE PRODUCED TO FINE GRAIN PRACTICE MEETING REQUIREMENT OF UCS 66 (c)(1)(-a) OF ASME SEC VIII DIV.1.
18 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90º TO LIFTING LUGS / TRUNNIONS) AND BRACING ARRANGEMENT CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 ED.2023
WORKING PRESSURE (kg/cm²g)	4.12
DESIGN PRESSURE (kg/cm²g)	INT. 18 EXT. -
WORKING TEMPERATURE (°C)	(-)4.8
DESIGN TEMPERATURE (°C)	(-)29/100
MDMT (°C)	(-)29
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.552 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M^3)	5.9
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-10)
INSULATION THICKNESS (mm) (IC)	65 (NOTE-16) ☐ HOT ☒ COLD
FIRE PROOFING CLEATS	☒ YES ☐ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	23.4
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70 (#)
REINFORCEMENT PAD	SA 516 Gr.70 (#)
HEADS	SA 516 Gr.70 (#)
SRN	SA 350 LF2 CL.1
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70 (#)
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
SKIRT	SA 516 GR.70 (#)/ IS 2062 GR. E 250 QUALITY BR/B0
SKIRT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70 (#)/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL) DIRECTLY WELDED OVER VESSEL	SA 516 GR.70 (#)
CLIPS & ATTACHMENTS (EXTERNAL) WELDED OVER PAD	SA 516 GR.70 (#)
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70 (#)
LIFTING LUG	SA 516 GR.70 (#)

MATERIAL SHALL BE IMPACT TESTED AS PER CODE/SPEC. REQUIREMENTS

SPECIAL SERVICE : --

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	6000	OPERATING	13700
HYDROTEST(SHOP)	11900	HYDROTEST (FIELD)	16700
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
C	18.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB
B	12.09.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB
A	18.08.2025	ISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB

DESIGN DATA

LIQUID PROPYLENE ACCUMULATOR FOR 300-EE-00-4003 A-D

ITEM NO. 300-VV-VW-5007

डिजाइन डाटा
लिक्विड प्रापलीन एक्यूमुलेटर फार 300-इइ-00-4003 ए-डी
आइटम नम्बर 300-वीवी-वीडब्ल्यू-5007

DRAWING NUMBER / डाईग नम्बर: **B957-300-80-42-DS-3166** REV: C

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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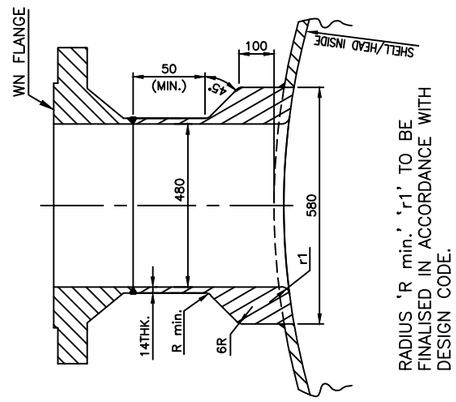
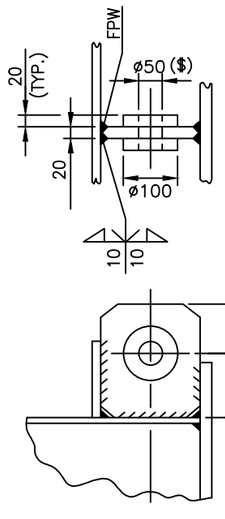


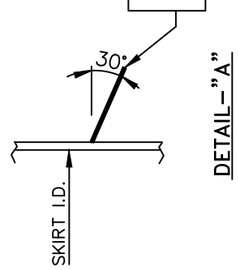
RADIUS 'R min.' 'r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE.

NOZZLE–11

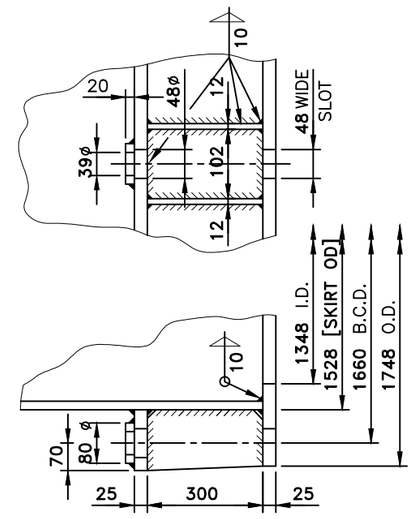


TAILING LUG DETAIL

($) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.

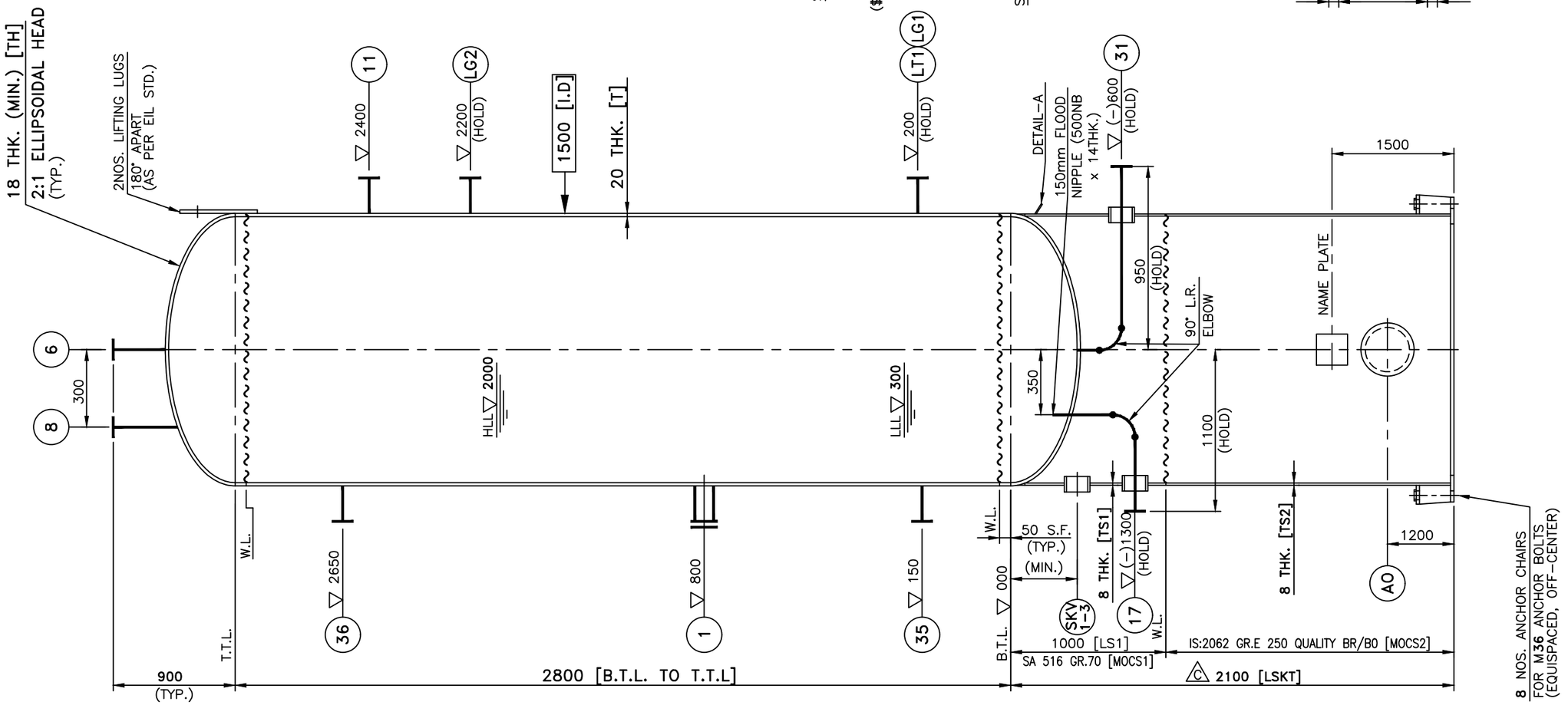


DETAIL–"A"



SKIRT BASE DETAIL

(ALL OTHER DIMENSIONS AS PER EIL STD.)



C	18.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
B	12.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
A	18.08.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
LIQUID PROPYLENE ACCUMULATOR FOR
300-EE-00-4003 A-D
ITEM NO. 300-VV-VW-5007

वेसेल डिजाइन डाटा
लिक्विड् प्रोपीलीन एक्यूमुलेटर फॉर
300-इइ-00-4003 ए-डी
आइटम नंम्बर 300-वीवी-वीडब्ल्यू-5007

DRAWING NO. B957-300-80-42-DS-3166
REV. C
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
1	1	600	14 THK.	300	WN	RF	1740	255 X T	MANHOLE + B.F. + DAVIT
7	1	750	14 THK.	300	WN	RF	SEE DWG.	380 X T	VAPOUR OUTLET TO 300-VV-VI-5002
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	350	14 THK.	300	WN	RF	1690	150 X T	FEED FROM 300-EE-00-4004
12	1	900	14 THK.	300	WN	RF	1790	390 X T	FEED FROM 300-LZ-00-3001-EP-00-18
17	1	450	14 THK.	300	WN	RF	SEE DWG.	225 X T	LIQUID BOTTOM OUTLET TO 300-LZ-00-3001-EP-00-18
31	1	80	160	300	WN	RF	SEE DWG.	45 X T	DRAIN
35	1	50	160	600	WN	RF	1590	-	UTILITY CONNECTION
36	1	50	160	300	WN	RF	1590	-	PRESSURE GAUGE
LG 1-2	2	50 (H)	160	300	WN	RF	1590	-	LEVEL GAUGE MAGNETIC (SS)
LT 1-2	2	50 (H)	160	300	WN	RF	1590	-	LEVEL TRANSMITTER (DP)
AO	1	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	SCH 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉउन्डेशन लोडिगं डाटा (ऑपरटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	89000	10000
WIND	53000	4300

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14. EQUIPMENT SHALL BE SUBJECT TO DRY OUT AT 7 Kg/cm2(g) @80°C.
15. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING AND AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
16. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
17. VENDOR SHALL CARRY OUT SIZING OF DEMISTER AS PER PROCESS DATA FURNISHED IN PDS & SUBMIT THE SAME FOR EIL REVIEW AND SAME SHALL BE INCLUDED IN QUOTED PRICE. PERFORMANCE GUARANTEE OF DEMISTER SHALL BE BY VESSEL VENDOR. REFER EIL SPEC 6-14-0017.
18. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED CS INTERNAL SHALL BE 12mm & BOLTED INTERNAL SHALL BE 9mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
19. ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-) 45°C WITH MIN ENERGY VALUES AS PER FIG.UG-84.1 OF ASME SEC.VIII DIV-1.
20. VENDOR TO PROVIDE WOODEN BLOCK FOR PIPE DAVIT SUPPORT AS PER EIL STD. 7-12-0034.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	GENERAL SPEC. FOR WIRE MESH DEMISTER	6-14-0017
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-0001

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
X	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
X	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
X	DEMISTER DATA SHEET	300-VV-VI-5009
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
X	PROCESS DATASHEET	300-VV-VI-5009

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LG,LT
X	NOZZLE ELEVATIONS LG,LT	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	1.39
DESIGN PRESSURE (kg/cm²g)	INT. 18 EXT. -
WORKING TEMPERATURE (°C)	(-) 27
DESIGN TEMPERATURE (°C)	(-) 45/ 100
MDMT (°C)	(-) 45
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.582 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS 875 (PART-3)
SEISMIC	IS 1893 + SITE SPECTRA (PART-4)
CAPACITY (M³)	38.4
PAINTING/CLEANING	AS PER JOB SPECIFICATION (NOTE-12)
INSULATION THICKNESS (mm)	80 (IC) ☐ HOT ☒ COLD
FIRE PROOFING CLEATS	☒ YES ☐ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	23.4
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.60*
REINFORCEMENT PAD	SA 516 Gr.60*
HEADS	SA 516 Gr.60*
SHELL FLANGES/SR/LWN	-
NOZZLE FLANGES	SA 350 GR.LF2 CL1
NOZZLE NECK UPTO 250 NB	SA 333 GR.6
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.60*
PIPE FITTINGS	SA 420 GR. WPL6
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 320 L7 / SA 194 GR.7 B
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ ~~SUPPORT~~	SA 516 GR.60*/ IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.60* / SA 333 GR.6
INTERNAL PARTS (BOLTED)	SS 304
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60*
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.60*
PIPE DAVIT	SA 106 GR.B
VACUUM STIFFENER	-
LIFITNG LUG	SA 516 GR.60*

* MATERIAL SHALL BE IMPACT TESTED AS PER SPEC./ CODE REQUIREMENT

SPECIAL SERVICE : --

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- INDIAN BOILER REGULATIONS (IBR)
- DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) (HOLD)

ERECTION	23500	OPERATING	48000
HYDROTEST(SHOP)	61900	HYDROTEST (FIELD)	78000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	19.08.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/ VIVEK	PB
A	07.08.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/ VIVEK	PB

DESIGN DATA
LIQUID PROPYLENE ACCUMULATOR FOR 300-LZ-00-3001-EP-00-18

ITEM NO. 300-VV-VI-5009

डिजाइन डाटा
लिक्विड प्रोपाइलिन अक्युमुलेटर फॉर
300-ऐलझेड-00-3001-ईपी-00-18

आइटम नम्बर 300-वीवी-वीआई-5009

DRAWING NUMBER / डाईग नम्बर: **B957-300-80-42-DS-3168** REV: B

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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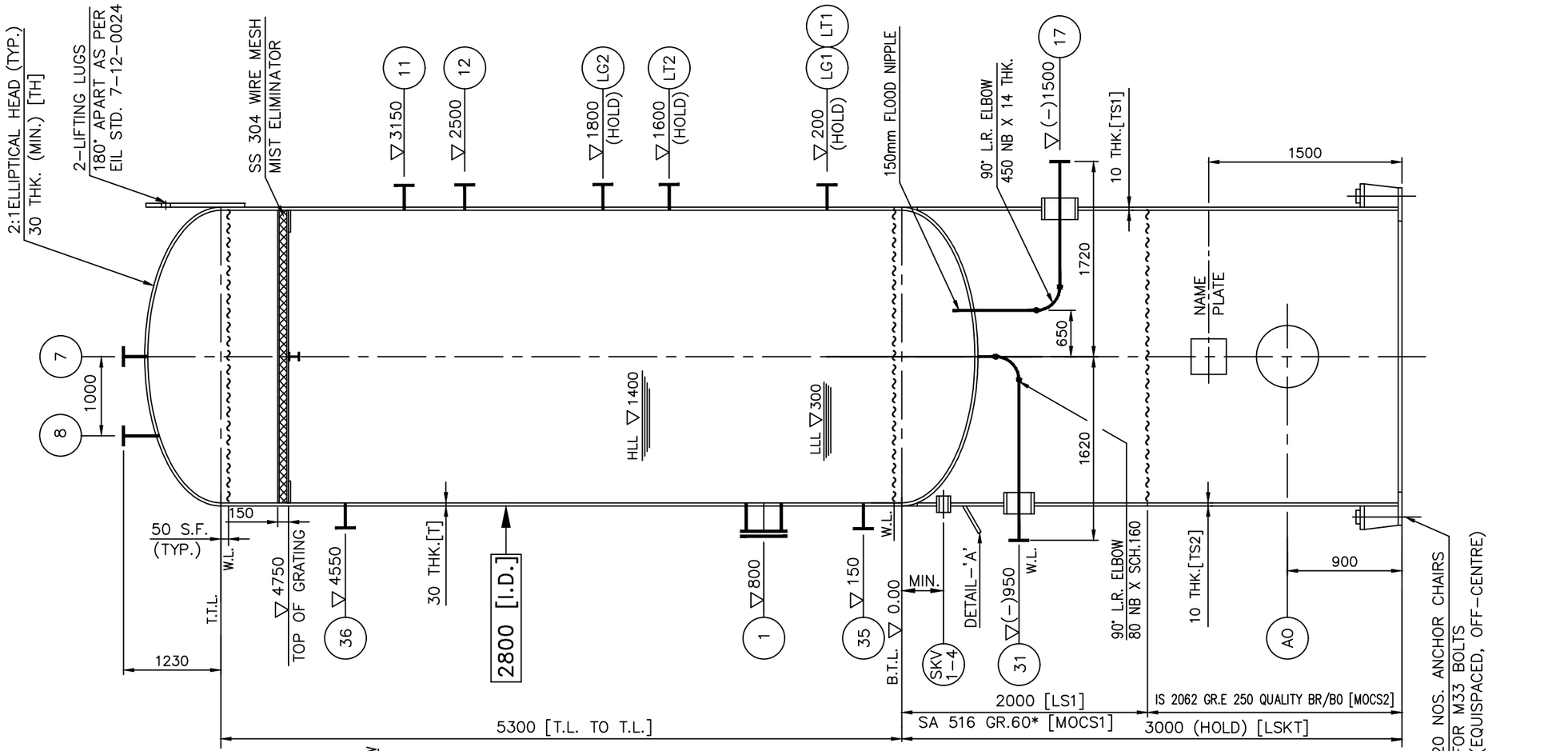
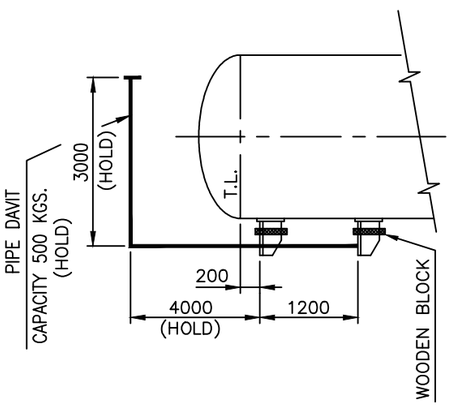
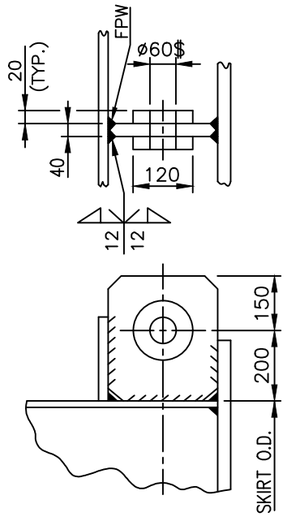




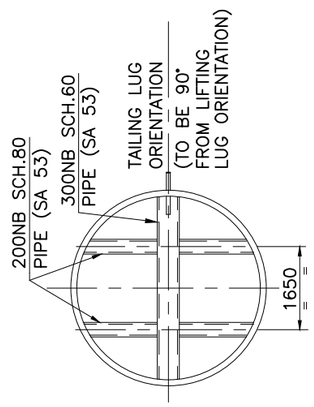
PIPE DAVIT

(ALL OTHER DIMENSIONS AS PER EIL STD.)
(7-12-0023 & 7-12-0034)

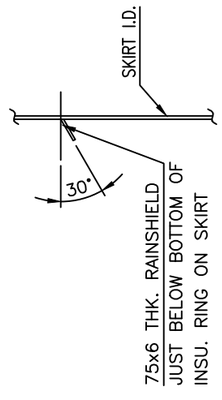


DETAIL OF TAILING LUG

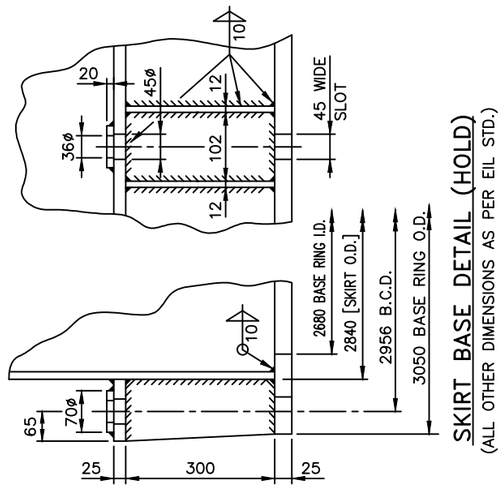
$ VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.



STIFFENING DETAIL OF SKIRT



DETAIL-'A'



SKIRT BASE DETAIL (HOLD)

(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	19.08.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
A	07.08.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	

VESSEL DESIGN DATA
LIQUID PROPYLENE ACCUMULATOR
FOR 300-LZ-00-3001-EP-00-18
ITEM NO. 300-VV-VI-5009

वेसल डिजाइन डाटा
लिक्विड प्रोपाइलिन अक्यूमुलेटर
फॉर 300-ऐलडोइ-00-3001-इपी-00-18
आइटम नम्बर 300-वीवी-वीआई-5009

DRAWING NO. B957-300-80-42-DS-3168 | REV. B

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
1	1	1450 (H)	#	300	SRWN	RF	#	-	MANHOLE + BF
2	1	1450 (H)	#	300	SRWN	RF	#	-	MANHOLE + BF + DAVIT
5	1	200	#	600	SRWN	RF	#	-	DUMP NOZZLE
7	1	1050	#	300	SRWN	RF	#	-	VAPOR OUTLET TO 300-EE-00-2207A/B
8	1	100	-	600	LWN	RF	SEE SHT. 2	-	VENT
11	1	1050	#	300	SRWN	RF	#	-	FEED FROM 300-EE-00-2208
31	1	80	160	600	WN	RF	SEE SHT. 2	-	DRAIN
35	1	50	#	600	LWN	RF	#	-	UTILITY CONNECTION
40 A-C	3	76.2 I.D (H)	#	300	SRLW N	RF	#	-	TEMPERATURE INDICATOR
50	1	100	#	300	SRWN	RF	#	-	CLEANOUT + B.F.
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

'H' DENOTES HOLD

'#' REFER SHEET-3

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉऊडशन लोडिगं डाटा (आपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	355000	34000
SEISMIC		
WIND	118000	10100

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125-250 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 900 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14. FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
15. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
16. EQUIPMENT MAY BE ERECTED IN DRESSED UP CONDITON (I.E AFTER INSTALLATION OF INSULATION) BY OTHERS CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES OF ACTUAL ERECTION WEIGHT.
17. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
18. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
19. VENDOR TO DESIGN & SUPPLY 4 NOS. LIFTING HOOK EQUALLY SPACED ON BLIND FLANGE OF MANHOLE NOZZLE 1 FOR LIFTING.
20. ALL INTERNAL & ITS SUPPORTS (EXCEPT CATALYST & INERT BALLS) SHALL BE DESIGNED & SUPPLIED BY VENDOR.)
21. OPERATING/ DESIGN CONDITION:

OPERATING CONDITON	TEMPERATURE °C S.O.R.	TEMPERATURE °C E.O.R.	PRESSURE, KG/cm2g
1st BED (INLET/ OUTLET)	71.7/82.9	125.1/138.6	23.4
2nd BED (INLET/ OUTLET)	74.3/83.5	125.2/137.0	22.4
3rd BED (INLET/ OUTLET)	76.3/83.0	127.6/135.8	21.4
DESIGN CONDITON	TEMPERATURE °C		PRESSURE, KG/cm2g
300-RB-00-2201 A-C	345		31.5
REGENERATION	EX-SITU		

22. EQUIPMENT SHALL BE SUBJECTED TO DRY-OUT AT 80°C AND 7.0KG/CM^{2}G.
23. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING 1.25 TIMES OF EQUIPMENT ERECTION WEIGHT AND AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
24. WELD QUALITY FOR SKIRT-SHELL/HEAD JUNCTION: NDT SHALL BE CARRIED OUT AS PER TABLE 5.12 (FATIGUE STRENGTH REDUCTION FACTOR OF 1.5, QUALITY LEVEL 3) OF ASME SEC VIII DIV-2.
25. IT SHALL BE ENSURED BY VENDOR THAT FOR NOZZLE ABOVE 600 NB NOZZLE PIPE O.D. SHALL MATCH WITH CORRESPONDING STANDARD FLANGE O.D
26. WIRE MESH SCREEN SHALL BE PROVIDED.
27. VENDOR SHALL DESIGN & SUPPPLY THE DAVIT FOR THE MANHOLE COVER OF NOZZLE 2 WITH IMPACT FACTOR OF 2.0.
28. COMPLETE TOP & BOTTOM GRIDS & SCREEN INCLUDING NUT, BOLT, GASKET AND ITS SUPPORTING ARRANGEMENT TO BE DESIGNED AND SUPPLIED BY EQUIPMENT VENDOR.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
X	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS (FOR GUIDANCE)	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
X	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
X	PDS FOR 300-RB-00-2201A/B/C	300-RB-00-2201A~C
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES 40
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	INSULATION THK./ TYPE	X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm^{2}g)	(NOTE-21)
DESIGN PRESSURE (kg/cm^{2}g)	INT. (NOTE-21) EXT. -
WORKING TEMPERATURE (°C)	(NOTE-21)
DESIGN TEMPERATURE (°C)	(NOTE-21)
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-17)
HEAT TREATMENT	AS PER CODE/SPEC.
OPERATING MEDIUM	ACETYLENE
SP. GRAVITY	-
WIND SPECIFICATION	IS 875 (PART-3)
SEISMIC	IS 1893 + SITE SPECTRA (PART-4)
CAPACITY (M^3)	137
PAINTING/CLEANING	AS PER JOB SPECIFICATION
INSULATION THICKNESS (mm) (IH)	100 (HOLD) [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	43.65
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/BOOT	SA 516 GR.70
REINFORCEMENT PAD/INSERT PLATE	-
HEADS	SA 516 GR.70
SR/LWN	SA 350 GR.LF2 CL.1
NOZZLE FLANGES	SA 350 GR.LF2 CL.1
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 GR.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7/SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ SUPPORT	SA 516 GR.70
SKIRT/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY B
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B / SA 105
INTERNAL PARTS (BOLTED)	SS 304$ B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	SA 106 GR. B
SCREEN	SS 304
LIFTING LUG	SA 516 GR.70
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

$ SS 304L CAN ALSO BE USED B

@ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

NO PLATFORM, LADDER, PIPING SHALL BE SUPPORTED ON THIS EQUIPMENT

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स) (HOLD)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	120000	OPERATING	195000
HYDROTEST(SHOP)	257000	HYDROTEST (FIELD)	280000

NUMBER OF ITEMS : THREE

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	03.09.2025	REVISED & REISSUED FOR	ROHIT	AD/VIKVEK	PB
A	09.06.2025	REVISED AS MARKED.	ROHIT	AD/VIKVEK	PB

DESIGN DATA	डिजाइन डाटा
ACETYLENE CONVERTER	एसिटीलीन कनवर्टर
ITEM NO. 300-RB-00-2201A/B/C	आइटम नम्बर 300-आरबी-00-2201ए/बी/सी

DRAWING NUMBER डाईग नम्बर	REV
B957-300-80-42-DS-3201	B
SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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60 THK.[TH] (MIN.)
2: ELLIPSOIDAL HEAD
(TYP.)

50 S.F.
(TYP.)

T.T.L.
W.L.

60 THK.[T]

W.L.
B.T.L.

20 THK.[TS2]

W.L.

20 THK.[TS1]

1000[LS1]
SA 516 GR.70 [MOCS1]

IS 2062 GR.E 250 QTY.BR/B0 [MOCS2]

7500 [B.T.L TO T.T.L]

5000 [LSKT]
(HOLD)

PIPE DAVIT
(AS PER EIL STD.)
(DAVIT TO BE LOOSE SUPPLIED ALONG WITH BRACKETS)

PIPE DAVIT
CAP. 1000 KGS.
(HOLD)

3000
(HOLD)

200

4000
(HOLD)

1200

2950 | 300 | 1810 | 300 | 2140

1050NB #150 SORF AS PER ASME B16.47
SERIES-B FLANGES (TYP.)

6430
(NOTE-23)

11

U CLAMP SUPPORT
REMOVABLE SUPPORT TO BE DEVELOP & SUPPLIED BY VENDOR
(TYP. FOR NOZZLE 7 & 11)

4400 [I.D.]

3800

3350

2900

40 A
40 B
40 C

SCREEN (REFER NOTE-26 OF PDS) (BY VENDOR)

BOTTOM SUPPORT GRID (BY VENDOR)
(REFER PDS)

INERT BALLS (REFER PDS)
(BY OTHERS)

1070
(NOTE-23)

7

(-)1600

31

75 X 6 THK. RAIN SHIELD JUST BELOW BOTTOM OF INSULATION RING ON SKIRT

30°

SKIRT I.D.

DETAIL-"A"

1800
1100

NAME PLATE

A0
1-2

24 NOS. ANCHOR CHAIRS FOR M36 ANCHOR BOLTS
(EQUISPACED, OFFCENTRED)

1050NB X 25 THK.

MIN.

REFER NOTE-18 OF PDS

1050NB X 25 THK.

MIN.

2540

50

2605

45°

470
(HOLD)

@ ROTATE 120° TO EACH OTHER

2 Nos. LIFTING LUG
180° APART

T.T.L.

1050 NB X 10 THK. PIPE &
90° SR ELBOW (TYP.)

TOP HOLD DOWN GRATING & SCREEN (REFER PDS)
(BY VENDOR)

INERT BALLS (REFER PDS)
(BY OTHERS)

SCREEN (NOTE-26) (BY VENDOR)
(REFER PDS)

CATALYST(REFER PDS)
(BY OTHERS)

5
2633 (HOLD)
REFER NOTE 6 OF PDS

SUPPORT RING
& BEAM

2
1150

35
300
B.T.L.
0.00

MIN.

SKV
1-4

REFER
DETAIL-'A'

100NB X 80NB SCH. 160
REDUCING TEE

EARTHING LUG

SKIRT BASE DETAIL(HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0004)

20
48Ø
12
48 WIDE SLOT
39
102
4300 I.D.
4480 [SKIRT O.D.]
4612 B.C.D.
4700 O.D.
75
100
25
380
25

FPW
20 (TYP.)
Ø115($)
90
275
40
40

DETAIL OF TAILING LUG
($) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.

200 WIDE X 36 THK. CONTINUOUS RING
175
350
SKIRT O.D.

STIFFENING DETAIL OF SKIRT

200NB SCH.80 PIPE (SA 53)
300NB SCH.60 PIPE (SA 53)
TAILING LUG (PARALLEL TO LIFTING EYE ON MANWAY)
1000
1000
1000
1000

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	02.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	
A	09.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	

VESSEL DESIGN DATA
ACETYLENE CONVERTER
ITEM NO. 300-RB-00-2201A-C

वेसल डिजाइन डाटा
एसीटीलीन कनवर्टर
आइटम नम्बर 300-आरबी-00-2201ए/बी/सी

DRAWING NO. B957-300-80-42-DS-3201
REV. B
SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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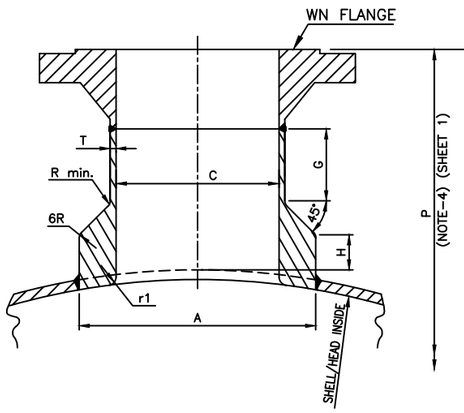

FIG.–1

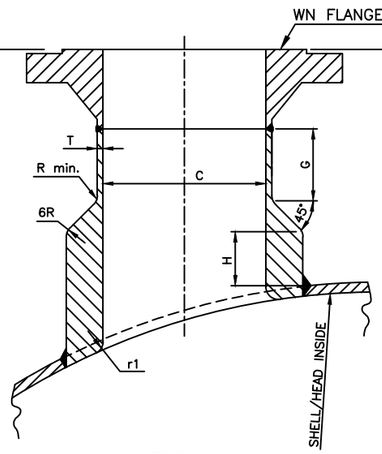

FIG.–2

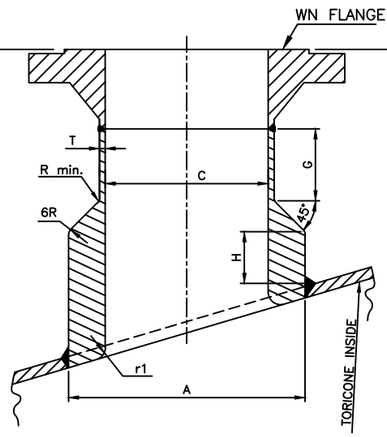

FIG.–3

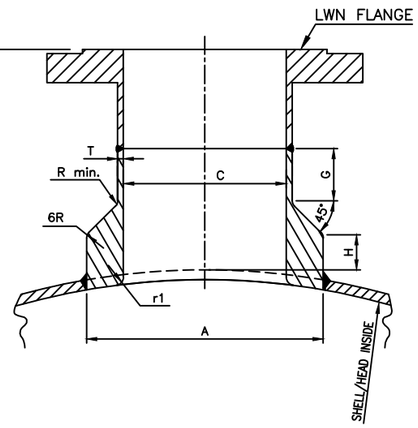

FIG.–4

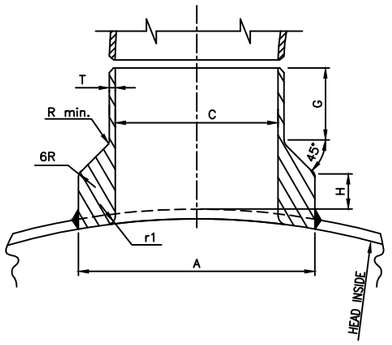

FIG.–5

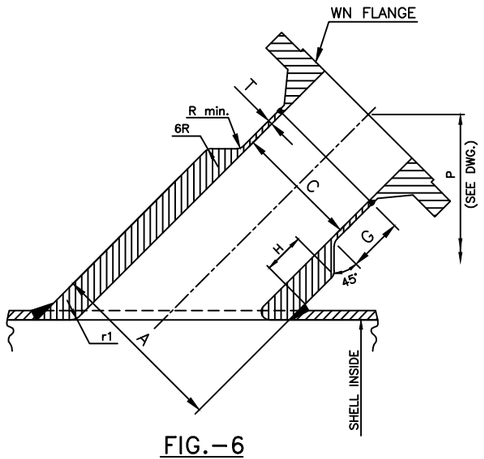

FIG.–6

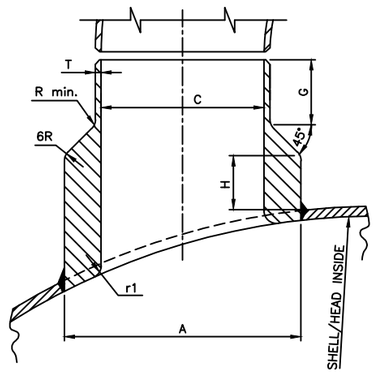

FIG.–7

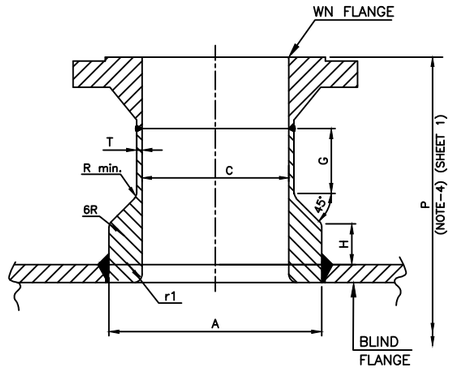

FIG.–1a

NOZZLE MARK	SIZE (NB)	P (MM) (NOTE–1)	A (MM)	C (MM)	H (MM) (MIN.)	T (MM)	G (MM)(MIN.) NOTE–(1)	FIG.
1	1450	1900	2071	1431	100	25	50	1
2	1450	3020	2131	1431	100	25	50	1
5	200	SEE SHT.2	393.68	193.68	100	SCH. 80	50	6
7/11	1050	2880	1545	1025	120	25	50	1
50	100	1650	192.05	92.05	75	SCH.120	50	5
HOLD 40A–C	76.2 I.D.	2500	156.2	76.2	75	20.4	50	4
35	50	2460	130.8	50.8	50	16.67	50	4
8	100	SEE SHT.2	235	92.05	70	SCH.120	50	1a

DETAIL OF SELF REINFORCED WELD NECK NOZZLE

NOTE:–

1. PROJECTION 'P' SHALL BE MAINTAINED. 'G' VALUE FURNISHED ARE MINIMUM AND SHALL BE SUITABLY INCREASE TO MAINTAIN PROJECTION 'P'.
2. RADIUS 'R min','r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE.

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DRAWING NO. B957–300–80–42–DS–3201 REV. B

SHEET 3 OF 3

1–1641–0503 REV.0 A3–420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेशन	PAD W x T पैड	SERVICE सर्विस
1 A-B	2	600	#	300	SRWN	RF	#	-	MANHOLE + BF + DAVIT
5	1	200	#	300	SRWN	RF	SEE SHT.2	-	DUMP NOZZLE
8	1	50.8 I.D.	#	600	SRLW N	RF	SEE SHT.3	-	VENT
11	1	350	#	300	SRWN	RF	#	-	FEED FROM 300-EE-4102/300-LZ-00-3002
17	1	500	#	300	SRWN	RF	SEE SHT.2	-	LIQUID BOTTOM OUTLET TO 300-CC-4101/300-PA-CF-4101A/B/C/D
21	1	150	#	300	SRWN	RF	#	-	VAPOR DRAWOFF TO 300-CC-00-4101
31	1	80	160	600	WN	RF	SEE SHT.2	-	DRAIN
35	1	50.8 I.D.	-	600	SRLW N	RF	SEE SHT.3	-	UTILITY CONNECTION
38 A-B	2	50.8 I.D.(H)	-	300	SRLW N	RF	SEE SHT.3	-	PRESSURE DIFFERENTIAL INDICATOR
40 A~C	3	76.2 I.D.(H)	#	300	SRLW N	RF	#	-	TEMPERATURE INDICATOR
LT 1-2	2	50.8 I.D.(H)	-	300	SRLW N	RF	#	-	LEVEL TRANSMITTER
SP 1-2	2	50.8 I.D.(H)	-	300	SRLW N	RF	#	-	STAND PIPE
50	1	80	#	300	SRWN	RF	#	-	CLEANOUT + B.F.
AO	1	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉऊडशन लोडिगं डाटा (आपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	241000	16000
SEISMIC		
WIND	66000	6000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125-250 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 900 APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14 FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
15 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
16 EQUIPMENT MAY BE ERECTED IN DRESSED UP CONDITON (I.E AFTER INSTALLATION OF INSULATION) BY OTHERS.CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES OF ACTUAL ERECTION WEIGHT.
17 COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
18 COMPLETE TOP & BOTTOM GRIDS & SCREEN INCLUDING NUT, BOLT, GASKET AND ITS SUPPORTING ARRANGEMENT TO BE DESIGNED AND SUPPLIED BY EQUIPMENT VENDOR.
19 OPERATING/ DESIGN CONDITION:

	OPERATING TEMPERATURE °C (SOR/EOR)	OPERATING PRESSURE KG/CM²G	DESIGN TEMP. °C	DESIGN PRESSURE KG/CM2G
HYDROGENATION	TOP: 39/42 BOTTOM: 58/59	TOP: 24.7 BOTTOM: 24.2	-45/80	39
REGENATION OXIDATION	460-480	1	500	3.5
REGENTATION HEATING GAS			250	7.5
REGENTATION HEATING STEAM			150	F.V

20 EQUIPMENT SHALL BE SUBJECTED TO DRY-OUT AT 80°C AND 7.0KG/CM²G.
21 WELD QUALITY FOR SKIRT-SHELL/HEAD JUNCTION: NDT SHALL BE CARRIED OUT AS PER TABLE 5.12 (FATIGUE STRENGTH REDUCTION FACTOR OF 1.5, QUALITY LEVEL 3) OF ASME SEC VIII DIV-1.
22 IT SHALL BE ENSURED BY VENDOR THAT FOR NOZZLE ABOVE 600 NB NOZZLE PIPE O.D. SHALL MATCH WITH CORRESPONDING STANDARD FLANGE O.D
23 ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-) 45°C WITH MIN ENERGY VALUES AS PER FIG. UG 84.1 OF ASME SEV VIII DIV.1
24 ALL THE INTERNAL & ITS SUPPORTS (EXCEPT CATALYST & INERT BALLS) SHALL BE DESIGNED AND SUPPLIED BY VENDOR.
25 WIRE MESH SHALL BE PROVIDED.
26 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING 1.25 TIMES OF EQUIPMENT ERECTION WEIGHT AND AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
X	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS(FOR GUIDANCE)	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
X	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010.
X	PROCESS DATASHEET	300-RB-00-4101A/B

HOLD UPS (होल्ड अप्स)

X	NOZZLE ELEVATIONS (AS MARKED)	X	SIZES OF NOZZLES (AS MARKED)
X	SUPPORT HEIGHT		PIPE SUPPORT CLEATS
	DETAILS OF INTERNALS		LADDER/PLATFORM CLEATS
X	NOZZLE ORIENTATION		TRAY SUPPORT/BOLTING BARS
X	INSULATION THICKNESS	X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE			ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE	(kg/cm²g)		NOTE-19
DESIGN PRESSURE	(kg/cm²g)	INT.	NOTE-19 EXT. (NOTE-19)
WORKING TEMPERATURE	(°C)		NOTE-19
DESIGN TEMPERATURE	(°C)		NOTE-19
MDMT	(°C)		(-) 45
CORROSION ALLLOWANCE	(MM)		3
TYPE OF HEAD			2:1 ELLIPSOIDAL
JOINT EFFICIENCY		SHELL 1	HEAD 1
RADIOGRAPHY		SHELL FULL	HEAD FULL
POST WELD HEAT TREATMENT			YES (NOTE-20)
HEAT TREATMENT			AS PER CODE/SPEC.
OPERATING MEDIUM			-
SP. GRAVITY			0.479 (TOP) / 0.439 (BOTTOM)
WIND SPECIFICATION			IS 875 (PART-3)
SEISMIC			IS 1893 + SITE SPECTRA (PART-4)
CAPACITY	(M^3)		74.2
PAINTING/CLEANING			AS PER SPEC.
INSULATION THICKNESS	(mm) (IH)		175 (HOLD) [X] HOT [ ] COLD
FIRE PROOFING CLEATS			[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)		HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)			50.7
INSPECTION BY			[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/BOOT	SA 516 GR.60*
REINFORCEMENT PAD/INSERT PLATE	-
HEADS	SA 516 GR.60*
SHELL FLANGES/SR/LWN	SA 350 LF2 CL1
NOZZLE FLANGES	SA 350 LF2 CL1
NOZZLE NECK UPTO 250 NB	SA 333 Gr.6
NOZZLE NECK ABOVE 250 NB	SA 516 GR.60*
PIPE FITTINGS	SA 420 GR. WPL6
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDIN GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 320 GR. L7 / SA 194 GR.7
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ SUPPORT	SA 516 GR.60*
SKIRT/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR
INTERNAL PARTS (WELDED)	SA 516 GR.60* / SA 333 Gr.6
INTERNAL PARTS (BOLTED)	SS 304$ C
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60* / IS 2062 GR. E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.60*
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	-
SCREEN	SS 304
LIFTING LUG	SA 516 GR.60*
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

$ SS 304L CAN ALSO BE USED C

* MATERIAL SHALL BE IMPACT TESTED AS PER SPEC./CODE REQUIREMENT.

`@ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP, AND OPERATIING LIQUID.

NO PLATFORM, LADDER, PIPING SHALL BE SUPPORTED ON THIS EQUIPMENT

SPECIAL SERVICE : --

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एप्रौक्सिमेंट वजन)(HOLD)

ERECTION	65500	OPERATING	130500
HYDROTEST(SHOP)	140000	HYDROTEST (FIELD)	181700

NUMBER OF ITEMS : TWO

REV	DATE	REVISION	BY	CHECKED	APPROVED
C	03.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB
B	27.08.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB
A	09.06.2025	REVISED AS MARKED	ROHIT	AD/VIVEK	PB

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER डाईग नम्बर	REV
MAPD CONVERTER	एमएपीडी कनवर्टर	B957-300-80-42-DS-3203	C
ITEM NO. 300-RB-00-4101A/B	आइटम नम्बर 300-आरबी-4101ए/बी	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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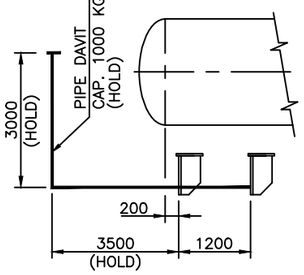
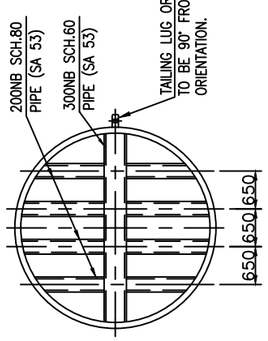
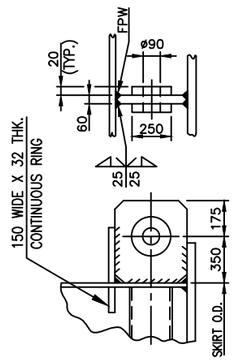


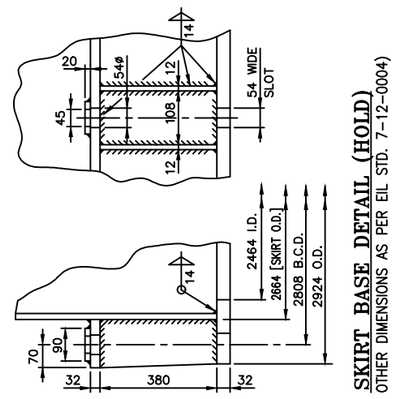
PIPE DAVIT
(AS PER EIL STD.)
(DAVIT TO BE LOOSE SUPPLIED ALONG WITH BRACKETS)



STIFFENING DETAIL OF SKIRT

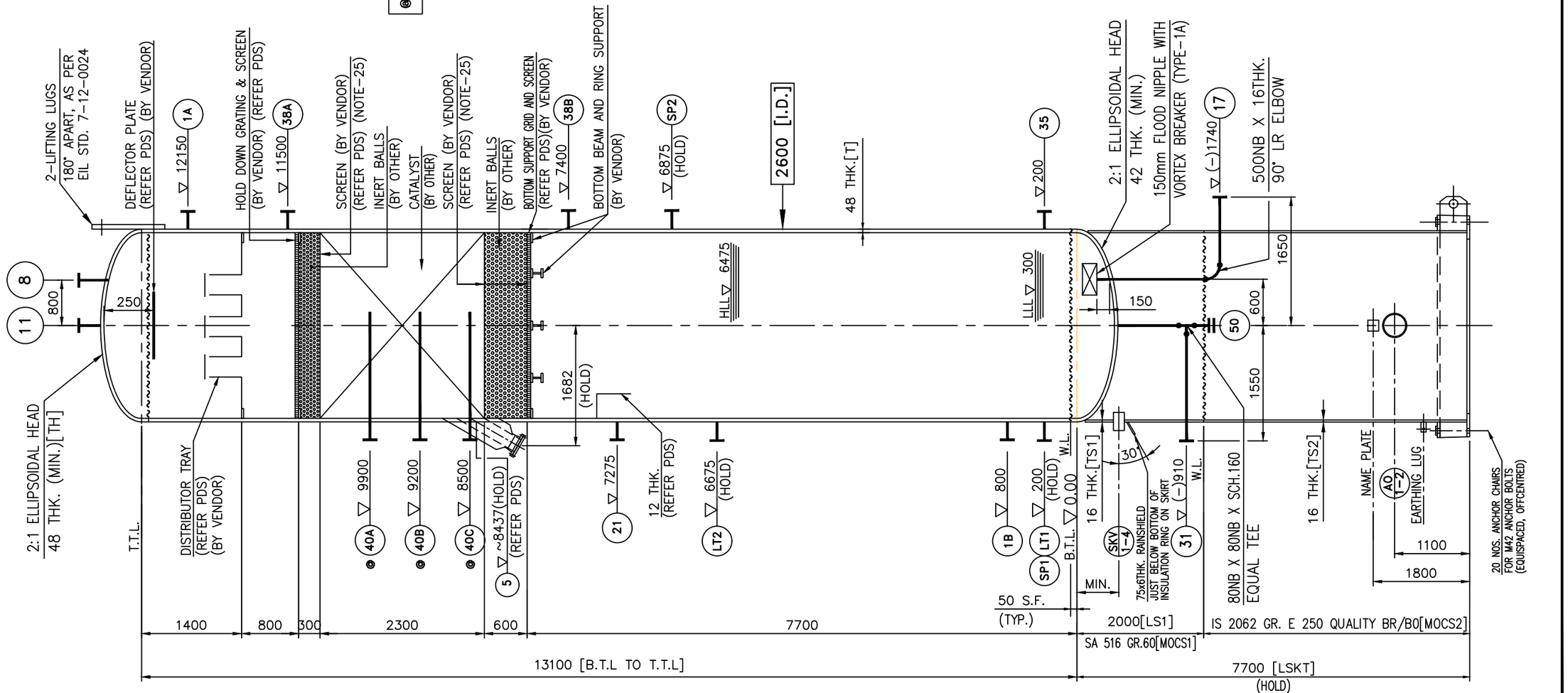


DETAIL OF TAILING LUG
VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.



SKIRT BASE DETAIL (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0004)

@ 120° TO EACH OTHER



C	03.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB		
B	27.08.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB		
A	09.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB		
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

VESSEL DESIGN DATA | वेसल डिजाइन डाटा
MAPD CONVERTER | एमएपीडी कनवर्टर
ITEM NO. 300-RB-00-4101A/B | आइटम नम्बर 300-आरबी-00-4101ए/बी

DRAWING NO. B957-300-80-42-DS-3203 | REV. C

SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

120

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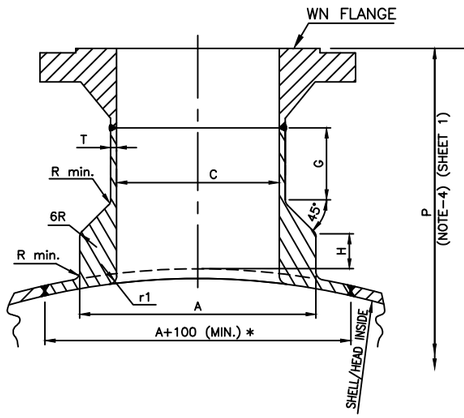

FIG.–1

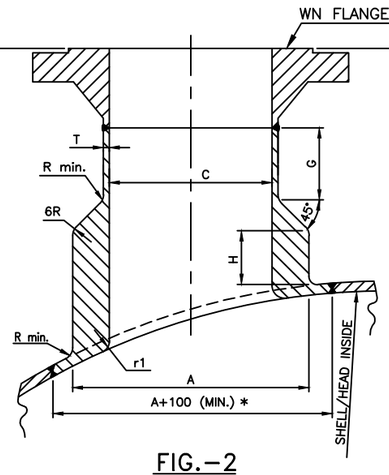

FIG.–2

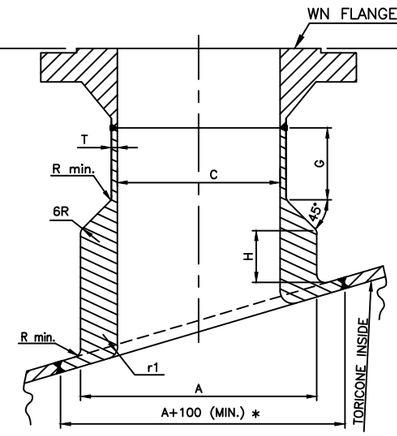

FIG.–3

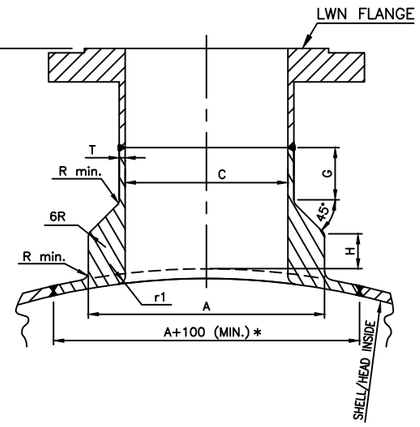

FIG.–4

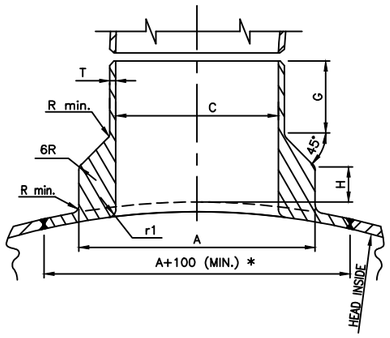

FIG.–5

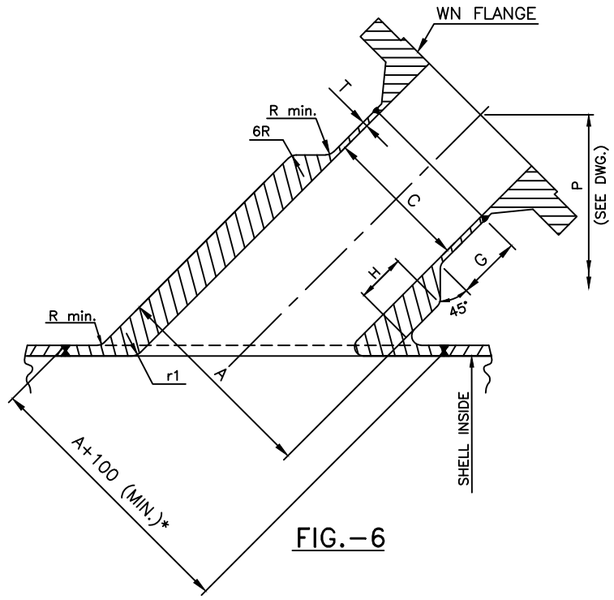

FIG.–6

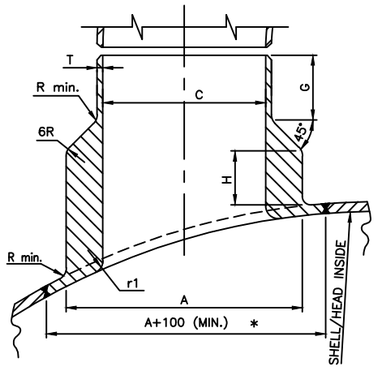

FIG.–7

	NOZZLE MARK	SIZE (NB) (NOTE–1,2)	P (MM)	A (MM)	C (MM)	H (MM)	T (MM)	G (MM) (MIN.) (NOTE–3)	FIG.
	1A/B	600	1770	862	582	75	14	50	1
	5	200	SEE SHT. 2	333.67	193.67	100	SCH. 80	50	6
	8	50	1210	130.8	50.8	50	16.76	50	2
	11	350	1210	463.6	323.6	90	16	50	1
	17	500	SEE SHT. 2	736	476	100	16	50	7
	21	150	1615	246.33	146.33	75	SCH. 60	50	1
	35	50.8	1560	130.8	50.8	50	16.67	50	1
	50	80	SEE SHT. 2	126.65	66.65	50	SCH. 160	50	1
	40A~C	76.2 I.D.	1560	157.2	76.2	50	20.4	50	4
HOLD	LT1–2,SP1–2,38A–B	50	1560	130.8	50.8	50	16.76	50	1

DETAIL OF SELF REINFORCED WELD NECK NOZZLE

NOTE:–

1. ALL NOZZLE TO SHELL JOINTS ARE TO BE FULLY RADIOGRAPHED EXCEPT FOR 80 NB NOZZLES.
2. NOZZLE OF SIZE 80 NB ARE SRWN WITHOUT LIP.
3. PROJECTION 'P' SHALL BE MAINTAINED. 'G' VALUE FURNISHED ARE MINIMUM AND SHALL BE SUITABLY INCREASE TO MAINTAIN PROJECTION 'P'.
4. RADIUS 'R min','r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE.

* REQUIREMENTS OF ASME SEC VIII DIV–1 FIG UW–16.1f(4) SHALL BE FOLLOWED.
VENDOR TO INCREASE THE LIP DIMENSION IF REQUIRED.

ENGINEERS INDIA LIMITED
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VESSEL DESIGN DATA
MAPD CONVERTER
ITEM NO. 300-RB-00-4101A/B

वेसल डिजाइन डाटा
एमएपीडी कनवर्टर
आइटम नम्बर 300-आरबी-00-4101ए/बी

DRAWING NO. B957–300–80–42–DS–3203 | REV. C
SHEET 3 OF 3

1–1641–0503 REV.0 A3–420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेक्शन	पैड	सॉवेस
1	1	600	#	300	SRWN	RF	#	-	MANHOLE + BF + DAVIT
2A	1	1050 (H)	#	300	SRWN	RF	SHEET-2	-	MANHOLE + BF +LIFTING LUG (NOTE-19)
2B	1	1050 (H)	#	300	SRWN	RF	#	-	MANHOLE + BF +DAVIT (NOTE-28)
5 A-B	2	200	#	300	SRWN	RF	#	-	DUMP NOZZLE
7	1	600	#	300	SRWN	RF	#	-	VAPOR OUTLET TO 300-GN-00-2002A/B
8	1	80	#	600	SRWN	RF	#	-	VENT
11	1	600	#	300	SRWN	RF	#	-	FEED FROM 300-VV-VI-2006
31	1	100	120	300	WN	RF	SEE SHT.-2	-	DRAIN
35	1	50.8 ID.	#	600	SRLWN	RF	#	-	UTILITY CONNECTION
SP2	1	50.8 ID.(H)	-	300	SRLWN	RF	#	-	STAND PIPE
SP1	1	50 (H)	160	300	WN	RF	SEE SHT.-2	-	STAND PIPE
49	1	80 (H)	#	600 (H)	SWRN	RF	#	-	MOISTURE PROBE NOZZLE +FILLER FLANGE
50	1	100	#	300	SRWN	RF	#	-	CLEANOUT + BF
SKV 1-4	4	100	40	AS PER STANDARD					SKIRT VENT
AO 1-2	2	500 I.D.	14 THK.	AS PER STANDARD					ACCESS OPENING

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

'#' REFER SHEET 3

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉऊंडेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	517000	49000
WIND	52000	6600

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125-250 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 900 APART.
10 ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, APPLICATION OF SHOP PRIMER & FINISH PAINT SHALL BE CARRIED OUT AT SHOP BY EQUIPMENT VENDOR AS PER PAINTING SPEC.
13 FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
14 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
15 COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
16 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
17 OPERATING AND DESIGN CONDITIONS :

	OPERATING		DESIGN	
	TEMP. ^{0}C	PRESSURE Kg/cm^{2}g	TEMP. ^{0}C	PRESSURE Kg/cm^{2}g
NORMAL OPERATION	11.8	25.01	(-)29/65	31.5
REGENERATION	232.2	4.33	250	7.5

18 EQUIPMENT SHALL BE SUBJECT TO DRY OUT AT 7.0 Kg/cm2(g) @80°C.
19 VENDOR SHALL DESIGN & SUPPLY 4 NOS. LIFTING LUG FOR COMPLETE ASSEMBLY OF NOZZLE '2A'.
20 ALL THE INTERNAL & ITS SUPPORTS (EXCEPT CATALYST & INERT BALLS) SHALL BE DESIGNED AND SUPPLIED BY VENDOR.
21 ALL REMOVBALE INTERNALS SHALL BE SIZED TO PASS THROUGH NEAREST MANHOLE.
22 COMPLETE TOP & BOTTOM GRIDS & SCREENS INCLUDING NUT, BOLT, GASKET & ITS SUPPORTING ARRANGEMENT TO BE DESIGNED & SUPPLIED BY EQUIPMENT VENDOR.
23 WIRE MESH SHALL BE PROVIDED.
24 WELD QUALITY FOR SKIRT-SHELL/HEAD JUNCTION : NDT SHALL BE CARRIED OUT AS PER TABLE 5.12 (FATIGUE STRENGTH REDUCTION FACTOR OF 1.5, QUALITY LEVEL OF 3.0) OF ASME SEC VIII DIV.2.
25 ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-)29ºC WITH MIN. ENERGY VALUE AS PER FIG. UG84.1 OF ASME SEC. VIII DIV.1.
26 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING 1.25 TIMES OF EQUIPMENT ERECTION WEIGHT AND AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
27 EQUIPMENT MAY BE ERECTED IN DRESSED UP CONDITION (BY OTHERS). LIFTING TRUNNION SHALL BE DESIGNED BY VENDOR. MECHANICAL DESIGN OF LIFTING TRUNNION SHALL BE CARRIED OUT CONSIDERING 1.25 TIMES OF EQUIPMENT WEIGHT AND AN IMPACT FACTOR OF 1.5. THE INDUCED STRESS IN SHELL & TRUNNION SHALL BE WITHIN 90% OF YIELD. VENDOR TO PROVIDE INSERT PLATE OF SUITABLE SIZE AND THICKNESS WHEREVER REQUIRED BY ANALYSIS. VENDOR SHALL ENSURE THAT ERECTION / RIGGING SLINGS SHALL NOT FOUL WITH ANY EXTERNAL ATTACHMENTS i.e. NOZZLES, NOZZLE FLANGES, PIPING / PLATFORM / INSULATION CLIPS, PIPE DAVIT BRACKETS, VACUUM STIFFENERS, SHELL GIRTH FLANGE ETC. AND ACCORDINGLY, PROJECTION & ORIENTATION OF TRUNNIONS SHALL BE FIRMED-UP.
28 VENDOR SHALL DESIGN & SUPPPLY THE DAVIT FOR THE MANHOLE COVER OF NOZZLE 2B. WITH IMPACT FACTOR OF 2.0

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-SP-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
X	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS (FOR GUIDANCE)	7-12-0022
X	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
X	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
X	PROCESS DATASHEET	300-VD-00-2001A/B/C
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	INSULATION THK./TYPE	X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^{2}g)	NOTE-17
DESIGN PRESSURE	(kg/cm^{2}g)	INT. NOTE-17 EXT. -
WORKING TEMPERATURE	(°C)	NOTE-17
DESIGN TEMPERATURE	(°C)	NOTE-17
MDMT	(°C)	(-)29
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPSOIDAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		YES (NOTE-15)
HEAT TREATMENT		AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		-
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	234.4
PAINTING/CLEANING		AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)		80 (HOLD) [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		40.95
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)
(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/~~BOOT~~	SA 516 GR.70*
REINFORCEMENT PAD/INSERT PLATE	-
HEADS	SA 516 GR.70*
~~SHELL FLANGES~~/SR/LWN	SA 350 LF2 CL1
NOZZLE FLANGES	SA 350 LF2 CL1
NOZZLE NECK UPTO 250 NB	SA 333 GR.6
NOZZLE NECK ABOVE 250 NB	SA 516 GR.70*
PIPE FITTINGS	SA 420 GR. WPL 6
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7/SA 194 GR.7
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ ~~SUPPORT~~	SA 516 GR.70* / IS 2062 GR. E 250 QUALITY
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR
INTERNAL PARTS (WELDED)	SA 516 GR.70*/ SA 333 GR.6
INTERNAL PARTS (BOLTED)	SS 304$ B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70* / IS 2062 GR. E 250 QUALITY BR WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70*
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	-
LIFTING TRUNNION	SA 516 GR.70 *
TAILING LUG	IS 2062 GR. E 250 QUALITY BR
SCREEN	SS 304
$ SS 304L CAN ALSO BE USED B	

*** MATERIAL SHALL BE IMPACT TESTED AS PER CODE/SPEC. REQUIREMENT.**

@ INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

NO PLATFORM/LADDER/PIPING SHALL BE SUPPORTED IN THIS EQUIPMENT

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)
DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एप्रौक्सिमेंट वजन)(HOLD)

ERECTION	158000	OPERATING	325000
HYDROTEST(SHOP)	393000	HYDROTEST (FIELD)	432000
NUMBER OF ITEMS :	THREE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

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DESIGN DATA	डिजाइन डाटा
CHARGE GAS DRYERS	चार्ज गैस ड्रायर
ITEM NO. 300-VD-00-2001 A/B/C	आइटम नम्बर 300-वीडी-00-2001ए/बी/सी

DRAWING NUMBER डाईग नम्बर	REV
B957-300-80-42-DS-3301	B
SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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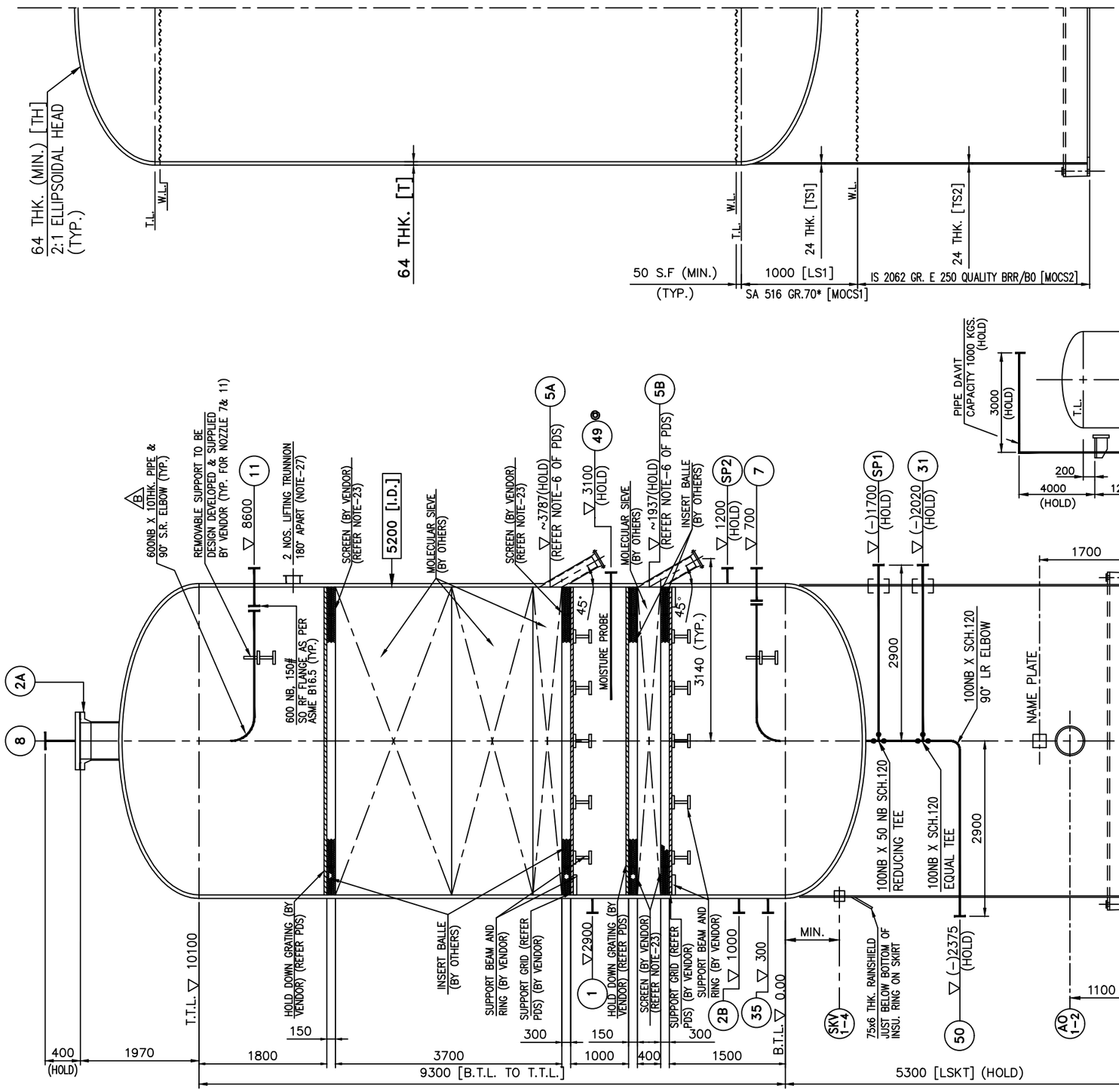
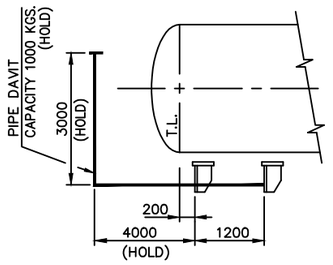
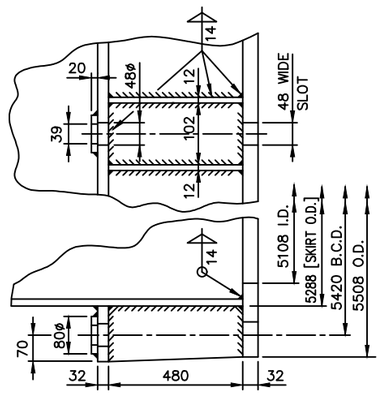


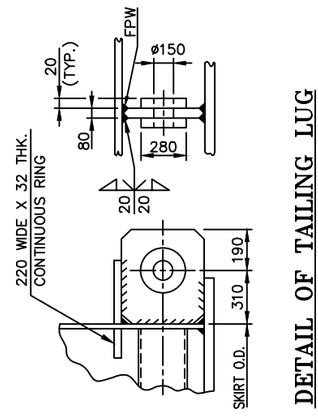


PIPE DAVIT (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0023)
(DAVIT TO BE LOOSE SUPPLIED ALONG WITH BRACKETS)

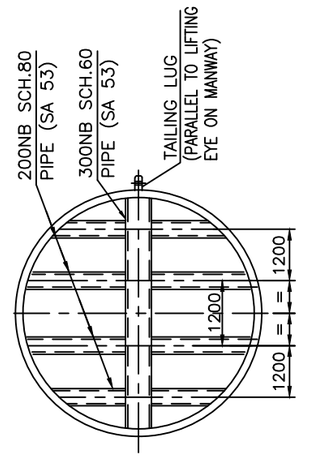


SKIRT BASE DETAIL (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0004)

(@) - WITH MOISTURE PROBE AS PER PDS (BY VENDOR)



DETAIL OF TAILING LUG
(*) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.



STIFFENING DETAIL OF SKIRT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

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B	02.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	AD/VIVEK	PB	
A	05.06.2025	ISSUED FOR BIDS/ENGG.	AS	AD/VIVEK	PB	

VESSEL DESIGN DATA
CHARGE GAS DRYERS
ITEM NO. 300-VD-00-2001 A/B/C

वेसल डिजाइन डाटा
चार्ज गैस ड्रायर
आइटम नम्बर 300-वीडी-00-2001ए/बी/सी

DRAWING NO.	REV.
B957-300-80-42-DS-3301	B
SHEET 2 OF3	

1-1641-0503 REV.0 A3-420x297

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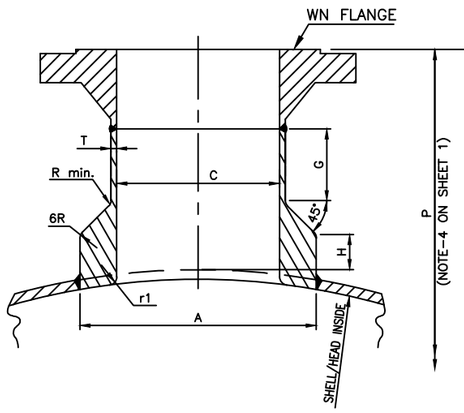

FIG.–1

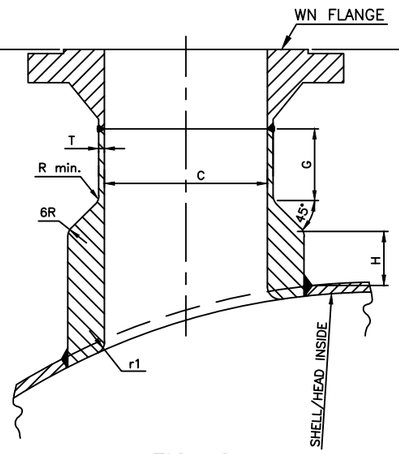

FIG.–2

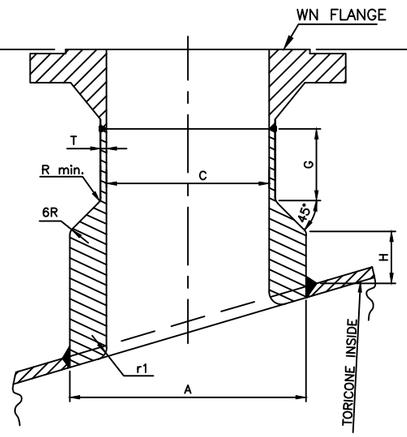

FIG.–3

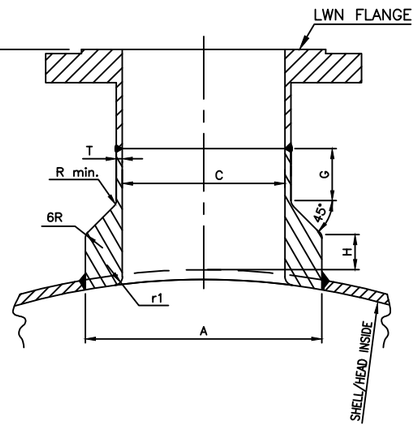

FIG.–4

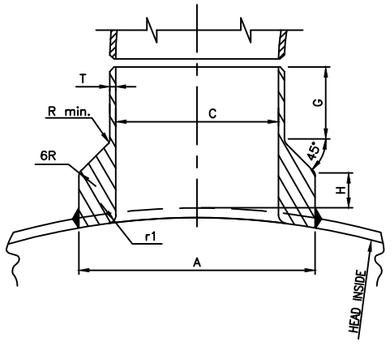

FIG.–5

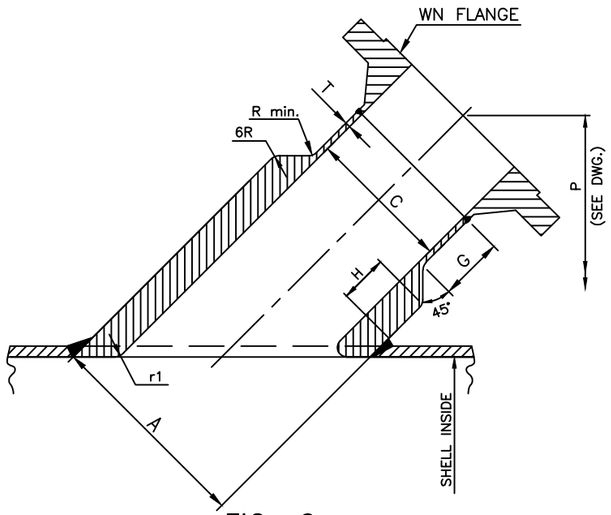

FIG.–6

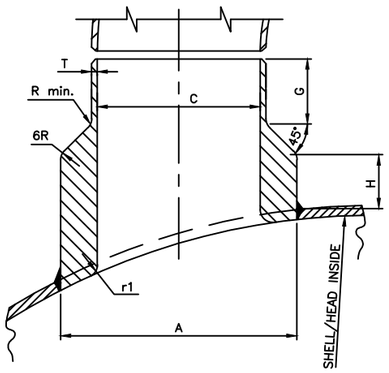

FIG.–7

NOZZLE MARK	SIZE (NB)	P (MM)	A (MM)	C (MM)	H (MM)	T (MM)	G (MM) (MIN.) (NOTE–1)	FIG.
	1	600	3040	882	582	80	20	50	1
HOLD	2A	1050	SHEET–2	1455	1035	150	20	50	1
HOLD	2B	1050	3230	1535	1035	80	20	50	1
	5 A–B	200	SHEET–2	373.67	193.67	120	80	50	6
	7 & 11	600	3140	870	570	120	20	50	1
	8	80	SHEET–2	146.65	66.65	80	160	50	1
	35	50	2900	130.8	50.8	80	16.76	50	4
	50	100	SHEET–2	192.05	92.05	80	120	50	5
HOLD	49	80	2850	166.650	66.650	80	160	50	1
HOLD	SP2(HOLD)	50	2900	130.8	50.8	80	16.76	50	4

DETAIL OF SELF REINFORCED WELD NECK NOZZLE

NOTE:–

1. PROJECTION 'P' SHALL BE MAINTAINED. 'G' VALUE FURNISHED ARE MINIMUM AND SHALL BE SUITABLY INCREASE TO MAINTAIN PROJECTION 'P'.
2. RADIUS 'R min','r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE.

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VESSEL DESIGN DATA
CHARGE GAS DRYERS
ITEM NO. 300-VD-00-2001 A/B/C

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चार्ज गैस ड्रायर
आइटम नम्बर 300-वीडी-00-2001ए/बी/सी

DRAWING NO. B957–300–80–42–DS–3301
REV. B
SHEET 3 OF 3

1–1641–0503 REV.0 A3–420x297

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NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
1	1	1300 (H)	#	300	SRWN	RF	#	-	MANHOLE + BF +LIFTING HOOK
2	1	1300 (H)	#	300	SRWN	RF	#	-	MANHOLE + B.F. + DAVIT
5	1	200	#	300	SRWN	RF	#	-	DUMP NOZZLE
7	1	1000	#	300	SRWN	RF	#	-	VAPOR OUTLET TO 300-GN-00-2201A/B
8	1	50.8 ID.	-	600	LWN	RF	SEE SHT. 3	-	VENT
11	1	1000	#	300	SRWN	RF	#	-	FEED FROM 300-EE-00-2211
31	1	80	160	600	WN	RF	SEE SHT. 3	-	DRAIN
35	1	50.8 ID.	-	300	LWN	RF	3230	-	UTILITY CONNECTION
50	1	80	#	600	SRWN	RF	#	-	DRAIN
SKV 1-6	6	100	40	AS PER STANDARD					SKIRT VENT
AO 1-2	2	500 I.D.	14 THK.	AS PER STANDARD					ACCESS OPENING

'#' REFER SHEET-3

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
B फॉऊडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	578000	54000
	-	-
WIND	163000	14100

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125-250 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10. ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, PRIMER & FINISH PAINT SHALL BE CARRIED OUT AT YARD BY EQUIPMENT VENDOR AS PER PAINTING SPEC.
13. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14. FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
15. ALL PLATES AND WELDS INCLUDING HAZ SHALL BE IMPACT TESTED AT (-)29ºC WITH MIN. ENERGY VALUE AS PER FIG. UG84.1 OF ASME SEC. VIII DIV.1.
16. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
17. LIFTING TRUNNION SHALL BE DESIGNED BY VENDOR. MECHANICAL DESIGN OF LIFTING TRUNNION SHALL BE CARRIED OUT CONSIDERING ACTUAL EQUIPMENT WEIGHT AND AN IMPACT FACTOR OF 1.5. THE INDUCED STRESS IN SHELL & TRUNNION SHALL BE WITHIN 90% OF YIELD. VENDOR TO PROVIDE INSERT PLATE OF SUITABLE SIZE AND THICKNESS WHEREVER REQUIRED BY ANALYSIS. VENDOR SHALL ENSURE THAT ERECTION / RIGGING SLINGS SHALL NOT FOUL WITH ANY EXTERNAL ATTACHMENTS i.e. NOZZLES, NOZZLE FLANGES, PIPING / PLATFORM / INSULATION CLIPS, PIPE DAVIT BRACKETS, VACUUM STIFFENERS, SHELL GIRTH FLANGE ETC. AND ACCORDINGLY PROJECTION & ORIENTATION OF TRUNNIONS SHALL BE FIRMED-UP.
18. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
19. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE FULLY RADIOGRAPHED.
20. EQUIPMENT SHALL BE COMPLETELY FABRICATED, HYDROTESTED IN SINGLE PIECE, PAINTED AT YARD. THEREAFTER IT SHALL BE TRANSPORTED TO ERECTION SITE IN SINGLE PIECE. ERECTION OF EQUIPMENT SHALL BE IN SINGLE PIECE.
21. OPERATING AND DESIGN CONDITIONS:

	OPERATING		DESIGN	
	TEMPERATURE	PRESSURE	TEMP.	PRESSURE
	^{0}C	Kg/cm^{2}g	^{0}C	Kg/cm^{2}g
NORMAL OPERATION	40	20.2	-29/65	31.5
REGENERATION	232	4.2	250	7.5

(B): EQUIPMENT SHALL BE DRY-OUT AT 80ºC AND 7.0 kg/cm2g.

22. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED INTERNAL SHALL BE 12mm & BOLTED SS INTERNAL SHALL BE 6mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
23. BOTTOM OF NOZZLE #5 TO BE FLUSH WITH BOTTOM OF MOLECULAR SIEVE BED AND ANGLED DOWNWARD AT 45º FROM THE VERTICAL. PROVIDE COVER/PLUG INSIDE NOZZLE FLUSH WITH VESSEL WALL. (TO BE DEVELOPED BY EQUIPMENT VENDOR.)
24. IT SHALL BE ENSURED BY VENDOR THAT FOR NOZZLE ABOVE 600 NB NOZZLE PIPE O.D. SHALL MATCH WITH CORRESPONDING STANDARD FLANGE O.D.
25. VENDOR TO PROVIDE 4 NOS. LIFTING HOOK EQUALLY SPACED ON BLIND FLANGE OF MANHOLE NOZZLE 1 FOR LIFTING.
26. **WELD QUALITY FOR SKIRT-SHELL/HEAD JUNCTION: NDT SHALL BE CARRIED OUT AS PER TABLE 5.12 (FATIGUE STRENGTH REDUCTION FACTOR OF 1.5, QUALITY LEVEL 3) OF ASME SEC VIII DIV-2**
27. WIRE MESH SCREEN SHALL BE PROVIDED.
28. DAVIT FOR MANHOLE (NOZZLE -2) SHALL BE DESIGNED & SUPPLIED BY VENDOR CONSIDERING IMPACT FACTOR OF 2.0
29. ALL INTERNALS (EXCEPT MOLEULAR SIEVE & INNERT BALLS) SHALL BE DESIGNED AND SUPPIED BY VENDOR.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	STD. SPEC. FOR SS PLATES	6-12-0020
X	STD. SPEC. FOR HARDNESS REQUIREMENT OF STATIC EQP.	6-15-0091
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
X	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS (FOR GUIDANCE)	7-12-0022
X	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	-
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	-
X PROCEES DATASHEET	300-VD-00-2201
X MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 ED. 2023
WORKING PRESSURE (kg/cm^{2}g)	NOTE-21
DESIGN PRESSURE (kg/cm^{2}g) (NOTE-21)	INT. NOTE-21 EXT. NOTE-21
WORKING TEMPERATURE (°C)	NOTE-21
DESIGN TEMPERATURE (°C)	NOTE-21
MDMT (°C)	(-)29
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-20)
HEAT TREATMENT	AS PER CODE/SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	-
WIND SPECIFICATION	IS 875 (PART-3)
SEISMIC	IS 1893 + SITE SPECTRA (PART-4)
CAPACITY (M^3)	263
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-12)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	40.95
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/~~BOOT~~	SA 516 GR.70*
REINFORCEMENT PAD/INSERT PLATE	-
HEADS	SA 516 GR.70*
~~SHELL FLANGES~~/SR/LWN	SA 350 GR.LF2 CL1
NOZZLE FLANGES	SA 350 GR.LF2 CL1
NOZZLE NECK UPTO 250 NB	SA 333 GR.6
NOZZLE NECK ABOVE 250 NB	SA 516 GR.70*
PIPE FITTINGS	SA 420 GR. WPL6
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS 304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ABESTOS FREE $
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 Gr.2H
INTERNAL STUDS/BOLTS/NUTS	SA 193 GR. B8 / SA 194 GR. 8
SKIRT/ ~~SUPPORT~~	SA 516 GR.70* /IS 2062 GR. E 250 QUALITY BR
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR
INTERNAL PARTS (WELDED)	SA 516 GR.70* / SA 333 GR.6 / SA 350 LF2 CL.1
INTERNAL PARTS (BOLTED)	SA 516 GR.70* / SA 333 GR.6 / SA 350 LF2 CL.1
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70*/ IS 2062 GR. E 250 QUALITY B WELDED OVER IMPACT TESTED BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70*
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	-
LIFTING TRUNION	SA 516 GR.70*
TAILING LUG	IS 2062 GR. E 250 QUALITY BR
SCREEN	SS 304

$ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

* MATERIAL SHALL BE IMPACT TESTED AS PER SPEC. / CODE REQUIREMENT.

$ ERECTION WEIGHT INDICATED IS EXCLUSIVE OF WEIGHT OF INTERNALS, PLATFORMS, INSULATION, PIPING SPOOL, ETC.

NO PIPING, LADDER / PLATFORM & PIPE DAVIT TO BE SUPPORTED ON THE EQUIPMENT

SITE FABRICATED EQUIPMENT

SPECIAL SERVICE : CYCLIC SERVICE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एप्रौक्सिमेंट वजन)(HOLD)

ERECTION	194000 $	OPERATING	323000
HYDROTEST(SHOP)	457000	HYDROTEST (FIELD)	580000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
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DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
ACETYLENE CONVERTER DRYER	एसीटीलीन कन्वर्टर डायर	B957-300-80-42-DS-3303	0
ITEM NO. 300-VD-00-2201	आइटम नम्बर 300-वीडी-00-2201	SHEET 1 OF 3	

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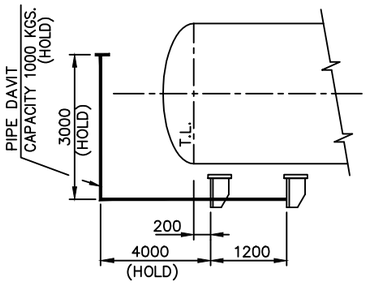
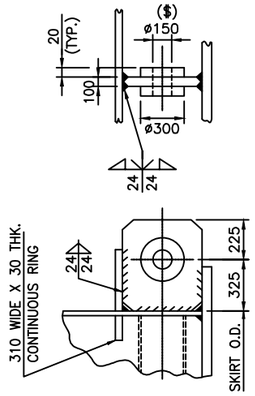
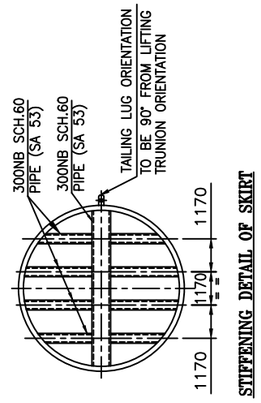


PIPE DAVIT
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0023)
(DAVIT TO BE LOOSE SUPPLIED ALONG WITH BRACKETS)

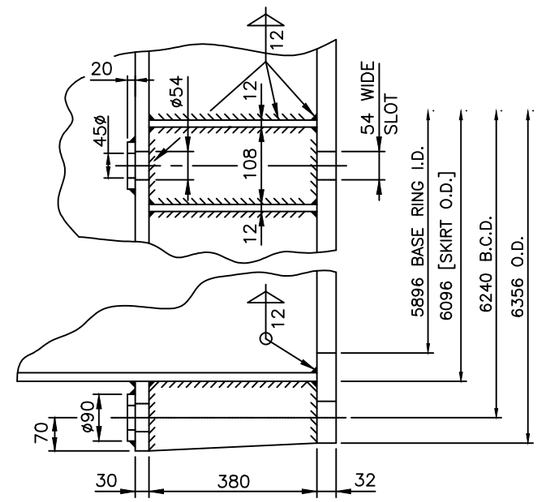


TAILING LUG DETAIL

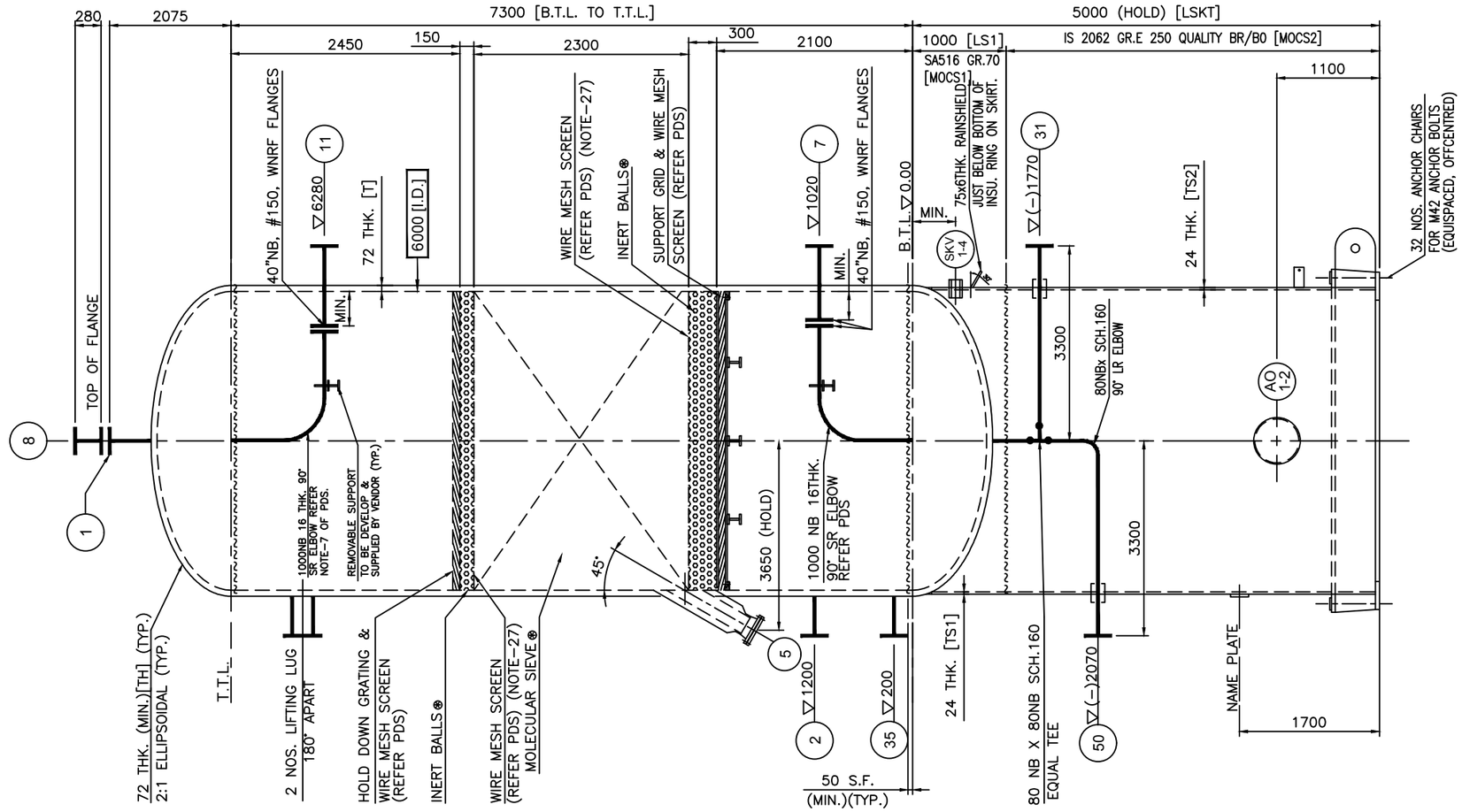
($) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.



STIFFENING DETAIL OF SKIRT



SKIRT BASE DETAIL (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



® BY OTHERS, ALL OTHER INTERNALS BY VENDOR.

0	02.12.2025	ISSUED FOR PURCHASE	AS	AD/VIVEK	PB	
B	05.06.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	AD/VIVEK	PB	
A	16.04.2025	ISSUED FOR BIDS/ENGG.	AS	AD/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

VESSEL DESIGN DATA
ACETYLENE
CONVERTER DRYER
ITEM NO. 300-VD-00-2201

वेसल डिजाइन डाटा
एसीटीलीन
कन्वर्टर डायर
आइटम नम्बर 300-वीडी-00-2201

DRAWING NO. B957-300-80-42-DS-3303 | REV. 0

SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

120

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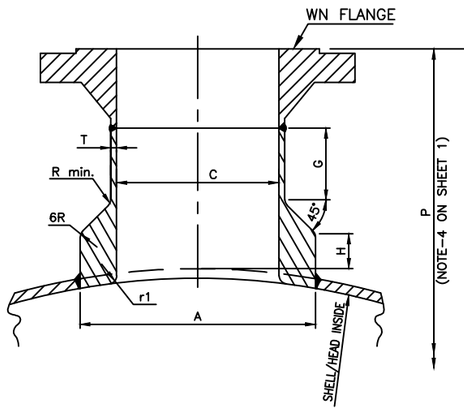

FIG.–1

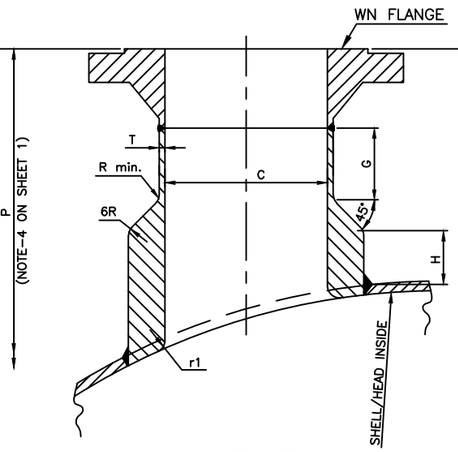

FIG.–2

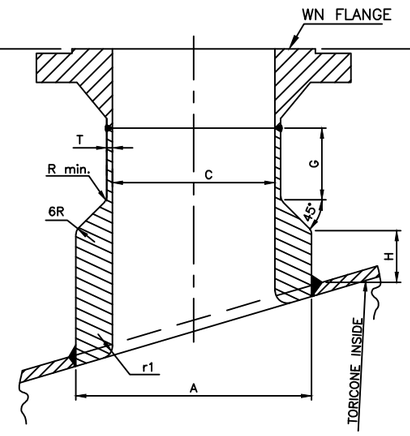

FIG.–3

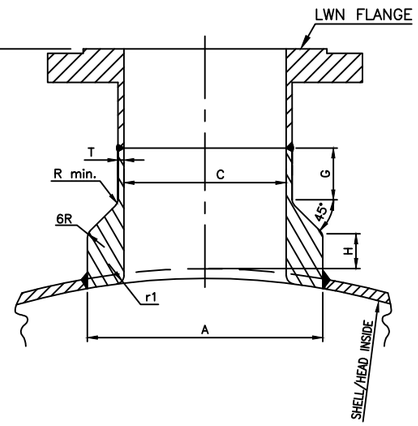

FIG.–4

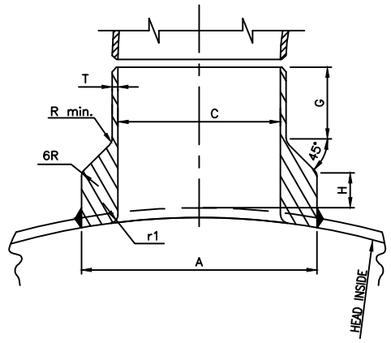

FIG.–5

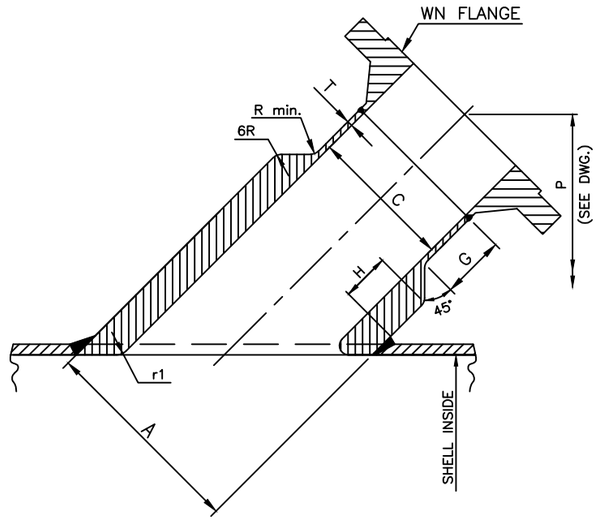

FIG.–6

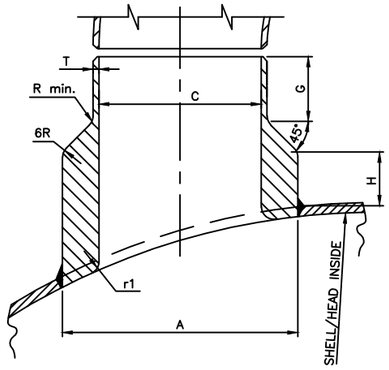

FIG.–7

	NOZZLE MARK	SIZE (NB) (NOTE–1,2)	P (MM)	A (MM)	C (MM)	H (MM)	T (MM)	G (MM) (MIN.) (NOTE–1)	FIG.
HOLD	1	1300	2400	1880.8	1280.8	140	20	50	1
HOLD	2	1300	3820	1888.7	1288.7	140	20	50	1
	5	200	SEE SHT.–2	353.65	193.65	150	SCH. 80	50	6
	7 & 11	1000	3675	1382	942	170	40	50	1
	50	80	SEE SHT.–2	146.65	66.65	75	SCH. 160	50	5

DETAIL OF SELF REINFORCED WELD NECK NOZZLE

NOTE:–

1. PROJECTION 'P' SHALL BE MAINTAINED. 'G' VALUE FURNISHED ARE MINIMUM AND SHALL BE SUITABLY INCREASE TO MAINTAIN PROJECTION 'P'.
2. RADIUS 'R min','r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE.

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
0	02.12.2025	ISSUED FOR PURCHASE	AS	AD/VIVEK	PB	
B	06.06.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	AD/VIVEK	PB	
A	16.04.2025	ISSUED FOR BIDS/ENGG.	AS	AD/VIVEK	PB	

VESSEL DESIGN DATA
ACETYLENE CONVERTER DRYER
ITEM NO. 300-VD-00-2201

वेसल डिज़ाइन डाटा
एसीटीलीन कन्वर्टर डायर
आइटम नम्बर 300-वीडी-00-2201

DRAWING NO. B957–300–80–42–DS–3303 | REV. 0

SHEET 3 OF 3

1–1641–0503 REV.0 A3–420x297

Fives Cryo 25 bis, rue du fort 88194 GOLBEY Cedex France TEL : +33.(0)3 29 68 00 00	**PERLITE TECHNICAL SPECIFICATION**	fives

Application:

Perlite for Cryogenic application used for cold-boxes insulation (using range located between +100°C to -200°C).
Here is the quality of perlite recommended by Fives Cryo in order to perform the insulation of cold-boxes.

Density:

Density for a compacted perlite used in cryogenic heat exchangers.
The density is between 50 and 65 Kg/m^3 function of the quality of the perlite.

Specification:

Regarding to the chemical analysis range for perlite in accordance with a cryogenic applications, see the here below table showing the up and down percentages relative to the weights of the components.

SiO_2	AL_2O_3+ Fe_2O_3	CaO + MgO	Na_2+ K_2O
71 à 79.5%	13 .3 à 18%	0.44 à 2%	2.5 à 9%

Particles' sizes:

Sieve's sizes in microns	Weights in percentages (%)	Tolerance
>800 microns	20	±10%
800 à 500 microns	20	±10%
500 à 250 microns	25	±10%
250 à 160 microns	15	±10%
160 à 63 microns	15	±10%
<63microns	5	±5%

Storage conditions:

It is recommended to buy perlite packed in bags or bulk only. They must be delivered on site in special tank trucks designed for this application.
The storage inside paper bags is not allowed because it does not meet the criteria for compliance with the required minimum humidity rate. The recommended humidity rate throughout the storage is 0.1% of the weight).

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NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
1	1	600	14 THK	300	WN	RF	1080	300X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
3	1	200	80	300	WN	RF	1930	110X T	VENTILATION NOZZLE
6	1	80 (H)	160	300	WN	RF	1930	45X T	VAPOR OUTLET TO WET FLARE
11	1	150	80	300	WN	RF	1930	85X T	FEED FROM 300-PA-CF-4202A/B,305-EE-00-5711
17	1	250	60	300	WN	RF	1730	135X T	LIQUID BOTTOM OUTLET TO 301-PA-CF-1601 A~C
20	1	100	120	300	WN	RF	1930	60X T	MIN. FLOW RETURN FROM 301-PA-CF-1601 A~C
31A	1	80	160	300	WN	RF	1730	45X T	DRAIN
31B	1	80	160	300	WN	RF	300	45X T	DRAIN
35	1	50	160	600	WN	RF	930	-	UTILITY CONNECTION
38	1	50	160	300	WN	RF	1930	-	PRESSURE TRANSMITTER
LG 1-2	2	50 (H)	160	300	WN	RF	320	-	LEVEL GUAGE (MAG)-INT
LG 3-4	2	50 (H)	160	300	WN	RF	930	-	LEVEL GUAGE (MAG)
LT 1-2	2	50 (H)	160	300	WN	RF	320	-	LEVEL TRANSMITTER (GWR)-INT
LT 3-10	8	50 (H)	160	300	WN	RF	930	-	LEVEL TRANSMITTER (DP)

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
SEISMIC (MC)	-	-
WIND	-	-

B957-301-79-41-DS-1201 REV.1

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
13. FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
14. EQUIPMENT SHALL BE SUBJECT TO STEAM OUT AT 0.5Kg/cm2(g) @190°C.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	-
LADDERS/PLATFORM CLEATS	-
PIPE SUPPORT CLEATS	-
TRAY SUPPORT AND BOLTING BARS	-
DEMISTER DATA SHEET	-
SKETCH FOR MONKEY LADDER	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	FIXED/SLIDING SUPPORT		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE	(kg/cm²g)	3.54
DESIGN PRESSURE	(kg/cm²g)	INT. 25 EXT. --
WORKING TEMPERATURE	(°C)	40
DESIGN TEMPERATURE	(°C)	65
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD / CONE 1
RADIOGRAPHY		SHELL FULL HEAD / CONE FULL
POST WELD HEAT TREATMENT		AS PER CODE / SPEC.
HEAT TREATMENT		AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		0.575
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	71
PAINTING/CLEANING		(NOTE-11)
INSULATION THICKNESS (mm) (IH)		NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS		☐ YES ☒ NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)		32.5
INSPECTION BY		☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.70
REINFORCEMENT PAD ~~/ INSERT PAD~~	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	SA 516 GR.70
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 Gr B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/IS 2062 GR.E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

SPECIAL SERVICE : -

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	34000	OPERATING	79000
HYDROTEST(SHOP)	105000	HYDROTEST (FIELD)	114000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	28.08.2025	ISSUED FOR BIDS / ENGG.	NS	SA/VIVEK	PB

DESIGN DATA
C4 FEED SURGE DRUM
ITEM NO. 301-VV-HW-1601

डिजाइन डाटा
सी4 फीड सर्ज ड्रम
आइटम नम्बर 301-वीवी-एचडब्लू-1601

DRAWING NUMBER / डाईग नम्बर: **B957-301-80-42-DS-3101** REV: A
SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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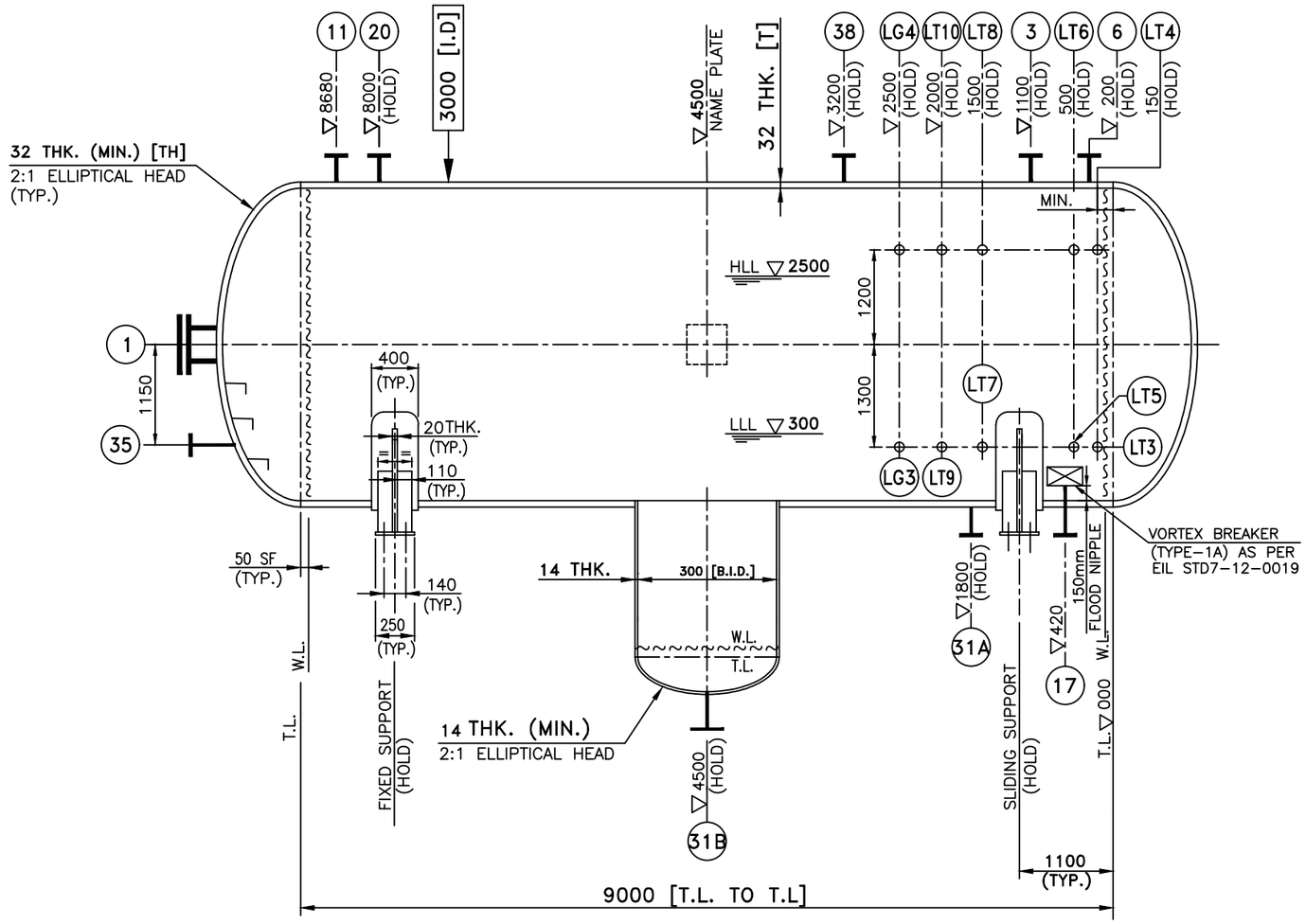
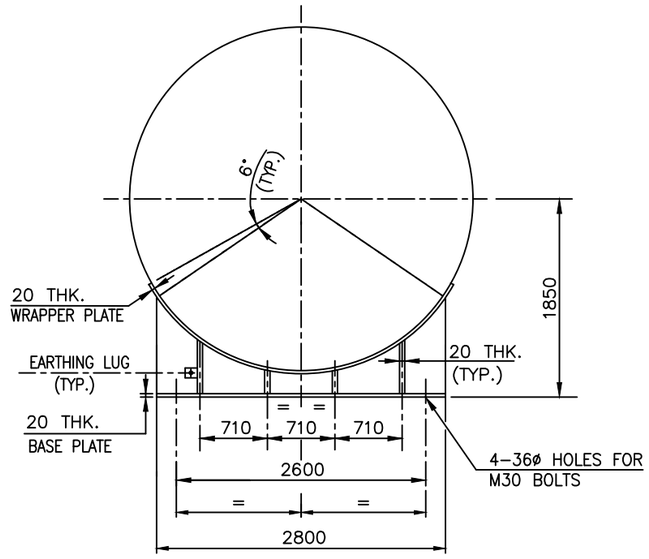


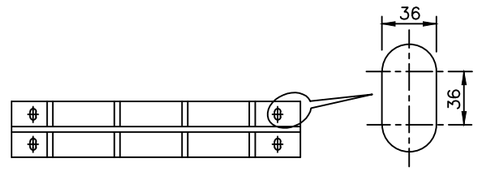


END VIEW

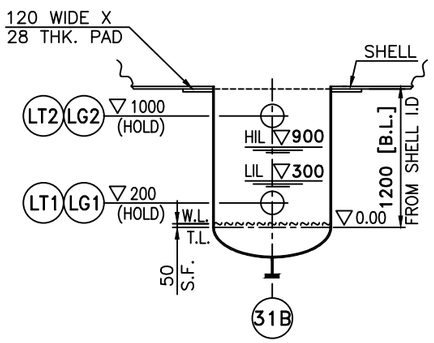
(NOZZLES NOT SHOWN)

(ALL OTHER DIMENSIONS AS PER EIL STD.)

HOLES FOR FIXED SUPPORT



HOLES FOR SLIDING SUPPORT



BOOT DETAIL

A	28.08.2025	ISSUED FOR BIDS/ENGG.	NS	SA/VIVEK	PB		
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
C4 FEED SURGE DRUM
ITEM NO. 301-VV-HW-1601

वेसेल डिजाइन डाटा
सी4 फीड सर्ज ड्रम
आइटम नम्बर 301-वीवी-एचडब्लू-1601

DRAWING NO. B957-301-80-42-DS-3101
REV. A
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS B957-301-79-41-DS-1202 REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
1	1	600	$	300	SRWN	RF	$	-	MANHOLE+B.F.+ DAVIT
3	1	200	$	300	SRWN	RF	$	-	VENTILATION NOZZLE
6	1	80	$	600	SRWN	RF	$	-	VAPOR OUTLET TO 301-EE-00-1603
7	1	80	$	600	SRWN	RF	$	-	VAPOR OUTLET TO 300-EE-00-2006A/B
11	1	900	$	300	SRWN	RF	$	-	FEED FROM 301-EE-00-1602
17	1	900	$	300	SRWN	RF	$	-	LIQUID BOTTOM OUTLET TO 301-PA-CF-1602A/B/C
B 20	1	200	$	300	SRWN	RF	$	-	MIN FLOW FROM 301-PA-CF-1602A~C
31 A-B	2	80	$	600	SRWN	RF	$	-	DRAIN
34	1	250 (H)	$	300	SRWN	RF	$	-	SAFETY VALVE
35	1	50.8 I.D.	$	600	SRLWN	RF	1000	-	UTILITY CONNECTION
LG1/ LT1	2	50.8 I.D.(H)	-	300	LWN	RF	320	-	LEVEL GAUGE/ LEVEL TRANSMITTER
SP 1-2	2	50.8 I.D.(H)	$	300	SRLWN	RF	$	-	STAND PIPE
LT 3-4	2	50.8 I.D.(H)	$	300	SRLWN	RF	$	-	LEVEL TRANSMITTER(DP)
LT2 LG2	2	50.8 I.D.(H)	$	300	SRLWN	RF	$	-	LEVEL TRANSMITTER/ LEVEL GAUGE

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

$ REFER SHEET-3

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
SEISMIC (MC)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
15. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC.
16. VENDOR SHALL ENSURE THAT FOR NOZZLE ABOVE 600 NB PIPE O.D. SHALL MATCH WITH CORRESPONDING STANDARD FLANGE O.D.
17. EXCHANGER MOUNTING FLANGE (FOR 301-EE-00-1603) SHALL BE AS PER DETAIL GIVEN IN SHEET-2, FLANGE GASKET & BOLTING SHALL BE SUPPLIED BY VENDOR.
18. B EQUIPMENT SHALL BE FIRST COMPLETELY FABRICATED, HYDROTESTED AND PWHT AT SHOP. THEREAFTER EQUIPMENT BOOT AND EXCHANGER MOUNT MAY BE CUT (i.e. IN MAXIMUM THREE SECTIONS) (REFER CUTTING LOCATION MARKED IN SHEET.2) (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). EQUIPMENT SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY EQUIPMENT FABRICATOR. 100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY EQUIPMENT FABRICATOR. NDT & PWHT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC.SEAM. COMPLETE HYDROTEST OF THE ENTIRE EQUIPMENT AT SITE IS NOT ENVISAGED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABILITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS.	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	-
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
B X	PROCESS DATA SHEET	B957-301-79-41-DS-1202

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	FIXED / SLIDING SUPPORT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	INNER PROJECTION FOR NOZZLE 60		PIPE DAVIT
X	FLANGE OF NOZZLE 60		PACKING SUPPORT
B	NOZZLE RATING		

DESIGN DATA (डिजाइन डाटा)

CODE			ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	TOP 26.7	BOTT. -
DESIGN PRESSURE	(kg/cm^2g)	INT. 37	EXT. -
WORKING TEMPERATURE	(°C)	TOP 40	
DESIGN TEMPERATURE	(°C)	B 130	
MDMT	(°C)	1.1	
CORROSION ALLLOWANCE	(MM)	3	
TYPE OF HEAD		2:1 ELLIPTICAL	
JOINT EFFICIENCY		SHELL 1	HEAD 1
RADIOGRAPHY		SHELL FULL	HEAD FULL
POST WELD HEAT TREATMENT		YES (NOTE -14)	
HEAT TREATMENT		AS PER CODE / SPEC.	
OPERATING MEDIUM		-	
SP. GRAVITY		0.545 (AT OPERATING TEMP.)	
WIND SPECIFICATION		IS-875 (PART-3)	
SEISMIC		IS-1893 (PART-4) + SITE SPECTRA	
CAPACITY	(M^3)	256	
PAINTING/CLEANING		AS PER JOB SPEC.(REFER NOTE-14)	
INSULATION THICKNESS	(mm)	NIL ☐ HOT ☐ COLD	
FIRE PROOFING CLEATS		☐ YES ☒ NO	
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)	
PRESSURE (NEW & COLD)		48.1	
INSPECTION BY		X EIL ☐ CIB ☐ TPIA	

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/BOOT	SA 516 Gr.70
REINFORCEMENT PAD/INSERT PLATE	SA 516 Gr.70
HEADS	SA 516 Gr.70
~~SHELL FLANGES~~/SR/LWN	SA 350 Gr.LF2 CL.1
NOZZLE FLANGES	SA 350 Gr.LF2 CL.1
NOZZLE NECK UPTO 250 NB	SA 106 GR.B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 Gr.WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ SUPPORT	SA 516 Gr.70 / IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 Gr.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70 / IS 2062 GR. E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 Gr.70
PAD FOR EXTERNAL ATTACHMENT	SA 516 Gr.70

B

EQUIPMENT SHALL BE TRANSPORTED IN MAXIMUM THREE PIECES

@ EXCLUDING EXCHANGER (301-EE-00-1630) WEIGHT

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	161000 @	OPERATING	320000
HYDROTEST(SHOP)	417000	HYDROTEST (FIELD)	446000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	03.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB
A	20.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER डाईग नम्बर	REV
C4 HP FLASH DRUM	सी4 एचपी फलैश डम	B957-301-80-42-DS-3102	B
ITEM NO. 301-VV-HW-1602	आइटम नम्बर 301-वीवी-एचडब्लू-1602	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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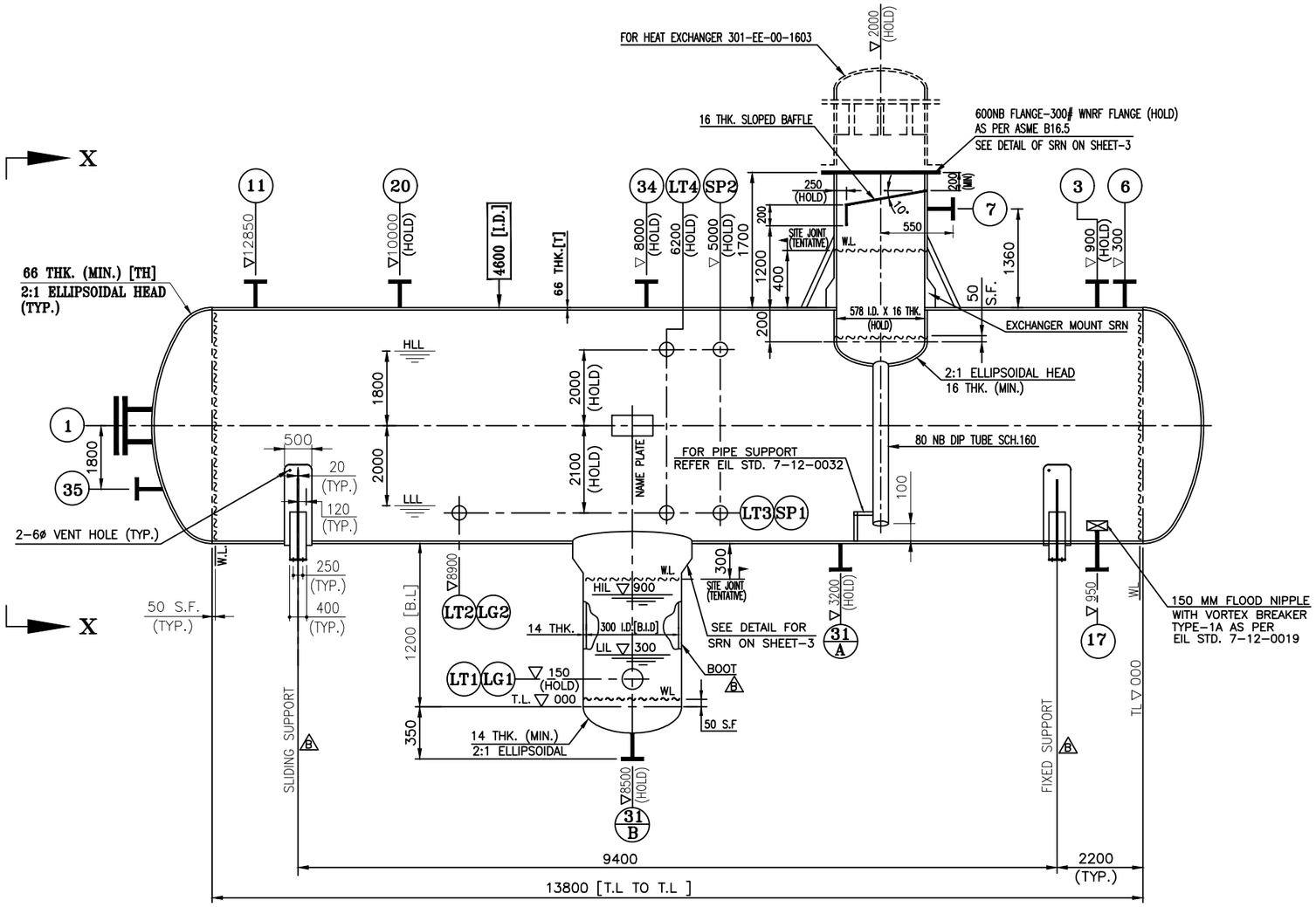
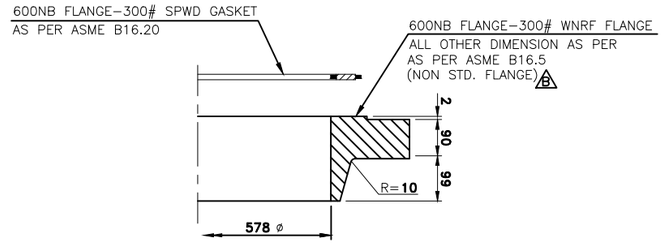
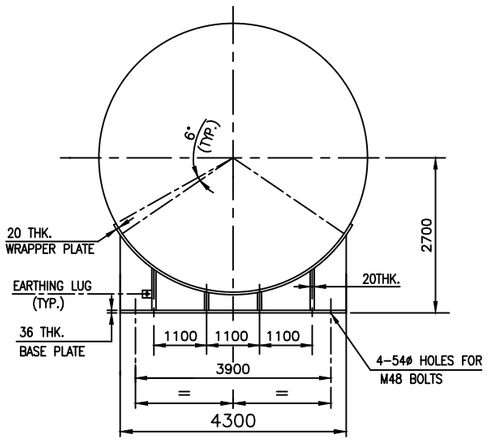
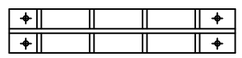




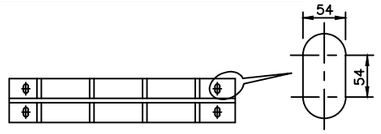
EXCHANGER MOUNTING FLANGE
(HOLD)



VIEW X-X
(NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



HOLES FOR FIXED SUPPORT



HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	03.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	
A	20.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	

VESSEL DESIGN DATA
C4 HP FLASH DRUM
ITEM NO. 301-VV-HW-1602

वेसल डिजाइन डाटा
सी4 एचपी फलैश ड्रम
आइटम नम्बर 301-वीवी-एचडब्लू-1602

DRAWING NO. B957-301-80-42-DS-3102 | REV. B
SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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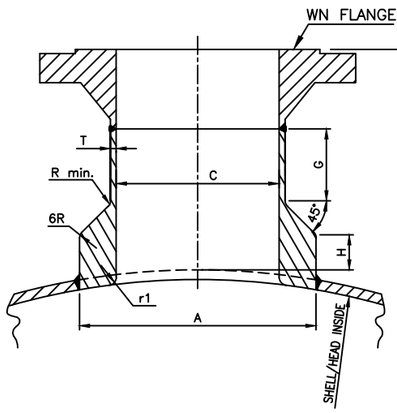

FIG.–1

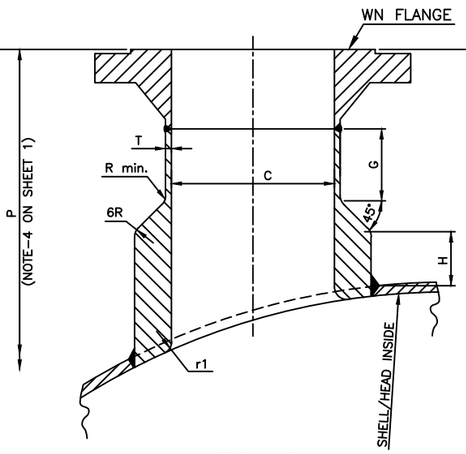

FIG.–2

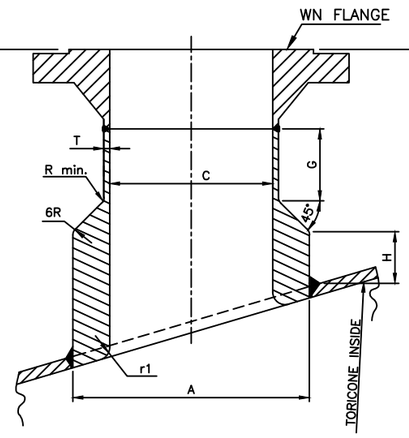

FIG.–3

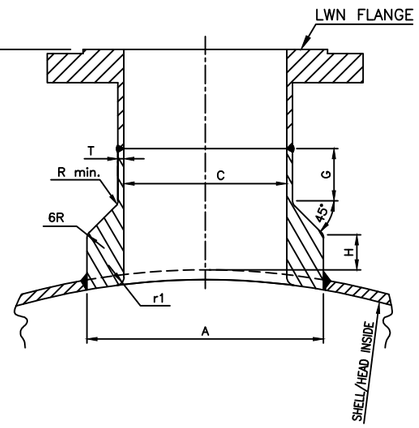

FIG.–4

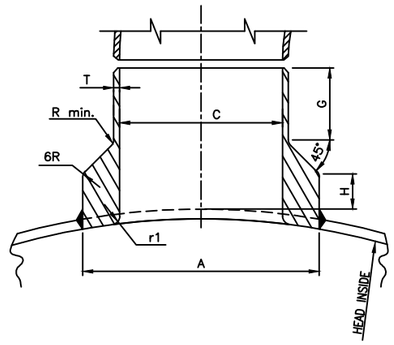

FIG.–5

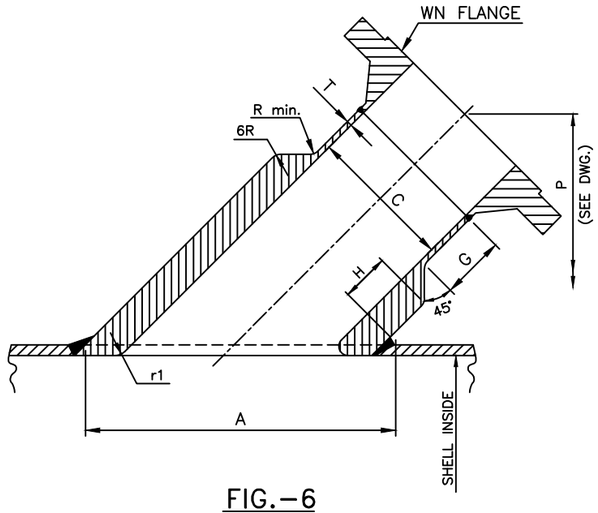

FIG.–6

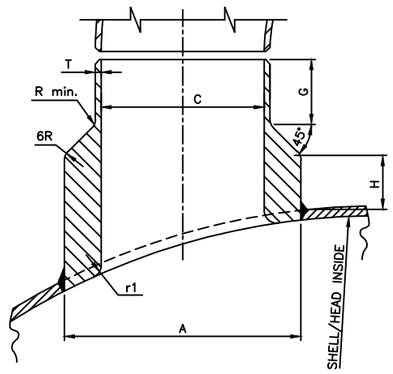

FIG.–7

	NOZZLE MARK	SIZE (NB)	P (MM) (NOTE–1)	A (MM)	C (MM)	H (MM) (MIN.)	T (MM)	G (MM) (MIN.) NOTE–(1)	FIG.
	1	600	1690	822	582	140	14THK.	50	1
	3	200	2765	333.7	193.7	140	SCH 80	50	1
	6	80	2765	146.64	66.64	75	SCH 160	50	1
	7	80	SEE DWG.	136.65	66.65	75	SCH 160	50	1
	11/17	900	2920	1280.75	880.75	140	20THK.	50	1
	20	200	2765	333.7	193.7	140	SCH.80	50	1
	31A	80	2610	146.65	66.65	75	SCH120	50	1
	31B	80	SEE DWG.	146.65	66.65	75	SCH120	50	1
	34	250	2765	405	245	120	SCH.60	50	1
	35	50	SHEET–1	130.8	50.8	75	16.67THK.	50	2
HOLD	EXCH.MOUNT SRN	600	BY VENDOR	867	578	160	16THK.	50	5
HOLD	LT4,SP2	50	1480	130.8	50.8	75	16.67THK.	50	2
HOLD	SP1,LT2 LG2,LT3	50	1320	130.8	50.8	75	16.67THK.	50	2
	SUMP/BOOT	300 I.D.	BY VENDOR	480	300	120	14THK.	50	5

NOTE:–

1. PROJECTION 'P' SHALL BE MAINTAINED. 'G' VALUE FURNISHED ARE MINIMUM AND SHALL BE SUITABLY INCREASE TO MAINTAIN PROJECTION 'P'.
2. RADIUS 'R min','r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE.

DETAIL OF SELF REINFORCED WELD NECK NOZZLE

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	03.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	
A	20.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	

VESSEL DESIGN DATA
C4 HP FLASH DRUM
ITEM NO. 301-VV-HW-1602

वेसल डिजाइन डाटा
सी4 एचपी फलैश ड्रम
आइटम नम्बर 301-वीवी-एचडब्लू-1602

DRAWING NO. B957–301–80–42–DS–3102
REV. B
SHEET 3 OF 3

1–1641–0503 REV.0 A3–420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
1	1	500	14 THK.	300	WN	RF	820	215X T	MANHOLE + BF + DAVIT
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	250	80	300	WN	RF	720	115X T	FEED FROM 301-EE-00-1604
17	1	250	80	300	WN	RF	SEE DWG.	135X T	LIQUID BOTTOM OUTLET TO LP. CONDENSATE HEADER
35	1	50	160	600	WN	RF	670	-	UTILITY CONNECTION
LT 1-2	2	50(H)	160	300	WN	RF	670	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50(H)	160	300	WN	RF	670	-	LEVEL MAGNETIC (SS)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	3.3
DESIGN PRESSURE (kg/cm²g)	INT. 38.5 EXT. FV
WORKING TEMPERATURE (°C)	146
DESIGN TEMPERATURE (°C)	240
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.921 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	1.52
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)	40 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	50.05
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	SA 106 GR. B
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	-
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
LIFTING LUG	SA 516 GR.70

PLATFORM OR PIPE CLIP NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	2600	OPERATING	3600
HYDROTEST(SHOP)	4200	HYDROTEST (FIELD)	4200
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	14.08.2025	ISSUED FOR BIDS / ENGG.	AS	SM/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
CONDENSATE POT FOR 301-EE-00-1604	कन्डनसेट पॉट फॉर 301-ईई-00-1604
ITEM NO. 301-VV-VW-1603	आइटम नम्बर 301-वीवी-वीडब्ल्यू-1603

DRAWING NUMBER डाईग नम्बर	REV
B957-301-80-42-DS-3103	A
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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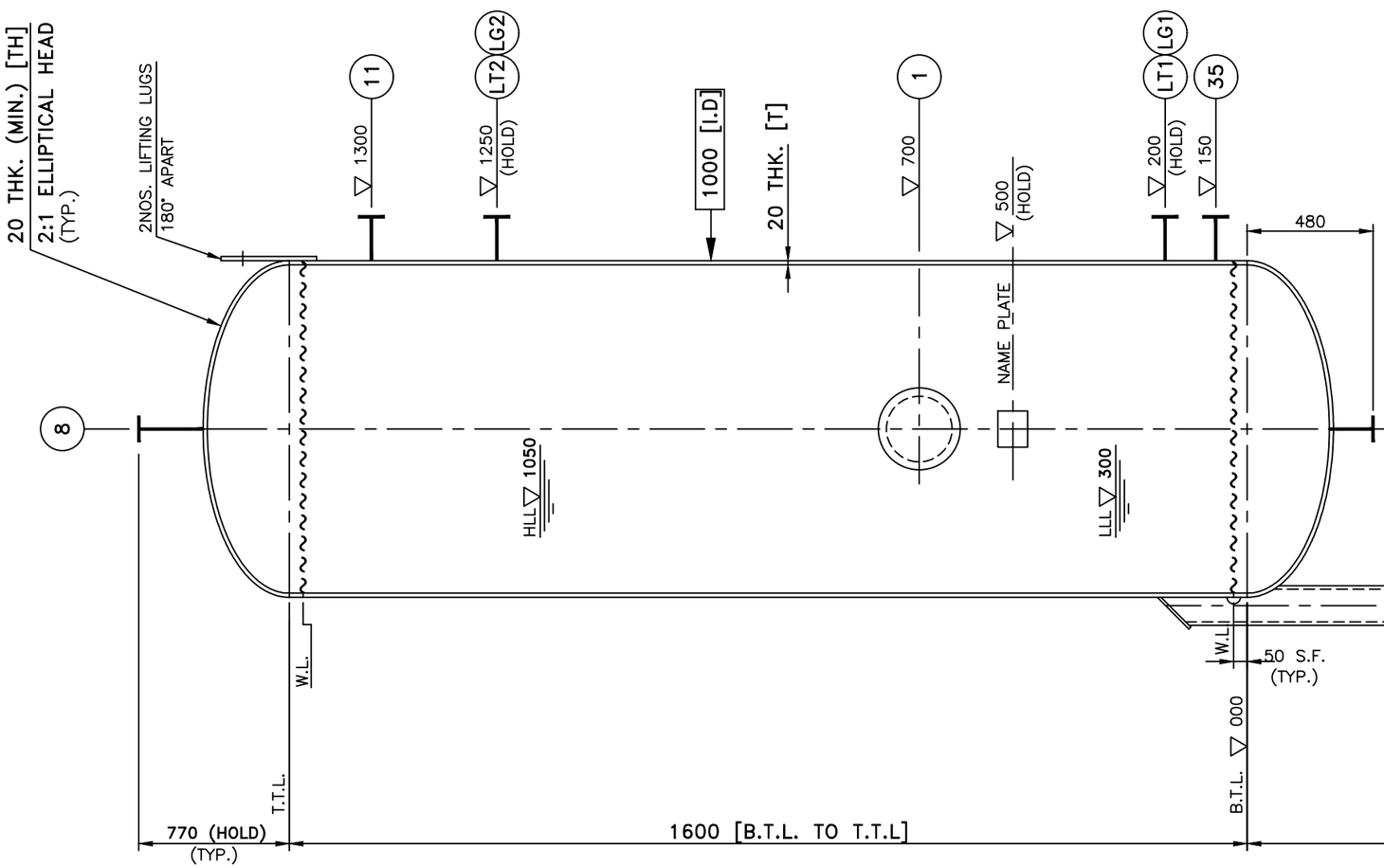

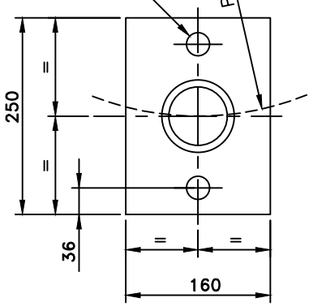

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	14.08.2025	ISSUED FOR BIDS/ENGG.	AS	SM/VIVEK	PB	

VESSEL DESIGN DATA
CONDENSATE POT FOR
301-EE-00-1604
ITEM NO. 301-VV-VW-1603

वेसल डिजाइन डाटा
कन्डनसेट पॉट फॉर
301-ईई-00-1604
आइटम नम्बर 301-वीवी-वीडब्ल्यू-1603

DRAWING NO.	REV.
B957-301-80-42-DS-3103	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेशन	PAD W x T पैड	SERVICE सर्विस
1 A/B	2	750	#	300	SRWN	RF	#	-	MANHOLE + BF + DAVIT
2	1	600	#	300	SRWN	RF	#	-	MANHOLE + BF + DAVIT
3 A/B	2	200	#	300	SRWN	RF	#	-	DUMP NOZZLE
8	1	50	-	600	LWN	RF	SEE SHT. 2	-	VENT
11	1	800	#	300	SRWN	RF	#	-	FEED FROM 300-LZ-00-3002 REGEN GAS
12	1	900	160	300	WN	RF	SEE SHT. 2	-	FEED FROM 301-EE-00-1604, 301-PA-CF-1601 A/B/C
13	1	100	#	600	LWN	RF	#	-	FEED FROM 300-LZ-00-3002
17	1	1050	#	300	SRWN	RF	#	-	BOTTOM OUTLET TO 301-EE-00-1601
21	1	250	#	300	SRWN	RF	#	-	VAPOR DRAWOFF TO 301-EE-00-1602
31	1	80	#	600	SRWN	RF	#	-	DRAIN
35	1	50.8 I.D.	#	600	SRLWN	RF	#	-	UTILITY CONNECTION
36	1	50.8 I.D.(H)	#	300	SRLWN	RF	#	-	PRESSURE GAUGE
37	1	50.8 I.D.(H)	#	300	SRLWN	RF	#	-	PRESSURE CONTROLLER
38A~D	4	76.2 I.D.(H)	#	300	SRLWN	RF	#	-	DIFFERENCIAL PRESSURE TAP
40A~F	6	76.2 I.D.(H)	#	300	SRLWN	RF	#	-	TEMPERATURE WELLS
SP1-2	2	50.8 I.D.(H)	#	300	SRLWN	RF	#	-	STAND PIPE
LT1-2	2	50.8 I.D.(H)	#	300	SRLWN	RF	#	-	LEVEL INDICATOR CONTROLLER
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकश्सन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉऊडेशन लोडिगं डाटा (ऑपरटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	1040000	57000
SEISMIC (MC)		
WIND	166000	12000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125-250 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 900 APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14 FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
15 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
16 ALL INTERNALS & ITS SUPPORTS (EXCEPT CATALYST & INNERT BALLS) SHALL BE DESIGNED AND SUPPLIED BY VENDOR.
17 COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
18 EQUIPMENT SHALL BE SUBJECTED TO STEAM-OUT AT 190°C AND 0.5KG/CM^{2}G
19 EQUIPMENT SHALL BE COMPLETELY FABRICATED, ASSEMBLED AND HYDROTESTED AT FABRICATION SHOP AND SUPPLIED IN SINGLE PIECE.
20 COMPLETE TOP & BOTTOM GRIDS & SCREEN INCLUDING NUT, BOLT, GASKET AND ITS SUPPORTING ARRANGEMENT TO BE DESIGNED AND SUPPLIED BY EQUIPMENT VENDOR.
21 OPERATING/ DESIGN CONDITION:

OPERATING CONDITON	TEMPERATURE, °C S.O.R.	TEMPERATURE, °C E.O.R.	PRESSURE, KG/cm^{2}g S.O.R.	PRESSURE, KG/cm^{2}g E.O.R.
TOP (MAX)	40	60	29.1	29.1
BOTTOM (MAX)	90	104	28.5	27.1
REGENERATION	450		1	

DESIGN CONDITON		
TOP	200	37
BOTTOM	200	37
REGENERATION (HEATING-REGEN.GAS)	250	7.5
REGENERATION (OXIDATION)	500	3.5
REGENERATION (HEATING-STEAM)	150	FV

22 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS)AND BRACING ARRANGEMENT CONSIDERING 1.25 TIMES OF EQUIPMENT ERECTION WEIGHT AND AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.

23 WELD QUALITY FOR SKIRT-SHELL/HEAD JUNCTION : NDT SHALL BE CARRIED OUT AS PER TABLE 5.12 (FATIGUE STRENGTH REDUCTION FACTOR OF 1.5, QUALITY LEVEL OF 3.0) OF ASME SEC VIII DIV.2.

24 EQUIPMENT MAY BE ERECTED IN DRESSED UP CONDITION (BY OTHERS). LIFTING TRUNNION SHALL BE DESIGNED BY VENDOR. MECHANICAL DESIGN OF LIFTING TRUNNION SHALL BE CARRIED OUT CONSIDERING 1.25 TIMES OF EQUIPMENT WEIGHT AND AN IMPACT FACTOR OF 1.5. THE INDUCED STRESS IN SHELL & TRUNNION SHALL BE WITHIN 90% OF YIELD. VENDOR TO PROVIDE INSERT PLATE OF SUITABLE SIZE AND THICKNESS WHEREVER REQUIRED BY ANALYSIS. VENDOR SHALL ENSURE THAT ERECTION / RIGGING SLINGS SHALL NOT FOUL WITH ANY EXTERNAL ATTACHMENTS i.e. NOZZLES, NOZZLE FLANGES, PIPING / PLATFORM / INSULATION CLIPS, PIPE DAVIT BRACKETS, VACUUM STIFFENERS, SHELL GIRTH FLANGE ETC. AND ACCORDINGLY, PROJECTION & ORIENTATION OF TRUNNIONS SHALL BE FIRMED-UP.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
X	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS (FOR GUIDANCE)	7-12-0022
X	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
X	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
X	PROCESS DATASHEET	301-RB-00-1601A/B
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	INSULATION THK./TYP.	X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm^{2}g)	NOTE-21
DESIGN PRESSURE (kg/cm^{2}g)	INT. (NOTE-21) EXT. NOTE-21
WORKING TEMPERATURE (°C)	(NOTE-21)
DESIGN TEMPERATURE (°C)	(NOTE-21)
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-17)
HEAT TREATMENT	AS PER CODE/SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.548 (TOP)/ 0.475 (BOTTOM)
WIND SPECIFICATION	IS 875 (PART-3)
SEISMIC	IS 1893 + SITE SPECTRA (PART-4)
CAPACITY (M^3)	297.6
PAINTING/CLEANING	AS PER JOB SPECIFICATION
INSULATION THICKNESS (mm) (IH)	175 (HOLD) [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	48.1
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/BOOT	SA 516 GR.70
REINFORCEMENT PAD/INSERT PLATE	-
HEADS	SA 516 GR.70
SHELL FLANGES/SR/LWN	SA 350LF2 CL.1
NOZZLE FLANGES	SA 350LF2 CL.1
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 GR.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7/SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ SUPPORT	SA 516 GR.70
SKIRT/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY B
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	SS 304$ B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	-
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0
LIFTING TRUNNION	SA 516 GR.70
SCREEN	SS 304

$ SS 304L CAN ALSO BE USED B

@ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP, AND OPERATIING LIQUID.

NO PLATFORM, LADDER, PIPING SHALL BE SUPPORTED ON THIS EQUIPMENT

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) (HOLD)

ERECTION	231000	OPERATING	410000
HYDROTEST(SHOP)	529000	HYDROTEST (FIELD)	605000

NUMBER OF ITEMS : TWO

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	02.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB
A	09.06.2025	REVISED AS MARKED.	ROHIT	AD/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
C4 HYDROGENATION REACTOR	सी4 हाइड्रोजनेशन रिएक्टर
ITEM NO. 301-RB-00-1601A/B	आइटम नम्बर 301-आरबी-00-1601ए/बी

DRAWING NUMBER डाईग नम्बर	REV
B957-301-80-42-DS-3201	B
SHEET 1 OF 4	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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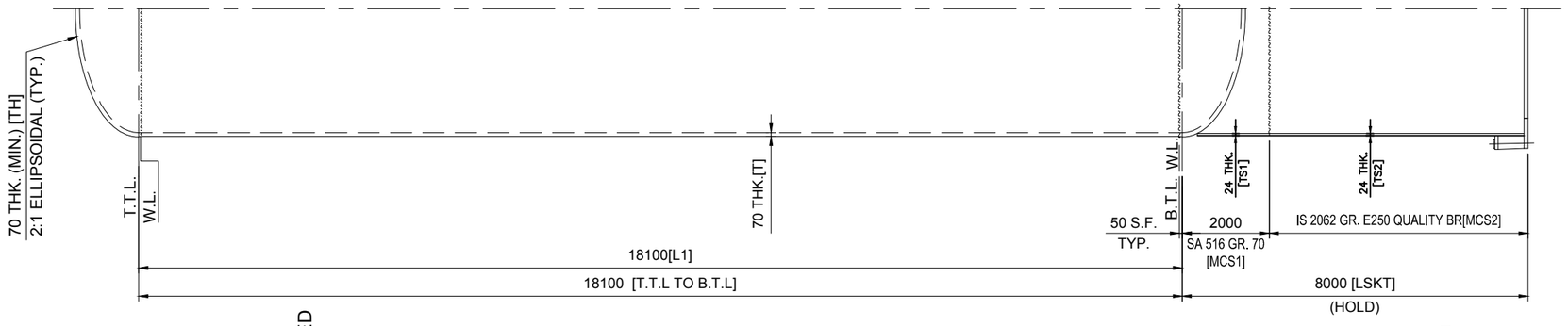
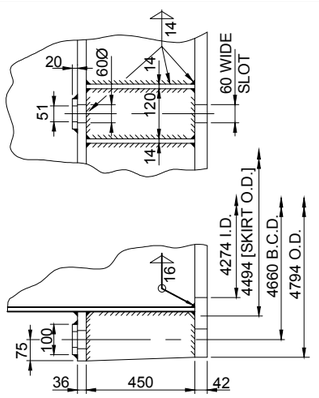
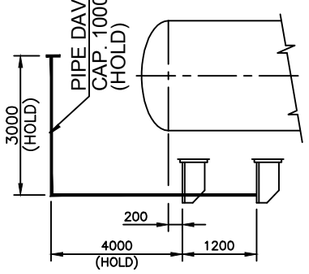


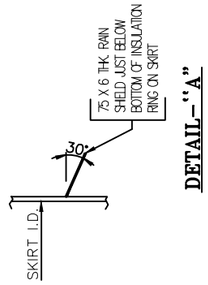


SKIRT BASE DETAIL(HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0004)

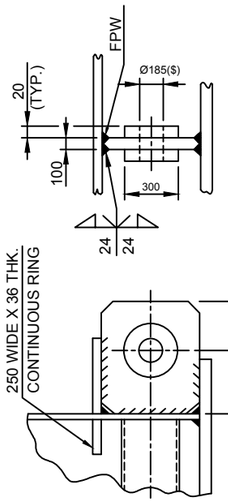


PIPE DAVIT
(AS PER EIL STD.)
(DAVIT TO BE LOOSE SUPPLIED ALONG WITH BRACKETS)

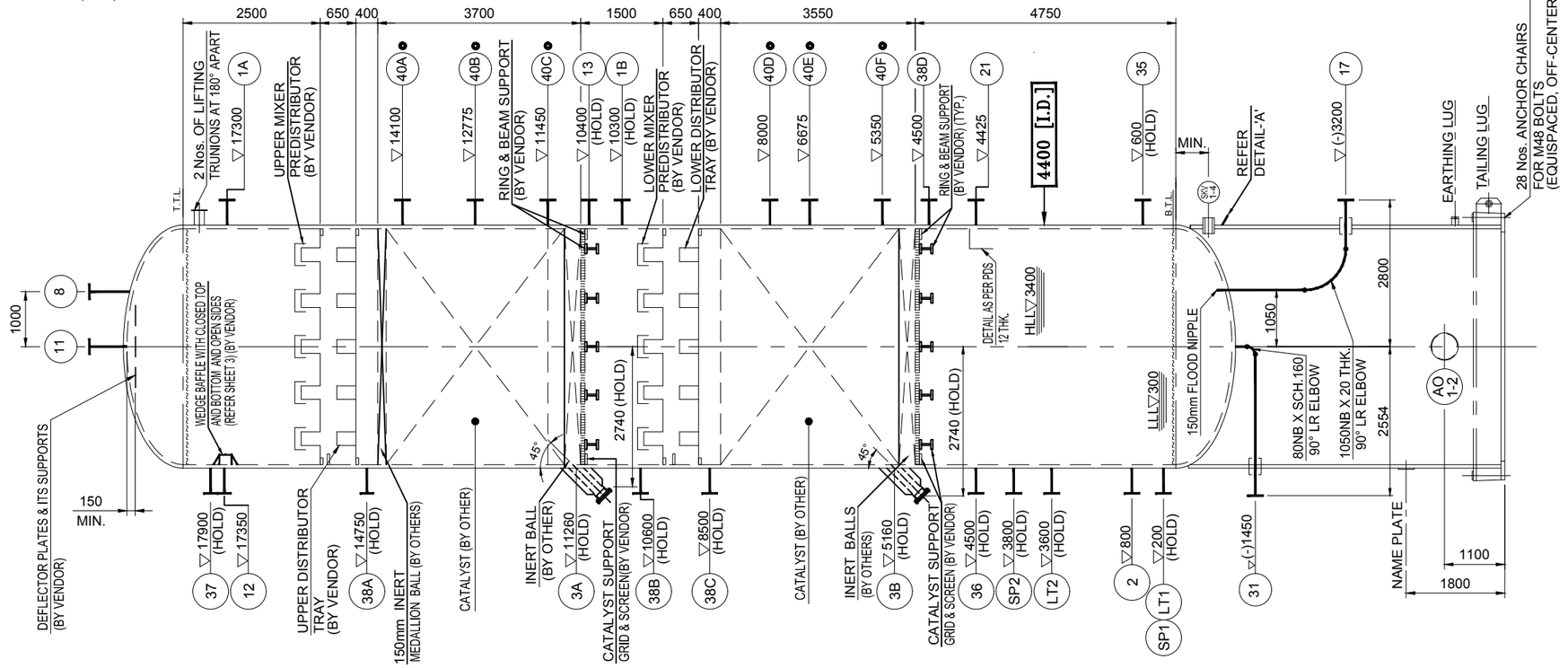
@ 120° TO EACH OTHER

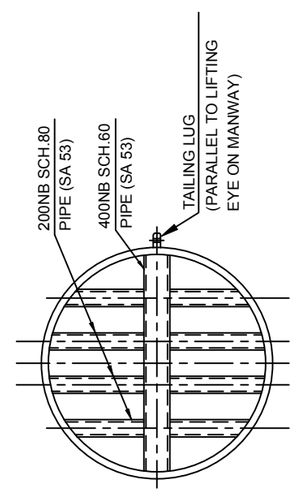


DETAIL – "A"



DETAIL OF TAILING LUG
($) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.





STIFFENING DETAIL OF SKIRT

B	02.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	
A	09.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA	वेसल डिजाइन डाटा
C4 HYDROGENATION REACTOR	सी4 हाइड्रोजनेशन रिएक्टर
ITEM NO. 301-RB-00-1601A/B	आइटम नम्बर 301-आरबी-00-1601ए/बी

DRAWING NO.	REV.
B957-301-80-42-DS-3201	B
SHEET 2 OF 4	

1-1641-0503 REV.0 A3-420x297

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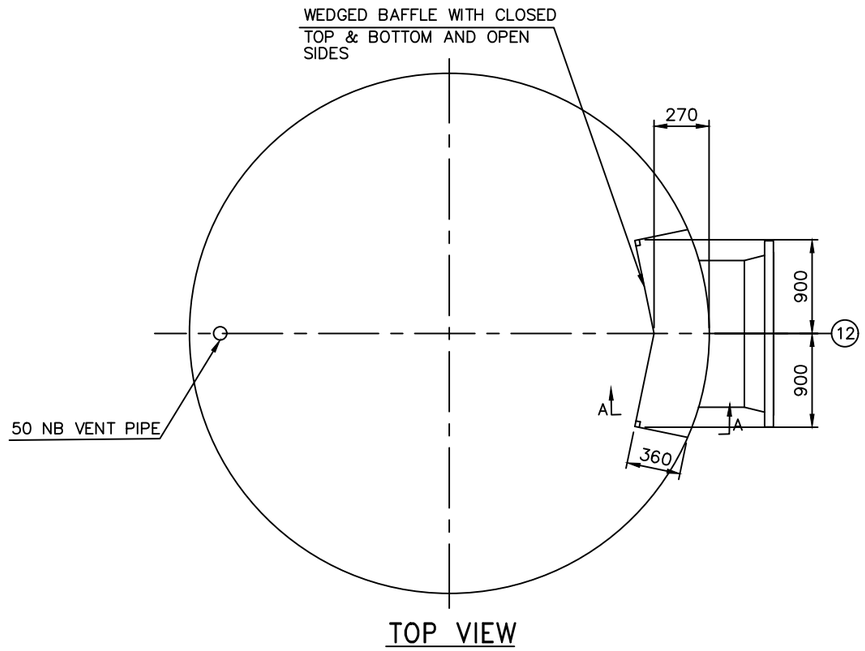
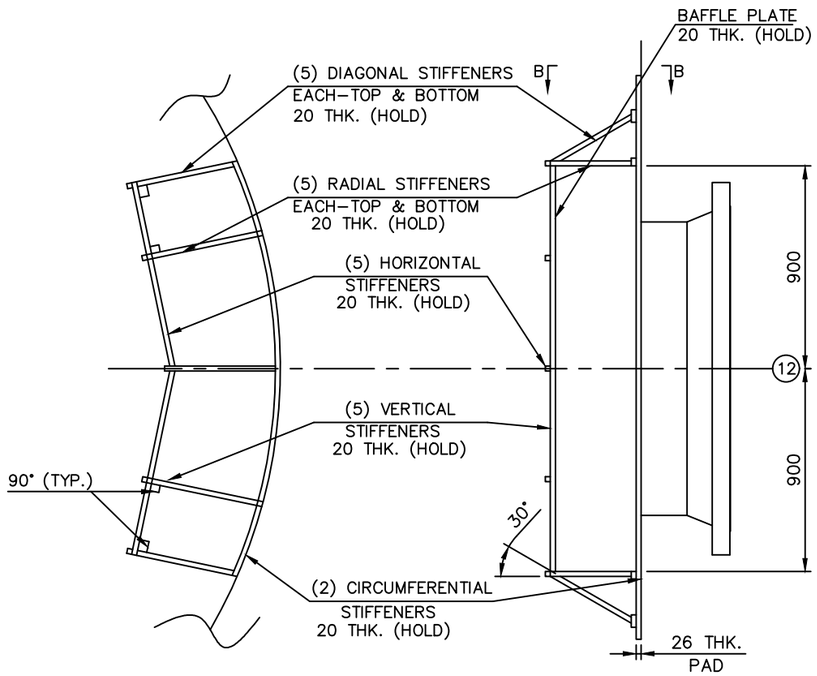


TOP VIEW



SECTION B–B

SECTION A–A

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	02.09.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	
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ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
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आइटम नम्बर 301-आरबी-00-1601ए/बी

DRAWING NO. B957–301–80–42–DS–3201
REV. B
SHEET 3 OF 4

1–1641–0503 REV.0 A3–420x297

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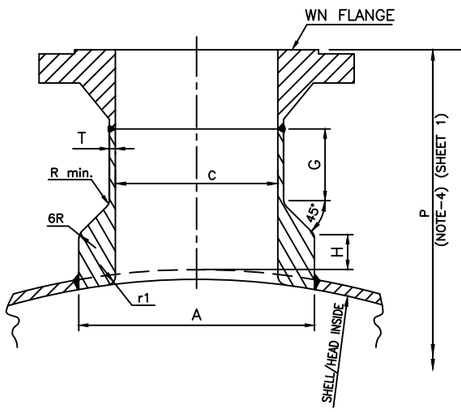

FIG.–1

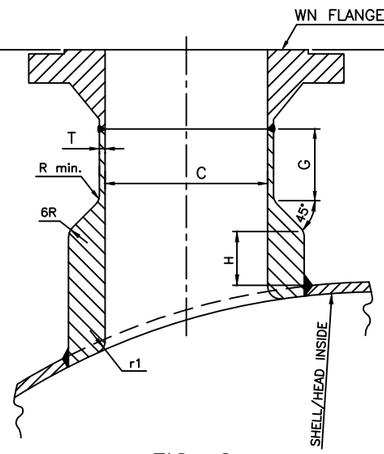

FIG.–2

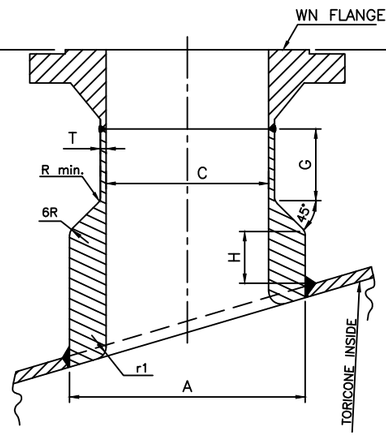

FIG.–3

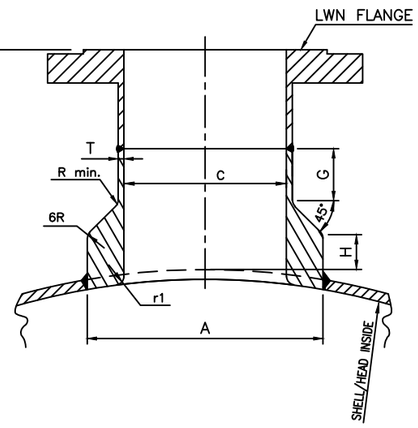

FIG.–4

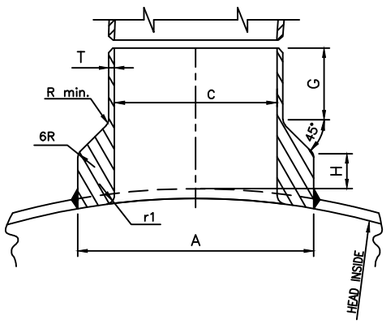

FIG.–5

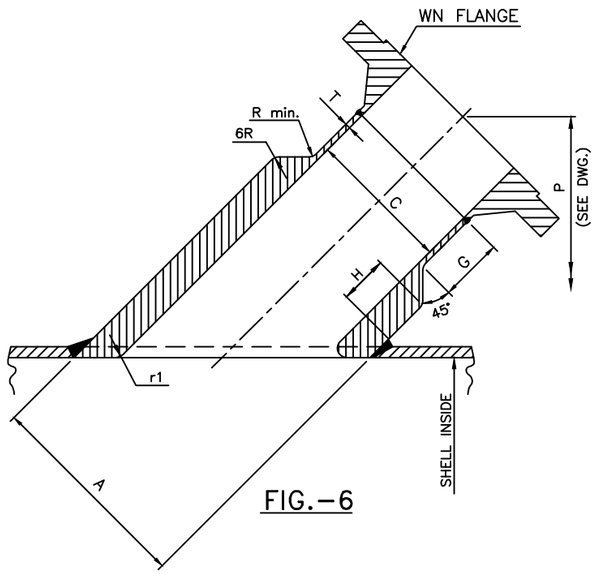

FIG.–6

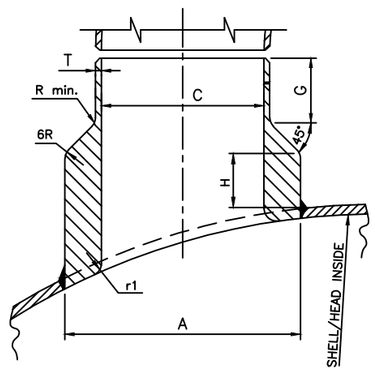

FIG.–7

	NOZZLE MARK	SIZE (NB)	P (MM) (NOTE–1)	A (MM)	C (MM)	H (MM) (MIN.)	T (MM)	G (MM)(MIN.) NOTE–(1)	FIG.
	1A–B	750	2800	1148	768	130	16 THK.	50	1
	2	600	2730	858	578	120	16 THK.	50	1
	3A–B	200	SHEET–2	353.67	193.67	100	SCH. 80	50	6
	8	50	1720	150.8	50.8	75	SCH. 160	50	2
	17	1050	SHEET–2	1534	1034	160	20 THK.	50	7
	31	80	SHEET–2	146.65	66.65	75	SCH. 120	50	5
	11	800	1720	1139.15	779.15	160	20 THK.	50	1
	21	250	2600	395	245	100	14 THK.	50	1
	13	100	2540	192.65	92.05	75	SCH. 160	50	1
HOLD	40A–F,38A–D	76.2 I.D	2440	176.2	76.2	60	20.4 THK.	50	4
	12	900	2850	1281	881	160	20 THK.	50	1
	35	50.8 I.D.	2430	120.8	50.8	50	16.76	50	1
HOLD	36,37	50.8 I.D.	2430	120.8	50.8	50	16.76	50	1
HOLD	SP1–2,LT1–2	50.8 I.D.	2430	120.8	50.8	50	16.76	50	1

NOTE:–

1. PROJECTION 'P' SHALL BE MAINTAINED. 'G' VALUE FURNISHED ARE MINIMUM AND SHALL BE SUITABLY INCREASED TO MAINTAIN PROJECTION 'P'.
2. RADIUS 'R min','r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE.

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

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A	09.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	

VESSEL DESIGN DATA
C4 HYDROGENATION REACTOR
ITEM NO. 301-RB-00-1601A/B

वेसल डिजाइन डाटा
सी4 हाइड्रोजनेशन रिएक्टर
आइटम नम्बर 301-आरबी-00-1601ए/बी

DRAWING NO. B957–301–80–42–DS–3201 | REV. B

SHEET 4 OF 4

1–1641–0503 REV.0 A3–420x297

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PDS REV.0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड B	सर्विस
1A-B	2	600	14 THK.	150	WN	RF	1370	300X T	MANHOLE + BF + GASKET + BOLTING
1C-F	4	600	14 THK.	150	WN	RF	1770	300X T	MANHOLE + BF + GASKET + BOLTING
7	1	400	14 THK	150	WN	RF	SEE DWG.	200X T	VAPOR OUTLET TO 302-EE-00-2605
8	1	50	160	600	WN	RF	970	-	VENT
10	1	150	80	150	WN	RF	1320	85X T	REFLUX IN FROM 302-PA-CF-2603A/B
11	1	200	80	150	WN	RF	1720	110X T	FEED FROM 302-VV-VW-2605
14	1	500	14 THK.	150	WN	RF	SEE DWG.	250X T	TO REBOILER 302-EE-00-2604
15	1	750	20THK.	150	WN	RF	1770	380X T	FROM REBOILER 302-EE-00-2604
17	1	250	80	150	WN	RF	SEE DWG.	135X T	LIQUID BOTTOM OUTLET TO 302-CC-00-2602
31	1	80	160	150	WN	RF	SEE DWG.	45X T	DRAIN
35	1	50	160	150	WN	RF	1670	-	UTILITY CONNECTION
36	1	50 (H)	160	300	WN	RF	1670	-	PRESSURE GAUGE
38A	1	50 (H)	160	300	WN	RF	1270	-	PRESSURE DIFFERENTIAL/TRANSMITTER
38B-C	1	50 (H)	160	300	WN	RF	1670	-	PRESSURE DIFFERENTIAL/TRANSMITTER
40A	1	50 (H)	160	300	WN	RF	1270	-	TEMPERATURE INDICATOR
40B	1	50 (H)	160	300	WN	RF	1670	-	TEMPERATURE INDICATOR
41	1	50 (H)	160	300	WN	RF	1670	-	TEMPERATURE CONTROLLER
45A-B	2	50	160	300	WN	RF	1670	-	LEVELGAUGE ON STAND PIPE WITH HHL ALARM
46A-B	2	50	160	300	WN	RF	1670	-	LEVEL INDICATOR
47A-B	2	50	160	300	WN	RF	1670	-	LEVEL CONTROLLER
AO	1	500 ID	14 THK.	AS PER EIL STD.				255 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/TORICONE/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लाडिंगं डाटा (आपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	426000	20500
WIND	1010000	34500

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
11 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
12 SURFACE PREPARATION, PRIMER & FINISH PAINT SHALL BE CARRIED OUT AT YARD BY EQUIPMENT VENDOR AS PER PAINTING SPEC.
13 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
14 COLUMN SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/cm^2g @190^0C.
15 EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION, PLATFORM/LADDERS ETC. (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT.
16 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
17 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDETHE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
18 UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED CS INTERNAL SHALL BE 12mm & BOLTED INTERNAL SHALL BE 9mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
19 COLUMN SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM THREE SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF COLUMN SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). COLUMN SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY COLUMN FABRICATOR. 100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY COLUMN FABRICATOR. NDT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE COLUMN AT SITE IS NOT
20 ALL PRESSURE INSTRUMENTS TO BE LOCATED IN THE VAPOR SPACE.
21 LOCATE ALL TEMPERATURE INSTRUMENT NOZZLE(S) WITHIN THE CLEAR LIQUID PORTION OF THE DOWNCOMER APPROXIMATELY 50 MM ABOVE THE TRAY DECK. TEMPERATURE INSTRUMENT NOZZLE #40B AND #40A TO BE LOCATED IN THE DOWNCOMER OF TRAY #7 &#46. TEMPERATURE INSTRUMENT NOZZLE #41 13 TO BE LOCATED IN THE DOWNCOMER OF TRAY #23.
22 50mm FROM BOTTOM DISH HEAD UPTO TRAY #23.
40mm FROM TRAY #23 AND ABOVE.
23 SUPPLY OF ALL PIPE DISTRIBUTOR AND ITS SUPPORT IS IN VENDOR SCOPE.
24 AT TOP, MAXIMUM PRESSURE DROP OF 0.52 KG/SQ.CM & LIQUID LEVEL OF 15190 MM DUE TO LIQUID OVERALL CASE (I.E. TOTAL 5.6 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
25 B COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
26 B ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES (FOR GUIDANCE)	7-12-0018
X	VORTEX BREAKERS (FOR GUIDANCE)	7-12-0019
X	INLET DEFLECTOR BAFFLE (FOR GUIDANCE)	7-12-0020
X	SUPPORT RING AND BOLTING BAR (FOR GUIDANCE)	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
X	PROCESS DATA SHEET	302-CC-00-2601

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
X	NOZZLE RATING	X	PIPE DAVIT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	TOP:2.74 BOTTOM:3.26
DESIGN PRESSURE	(kg/cm^2g)	INT. 5.0 EXT. --
WORKING TEMPERATURE	(°C)	TOP:80 BOTTOM:152
DESIGN TEMPERATURE	(°C)	170
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD / CONE 1
RADIOGRAPHY		B SHELL FULL HEAD / CONE FULL
POST WELD HEAT TREATMENT		B YES (NOTE-25)
HEAT TREATMENT		HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		TOP:0.649 BOTTOM: 0.711
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	275.2
PAINTING/CLEANING		AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)		50/40 (NOTE-22) [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		6.5
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / TORICONE	SA 516 Gr.70
REINFORCEMENT PAD / ~~INSERT PAD~~	SA 516 Gr.70
HEADS (BOTTOM)	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND WITH SS SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	SA 516 GR.70 / SA 106 GR.B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/B0 OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	SA 106 GR. B
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0
LIFTING TRUNNIONS	SA 516 GR.70
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

@INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

SITE ASSEMBLED COLUMN

SPECIAL SERVICE : BENZENE/ AROMATIC B

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)
DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	91000	OPERATING	354000
HYDROTEST(SHOP)	366000	HYDROTEST (FIELD)	480000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	06.11.2025	REVISED & REISSUED FOR BIDS / ENGG.	ROHIT	SA/VIVEK	PB
A	04.07.2025	ISSUED FOR BIDS / ENGG.	AS	CS/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
DEPENTANIZER	डीपेंटनाइजर	B957-302-80-42-DS-3001	B
ITEM NO. 302-CC-00-2601	आइटम नम्बर 302-सीसी-00-2601	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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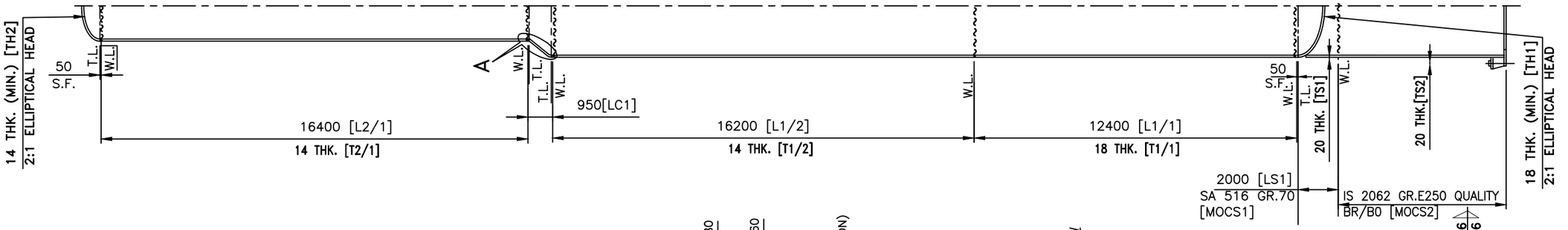
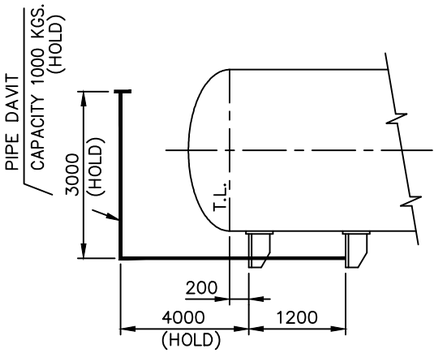
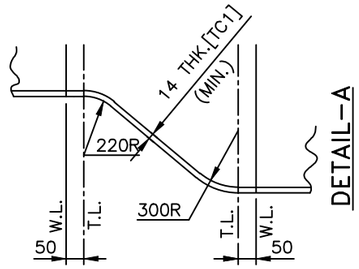


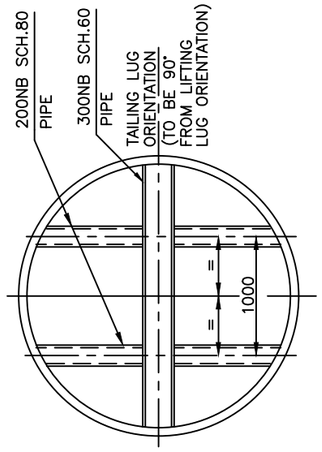


PIPE DAVIT (HOLD)

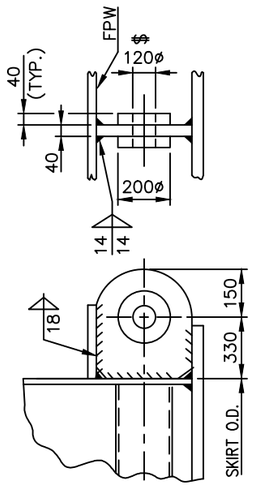
(ALL OTHER DIMENSIONS AS PER EIL STD.)



DETAIL–A

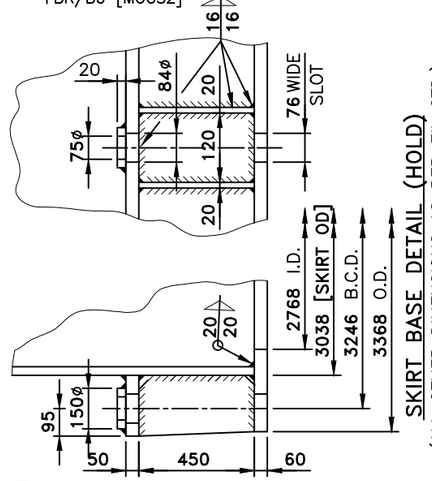


STIFFENING DETAIL OF SKIRT



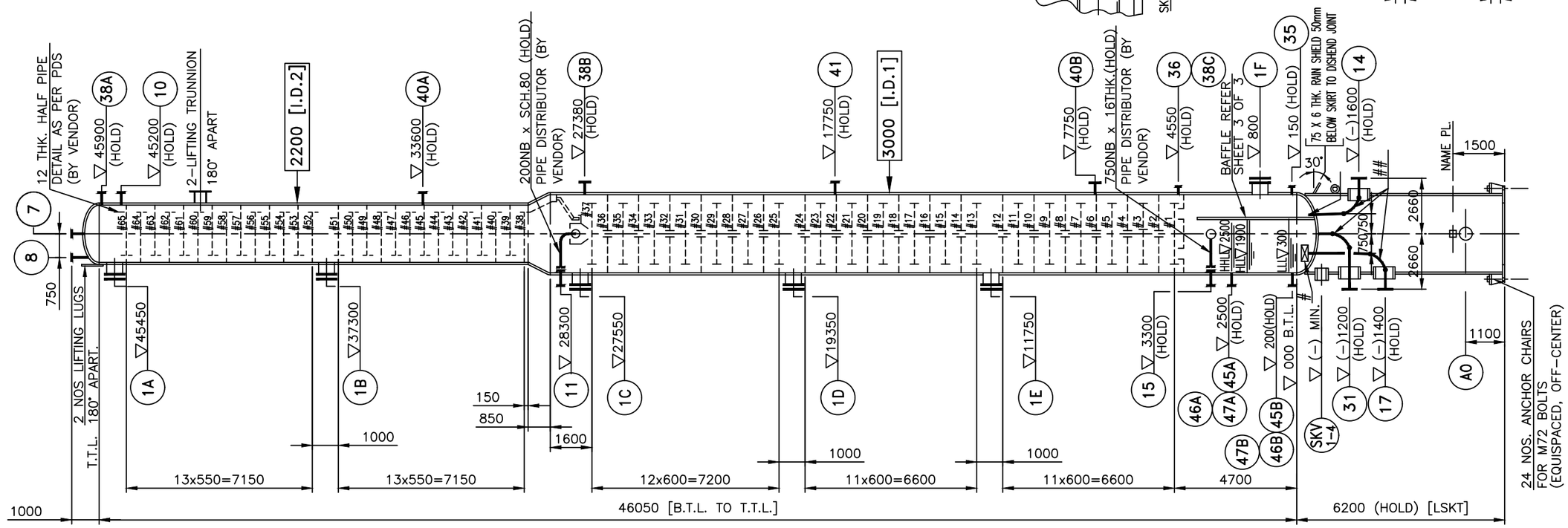
TAILING LUG DETAIL

$ VENDOR TO ENSURE ADEQUACY OF HOLE DIA.



SKIRT BASE DETAIL (HOLD)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



B	06.11.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB	
A	04.07.2025	ISSUED FOR BIDS/ENGG.	AS	CS/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA	वेसल डिजाइन डाटा	DRAWING NO.	REV.
DEPENTANIZER	डीपेंटनाइजर	B957–302–80–42–DS–3001	B
ITEM NO. 302-CC-00-2601	आइटम नम्बर 302–सीसी–00–2601	SHEET 2 OF 3	

1–1641–0503 REV.0 A3–420x297

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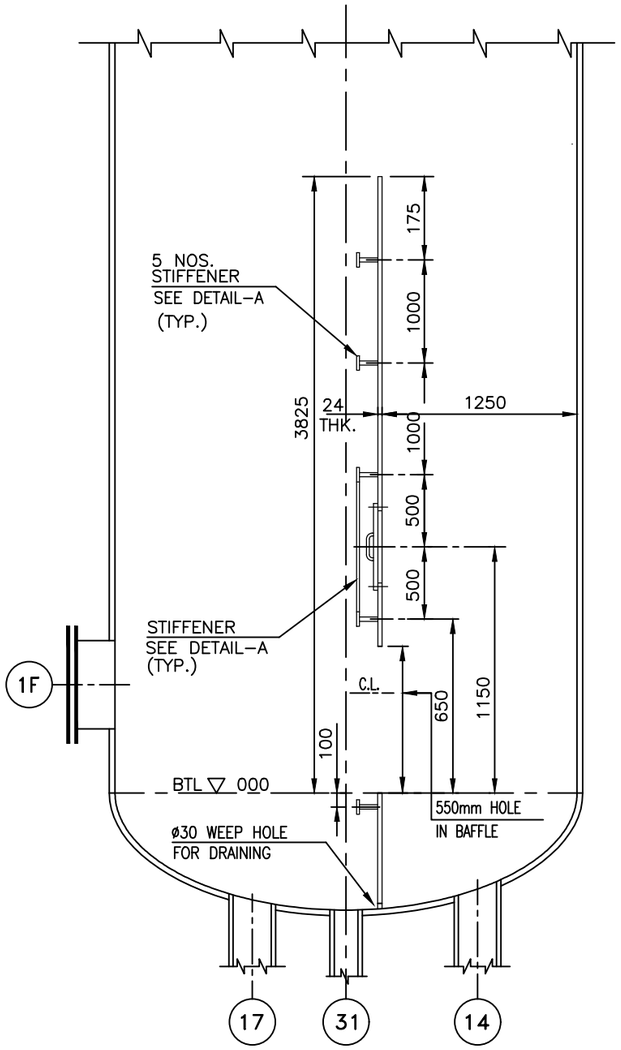
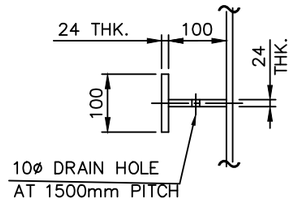
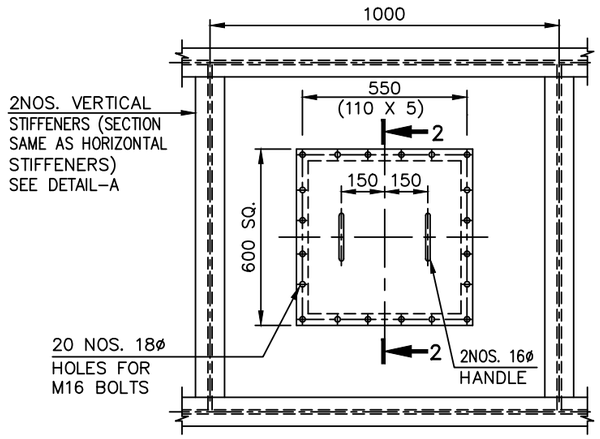


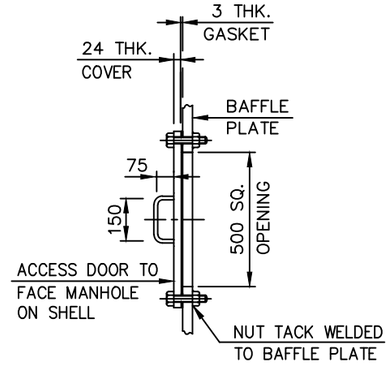
COLUMN BOTTOM DETAIL
(FOR OTHER DETAILS REFER PDS)



DETAIL–'A'



DETAIL OF MANWAY
ON BAFFLE



SECTION 2–2

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	06.11.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CS/VIVEK	PB	
A	04.07.2025	ISSUED FOR BIDS/ENGG.	AS	CS/VIVEK	PB	

VESSEL DESIGN DATA
DEPENTANIZER
ITEM NO. 302–CC–00–2601

वेसेल डिजाइन डाटा
डीपेंटनाइजर
आइटम नम्बर 302–सीसी–00–2601

DRAWING NO.	REV.
B957–302–80–42–DS–3001	B
SHEET 3 OF 3	

1–1641–0503 REV.0 A3–420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेशन	पैड	सर्विस
1A,B, D	3	600	14 THK.	150	WN	RF	2830	300X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
1C	1	900	14 THK.	150	WN	RF	2880	455X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
7	1	1200	22 THK.	150	WN	RF	SEE DWG.	610X T	VAPOR OUTLET TO 302-EE-00-2608A/B
8	1	50	160	300	WN	RF	SEE DWG.	45X T	VENT
10	1	200	80	150	WN	RF	2780	110X T	REFLUX IN FROM 302-PA-CF-2604A/B
11	1	600	14 THK.	150	WN	RF	2830	300X T	FEED FROM 302-CC-00-2601
15	1	1500 (H)	22 THK.	150	WN	RF	2980	@	FROM REBOILER 302-EE-00-2607
17	1	900	14 THK.	150	WN	RF	SEE DWG.	455X T	LIQUID BOTTOM OUTLET TO 302-PA-CF-2606A/B, 302-PA-CF-2607A/B
20	1	200 (H)	80	150	WN	RF	2780	110X T	MIN. FLOW RETURN FROM 302-PA-CF-2607A/B
31	1	80	160	300	WN	RF	SEE DWG.	45X T	DRAIN
35	1	50	160	300	WN	RF	2730	-	UTILITY CONNECTION
36	1	50 (H)	160	300	WN	RF	2730	-	PRESSURE GAUGE (NOTE-16)
38A-C	3	50 (H)	160	300	WN	RF	2730	-	PRESSURE DIFFERENTIAL INDICATOR (NOTE-16)
40A-B	2	50 (H)	160	300	WN	RF	2730	-	TEMPERATURE INDICATOR
41	1	50 (H)	160	300	WN	RF	2730	-	TEMPERATURE CONTROLLER
45A-B	2	50 (H)	160	300	WN	RF	2730	-	LEVEL GAUGE ON STAND PIPE WITH HHL ALARM
46A-B	2	50 (H)	160	300	WN	RF	2730	-	LEVEL INDICATOR
47A-B	2	50 (H)	160	300	WN	RF	2730	-	LEVEL CONTROLLER
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

(H) DENOTES HOLD

@ INSERT PLATE 3880 DIA. X 44 THK. INCLUDING 1:3 TAPPER

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) C
फॉऊडेशन लोडिंगं डाटा (ऑपरटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	1737000	61500
WIND	1570000	61000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4. FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
5. FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
6. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
7. FLANGE GASKET FACE SHALL HAVE 125AARH FINISH.
8. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
9. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
10. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
11. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
12. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
13. SURFACE PREPARATION, PRIMER & FINISH PAINT SHALL BE CARRIED OUT AT YARD BY EQUIPMENT VENDOR AS PER PAINTING SPEC.
14. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
15. EQUIPMENT SHALL BE SUBJECTED TO STEAM OUT AT 0.5 Kg/cm^2(g) @190°C.
16. ALL PRESSURE INSTRUMENTS TO BE LOCATED IN THE VAPOR SPACE.
17. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
18. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
19. LOCATE ALL TEMPERATURE INSTRUMENT NOZZLE(S) WITHIN THE CLEAR LIQUID PORTION OF THE DOWNCOMER APPROXIMATELY 50 MM ABOVE THE BOTTOM OF TRAY DECK. TEMPERATURE INDICATOR #40A TO BE LOCATED IN DOWNCOMER OF TRAY #32. TEMPERATURE INDICATOR #40B TO BE LOCATED IN DOWNCOMER OF TRAY #13. TEMPERATURE INSTRUMENT NOZZLE #41 TO BE LOCATED IN THE DOWNCOMER OF TRAY #3.
20. EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION, PLATFORM/LADDERS ETC. (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT.
21. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED INTERNAL SHALL BE 12mm & BOLTED INTERNAL SHALL BE 9mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
22. AT TOP, MAXIMUM PRESSURE DROP OF 0.25 KG/SQ.CM & LIQUID LEVEL OF 7290 MM DUE TO LIQUID OVERALL CASE (I.E. TOTAL 4.3 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
23. PROJECTION OF VACUUM STIFFENERS (OUTSIDE INSULATION) SHALL BE PROVIDED WITH INSULATION.
24. VACUUM STIFFENING RINGS SHALL NOT BE WELDED TO SHELL UNTIL ALL FOULINGS WITH RESPECT TO PIPING AND STRUCTURAL CLEATS ARE RESOLVED.
25. COLUMN SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM TWO SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF COLUMN SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). COLUMN SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY COLUMN FABRICATOR. 100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY COLUMN FABRICATOR. NDT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE COLUMN AT SITE IS NOT ENVISAGED.
26. 50mm FROM BOTTOM DISH HEAD UPTO TRAY #13. 25mm FROM TRAY #13 AND ABOVE.
27. SUPPLY OF ALL PIPE DISTRIBUTOR AND ITS SUPPORT IS IN VENDOR SCOPE.
28. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	
	DEMISTER DATA SHEET	
X	PROCESS DATASHEEET	302-CC-00-2602
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE (kg/cm^{2}g)	TOP:(-)0.64 BOTTOM:(-)0.39
DESIGN PRESSURE (kg/cm^{2}g)	INT. 3.5 EXT. FV
WORKING TEMPERATURE (°C)	TOP:86 BOTTOM:175
DESIGN TEMPERATURE (°C)	190
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-28)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	TOP:0.779 BOTTOM:0.754
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	524
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-13)
INSULATION THICKNESS (mm) (IH)	50/25 (NOTE-26) [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL /~~ BOOT~~	SA 516 Gr.70
REINFORCEMENT PAD / INSERT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	SS 304
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60/ IS 2062 GR. E 250 QUALITY B
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	SA 516 GR.70
LIFTING TRUNNION	-
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

@ INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

SITE ASSEMBLED COLUMN

SPECIAL SERVICE : BENZENE/ AROMATIC SERVICE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) C

ERECTION	150000	OPERATING	578000
HYDROTEST(SHOP)	674000	HYDROTEST (FIELD)	972000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA_PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
C	25.11.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB
B	30.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB
A	27.06.2025	ISSUED FOR BIDS / ENGG.	AS	SA/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER डाईग नम्बर	REV
RERUN TOWER	रिरन टॉवर	B957-302-80-42-DS-3002	C
ITEM NO. 302-CC-00-2602	आइटम नम्बर 302-सीसी-00-2602	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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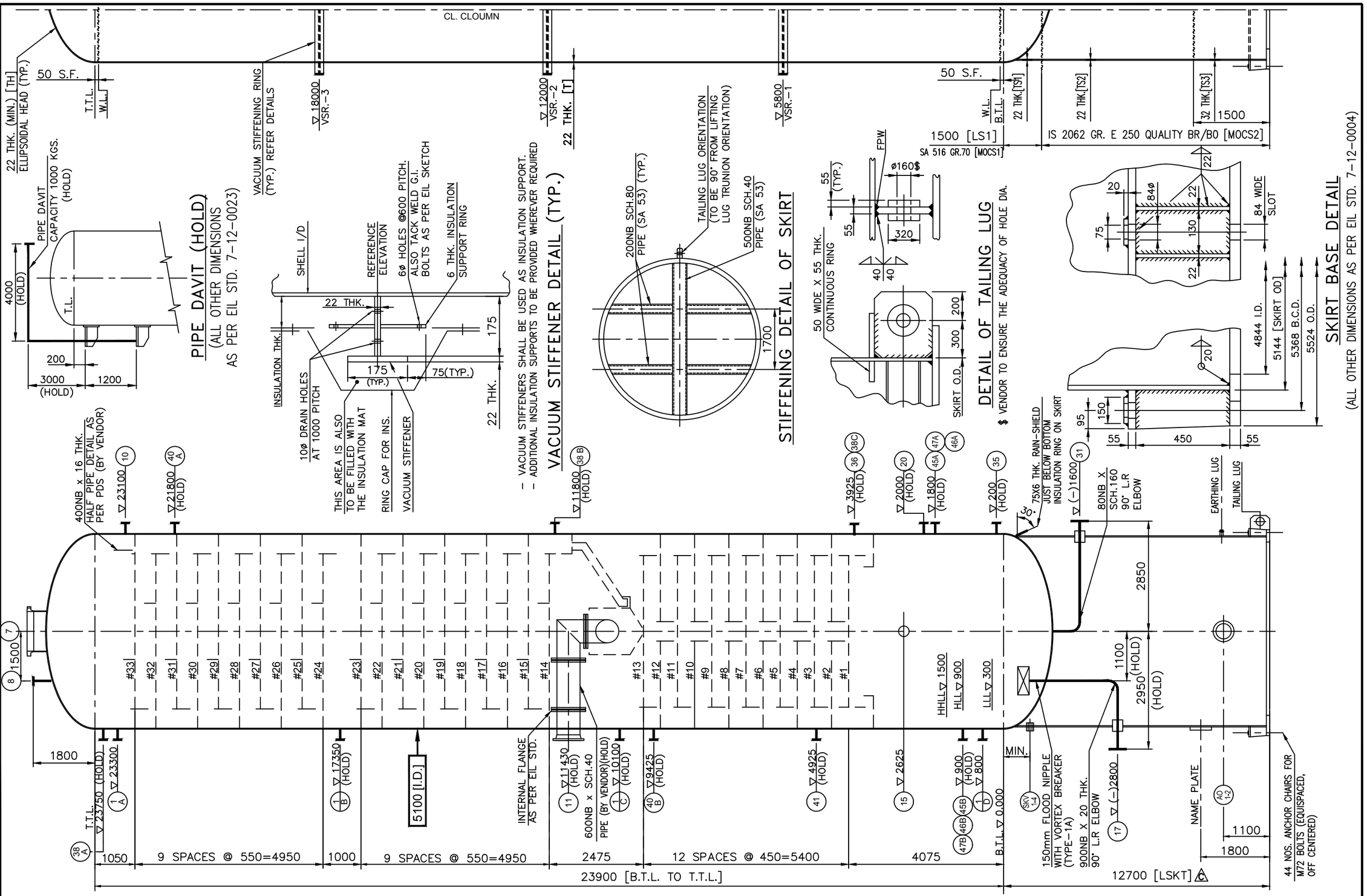

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
C	25.11.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB	
B	30.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB	
A	27.06.2025	ISSUED FOR BIDS/ENGG.	AS	SA/VIVEK	PB	

VESSEL DESIGN DATA
RERUN TOWER
ITEM NO. 302-CC-00-2602

वेसल डिजाइन डाटा
रिरन टॉवर
आइटम नम्बर 302-सीसी-00-2602

DRAWING NO. B957-302-80-42-DS-3002 | REV. C
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेशन	PAD W x T B पैड	SERVICE सर्विस
1A-E	5	600	14 THK.	150	WN	RF	2420	300X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
7	1	800	20 THK.	150	WN	RF	SEE DWG.	405X T	VAPOR OUTLET TO 302-EE-00-2709A/B
8	1	50	160	300	WN	RF	SEE DWG.	45X T	VENT
10	1	200	80	150	WN	RF	2370	110X T	REFLUX IN FROM 302-PA-CF-2703A/B
11	1	300	14 THK	150	WN	RF	2370	160X T	FEED FROM 302-EE-00-2704
14	1	750 (H)	14 THK.	150	WN	RF	SEE DWG.	380X T	TO REBOILER 302-EE-00-2708
15	1	1050 (H)	20 THK.	150	WN	RF	2470	530X T	FROM REBOILER 302-EE-00-2708
17	1	100	120	300	WN	RF	SEE DWG.	60X T	LIQUID BOTTOM OUTLET TO 302-PA-CF-2704A/B
20	1	200 (H)	80	150	WN	RF	2370	110xT	MIN FLOW RETURN FROM 302-PA-CF-2704A/B
31	1	80	160	300	WN	RF	SEE DWG.	45X T	DRAIN
35	1	50	160	300	WN	RF	2320	-	UTILITY CONNECTION
36	1	50 (H)	160	300	WN	RF	2320	-	PRESSURE GAUGE
39A-C	3	50 (H)	160	300	WN	RF	2320	-	PRESSURE DIFFERENTIAL INDICATOR
40A-B	2	50 (H)	160	300	WN	RF	2320	-	TEMPERATURE INDICATOR
41	1	50 (H)	160	300	WN	RF	2320	-	TEMPERATURE CONTROLLER
45A-B	2	50 (H)	160	300	WN	RF	2320	-	LEVEL GAUGE ON STAND PIPE WITH HHL ALARM
46A-B	2	50 (H)	160	300	WN	RF	2320	-	LEVEL INDICATOR
47A-B	2	50 (H)	160	300	WN	RF	2320	-	LEVEL CONTROLLER
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडेशन लोडिगं डाटा (ऑपरटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	1093000	48000
WIND	926000	40500

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4. FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
5. FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
6. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
7. FLANGE GASKET FACE SHALL HAVE 125AARH FINISH.
8. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
9. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
10. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, PRIMER & FINISH PAINT SHALL BE CARRIED OUT AT YARD BY EQUIPMENT VENDOR AS PER PAINTING SPEC.
13. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14. EQUIPMENT SHALL BE SUBJECTED TO STEAM OUT AT 0.5 Kg/cm^2(g) @190°C.
15. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
18. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
19. OLUMN SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM TWO SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF COLUMN SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). COLUMN SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY COLUMN FABRICATOR.100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY COLUMN FABRICATOR. NDT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE COLUMN AT SITE IS NOT ENVISAGED.
20. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED INTERNAL SHALL BE 12mm & BOLTED INTERNAL SHALL BE 9mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
21. AT TOP, MAXIMUM PRESSURE DROP OF 0.33 KG/SQ.CM & LIQUID LEVEL OF 13100 MM DUE TO LIQUID OVERALL CASE (I.E. TOTAL 4.8 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
22. PROJECTION OF VACUUM STIFFENERS (OUTSIDE INSULATION) SHALL BE PROVIDED WITH INSULATION.
23. VACUUM STIFFENING RINGS SHALL NOT BE WELDED TO SHELL UNTIL ALL FOULINGS WITH RESPECT TO PIPING AND STRUCTURAL CLEATS ARE RESOLVED.
24. ALL PRESSURE INSTRUMENTS TO BE LOCATED IN THE VAPOR SPACE.
25. ALL FABRICATED NOZZLE SHALL BE 100% RADIOGRAPHY.
26. EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION, PLATFORM/LADDERS ETC. (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT

26. 65mm FROM BOTTOM DISH HEAD UPTO TRAY #23.
25mm FROM TRAY #23 AND ABOVE.
27. SUPPLY OF ALL PIPE DISTRIBUTOR AND ITS SUPPORT IS IN VENDOR SCOPE.
28. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091. (B)

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	
	DEMISTER DATA SHEET	
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
X	PROCESS DATA SHEET	302-CC-00-2702

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE	(kg/cm^{2}g)	TOP:0.03 BOTTOM:0.36
DESIGN PRESSURE	(kg/cm^{2}g)	INT. 3.5 EXT. FV
WORKING TEMPERATURE	(°C)	TOP:103 BOTTOM:177
DESIGN TEMPERATURE	(°C)	195
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		(B) SHELL 1 HEAD 1
RADIOGRAPHY		(B) SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		(B) YES (NOTE-28)
HEAT TREATMENT		HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		TOP:0.769 BOTTOM:0.740
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	434
PAINTING/CLEANING		AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)		65/25 (NOTE-27) [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		4.55
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / ~~BOOT~~	SA 516 Gr.70
REINFORCEMENT PAD / ~~INSERT PAD~~	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB (SEAMLESS)
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	SS 304
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60/ IS 2062 GR. E 250 QUALITY B
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	SA 516 GR.70
LIFTING TRUNNION	-
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

@ INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

SITE ASSEMBLED COLUMN

SPECIAL SERVICE : (B) **BENZENE/ AROMATIC SERVICE**

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	113000	OPERATING	511000
HYDROTEST(SHOP)	547000	HYDROTEST (FIELD)	791000
NUMBER OF ITEMS :	ONE		

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	30.10.2025	REVISED & REISSUED FOR BIDS / ENGG.	ROHIT	SA/VIVEK	PB
A	27.06.2025	ISSUED FOR BIDS / ENGG.	AS	SA/VIVEK	PB

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA_PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
BTX TOWER	बीटीएक्स टॉवर	B957-302-80-42-DS-3004	B
ITEM NO. 302-CC-00-2702	आइटम नम्बर 302-सीसी-00-2702	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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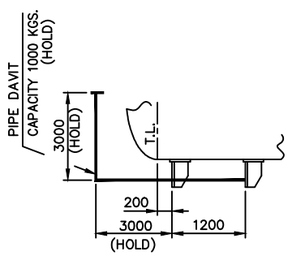


PIPE DAVIT (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD.)

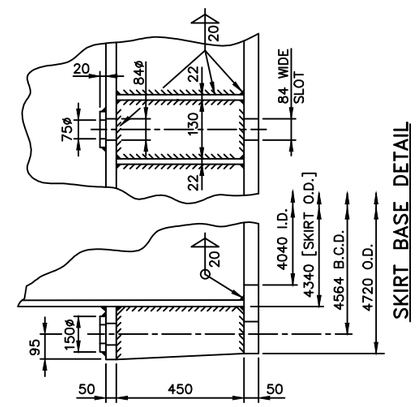
- VACUUM STIFFENERS SHALL BE USED AS INSULATION SUPPORT.
- ADDITIONAL INSULATION SUPPORTS TO BE PROVIDED WHEREVER REQUIRED

VACUUM STIFFENER DETAIL (TYP.)

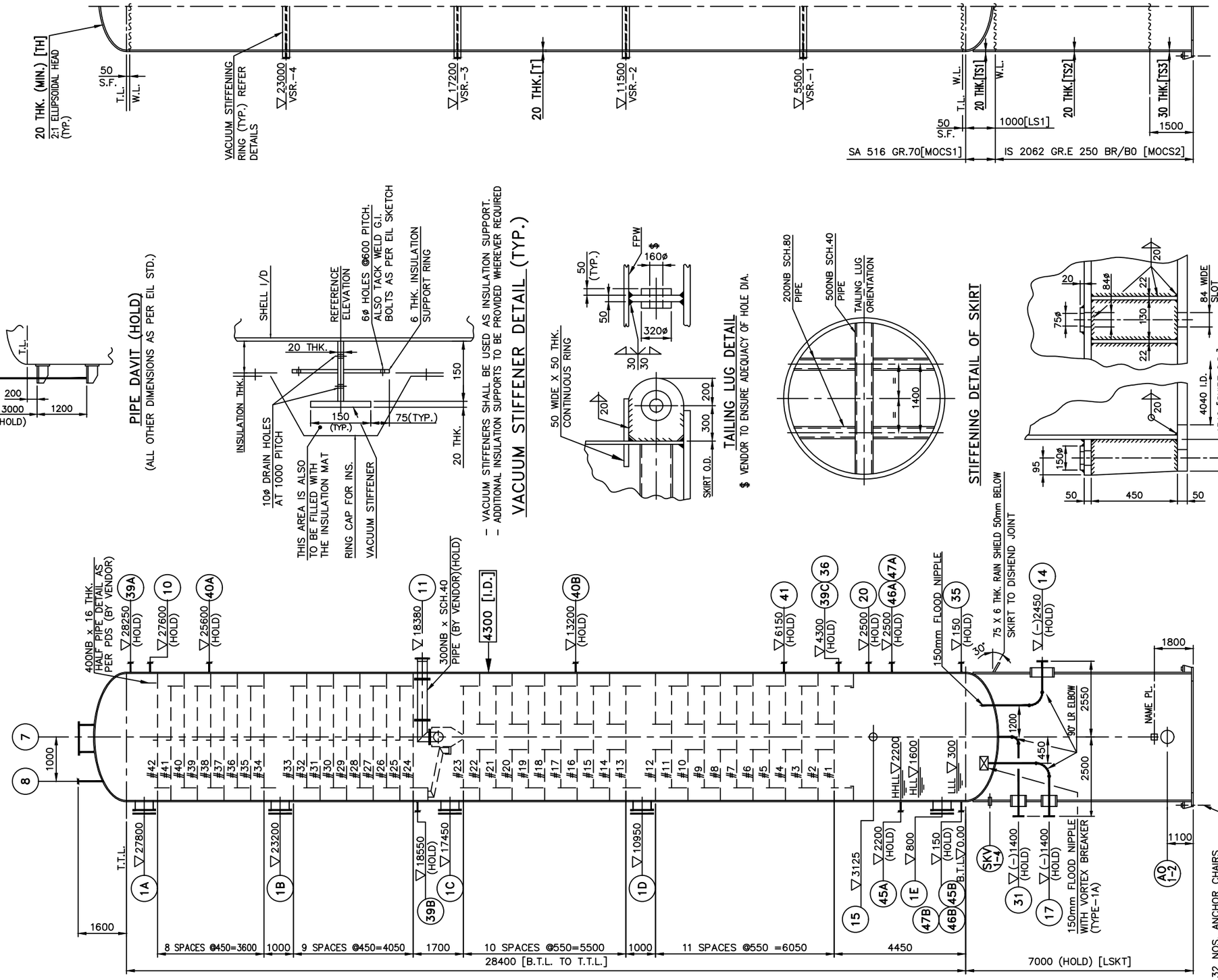
TAILING LUG DETAIL

$ VENDOR TO ENSURE ADEQUACY OF HOLE DIA.

STIFFENING DETAIL OF SKIRT



SKIRT BASE DETAIL
(ALL OTHER DIMENSIONS AS PER EIL STD.)



B	30.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	SA/VIVEK	PB	
A	27.06.2025	ISSUED FOR BIDS/ENGG.	AS	SA/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
BTX TOWER
ITEM NO. 302-CC-00-2702

वेसल डिजाइन डाटा
बीटीएक्स टॉवर
आइटम नम्बर 302-सीसी-00-2702

DRAWING NO. B957-302-80-42-DS-3004 | REV. B

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS: B957-302-79-41-DS-1201 - REV - 2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
1	1	600	14 THK.	150	WN	RF	SEE DWG.	300X T	MANHOLE + BF + DAVIT
3	1	200	80	150	WN	RF	1720	110X T	VENTILATION NOZZLE
6	1	100 (H)	120	300	WN	RF	1720	60X T	VAPOUR OUTLET TO PSV
8	1	50	160	300	WN	RF	1720	-	VENT
11	1	200	80	150	WN	RF	1720	110X T	FEED FROM 302-LZ-00-2601
17	1	250	80	150	WN	RF	1720	135X T	LIQUID BOTTOM OUTLET TO 302-PAS-CF-2601A/B
20	1	100	120	300	WN	RF	1720	60X T	MIN FLOW RETURN FROM 302-PA-CF-2601A/B
31A	1	80	160	300	WN	RF	1520	-	DRAIN
31B	1	80	160	300	WN	RF	SEE DWG.	-	DRAIN
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL GAUGE (MAG) - INT
LT 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL TRANSMITTER (GWR)-INT
LG 3-4	2	50 (H)	160	300	WN	RF	1010	-	LEVEL GAUGE (MAG)
LT 3-10	8	50 (H)	160	300	WN	RF	1010	-	LEVEL TRANSMITTER (DP)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS, NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC
14. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
15. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	
PIPE SUPPORT CLEATS	
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	3.4
DESIGN PRESSURE (kg/cm²g)	INT. 5.5 EXT. --
WORKING TEMPERATURE (°C)	40
DESIGN TEMPERATURE (°C)	65
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-14)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.826 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	46.5
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	7.15
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	IS 2062 GR.E250 QUALITY BR/BO
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60/ IS 2062 GR. E 250 QUALITY BR/BO WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

SPECIAL SERVICE : BENZENE / AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	13500	OPERATING	52000
HYDROTEST(SHOP)	60000	HYDROTEST (FIELD)	64000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	28.08.2025	ISSUED FOR BIDS / ENGG.	AS	SM/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
PGH FEED SURGE DRUM	पीजीएच फीड सर्ज ड्रम	B957-302-80-42-DS-3101	A
ITEM NO. 302-VV-HW-2602	आइटम नम्बर 302-वीवी-एचडब्ल्यू-2602	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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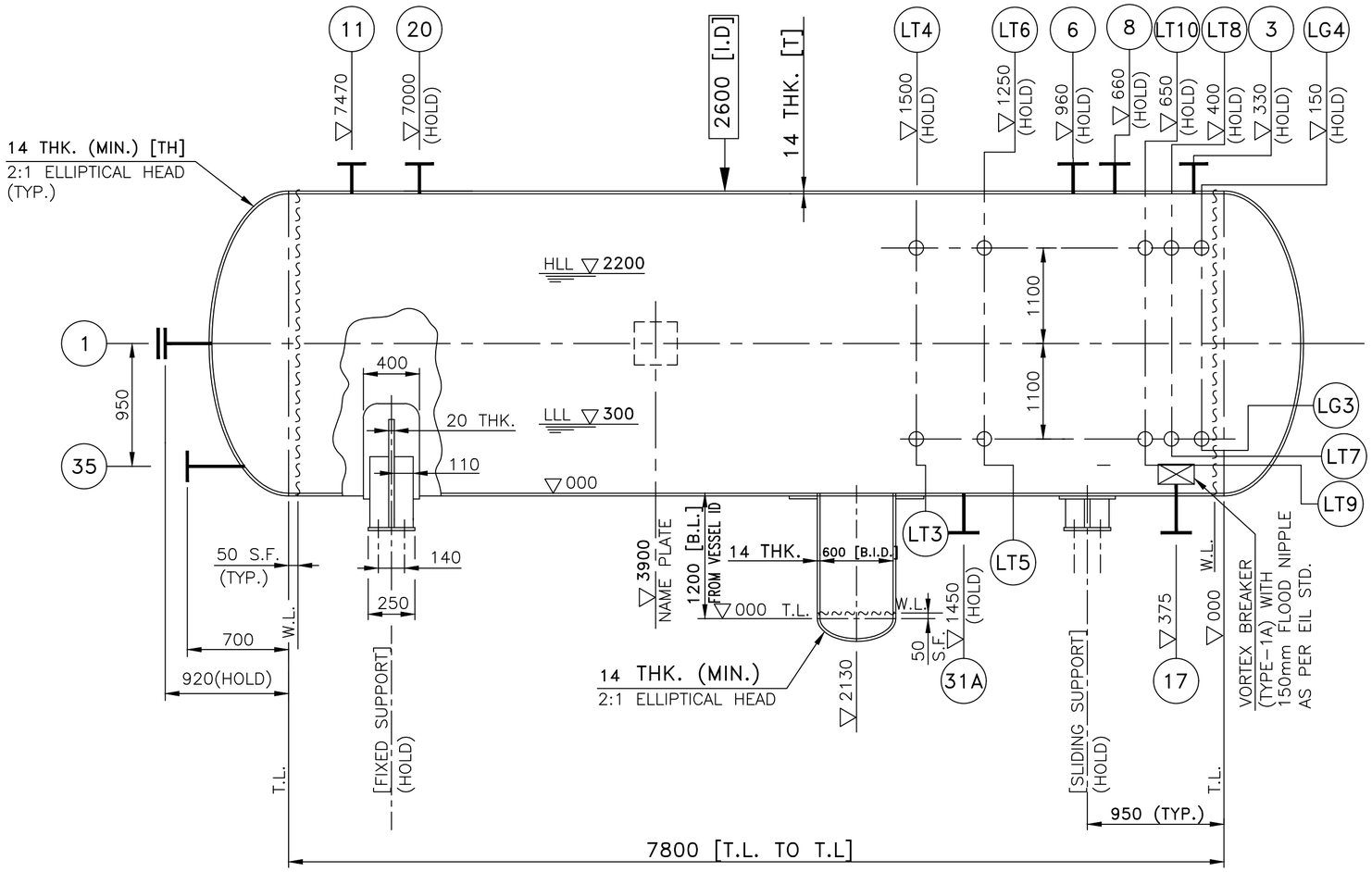
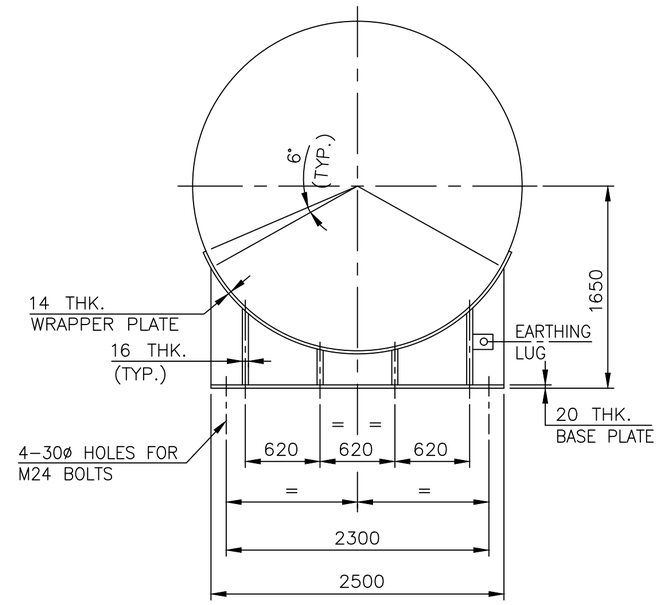
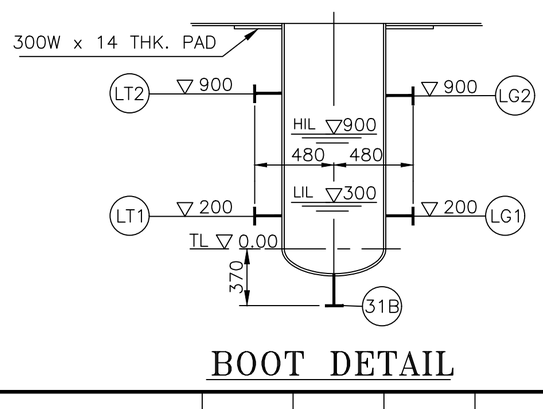




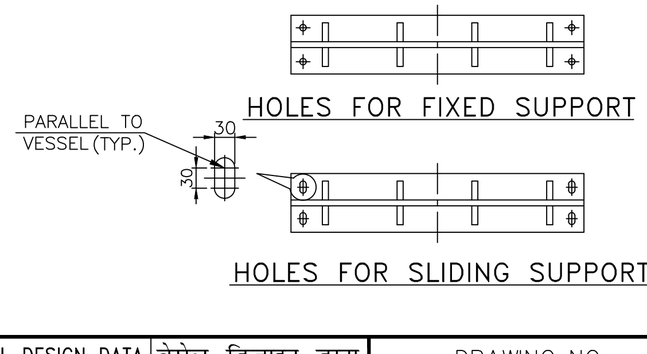
END VIEW

(NOZZLES NOT SHOWN)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



BOOT DETAIL



HOLES FOR FIXED SUPPORT

HOLES FOR SLIDING SUPPORT

A	28.08.2025	ISSUED FOR BIDS/ENGG.	AS	SM/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
PGH FEED SURGE DRUM
ITEM NO. 302-VV-HW-2602

वेसेल डिजाइन डाटा
पीजीएच फीड सर्ज ड्रम
आइटम नम्बर 302-वीवी-एचडब्ल्यू-2602

DRAWING NO. B957-302-80-42-DS-3101

REV. A

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

Page 4014 of 4391 : B957-TENDER DOC-B957-300-16-43-MR-T-3001 : Rev.A

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
5 A-B	2	200	80	300	WN	RF	520	110X T	HANDHOLE + BF + GASKET + BOLTING
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	80	160	600	WN	RF	520	45X T	FEED FROM 302-EE-00-2602
17	1	80	160	600	WN	RF	SEE DWG.	45X T	LIQUID BOTTOM OUTLET TO ML COND. HEADER
35	1	50	160	600	WN	RF	470	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	470	-	LEVEL GAUGE MAGNETIC (SS)
LT 1-2	2	50 (H)	160	300	WN	RF	470	-	LEVEL TRANSMITTER (GWR)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER IBR & MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & ALSO GET THE EQPT. INSPECTED BY CIB.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. PARTS NOT COVERED BY IBR SHALL BE DESIGNED AS PER ASME SEC. VIII DIV.1.
17. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD. TEST FOR FUSION WELDED SEAMS SHALL COMPLY WITH REQUIREMENTS OF IBR.
18. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
19. HYDROTEST SHALL BE CARRIED OUT AS PER IBR REQUIREMENTS.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
X	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LG & LT
X	NOZZLE ELEVATIONS LG & LT		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR (NOTE-16)
WORKING PRESSURE (kg/cm²g)	16
DESIGN PRESSURE (kg/cm²g)	INT. 34 EXT. F.V.
WORKING TEMPERATURE (°C)	203.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL AS PER IBR HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.861 AT OPERATING TEMPERATURE
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	0.35
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR
INSPECTION BY	[ ] EIL [X] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	IS 2062 GR. E 250 QUALITY BR/B0
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	-
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

X **INDIAN BOILER REGULATIONS (IBR)**

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	800	OPERATING	1000
HYDROTEST(SHOP)	1150	HYDROTEST (FIELD)	1150
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	29.08.2025	ISSUED FOR BIDS / ENGG.	AS	VIVEK	PB

DESIGN DATA	डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2602	कन्डनसेट पॉट फॉर 302-ईई-00-2602
ITEM NO. 302-VV-VW-2604	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2604

DRAWING NUMBER / डाईग नम्बर: **B957-302-80-42-DS-3103** REV: A

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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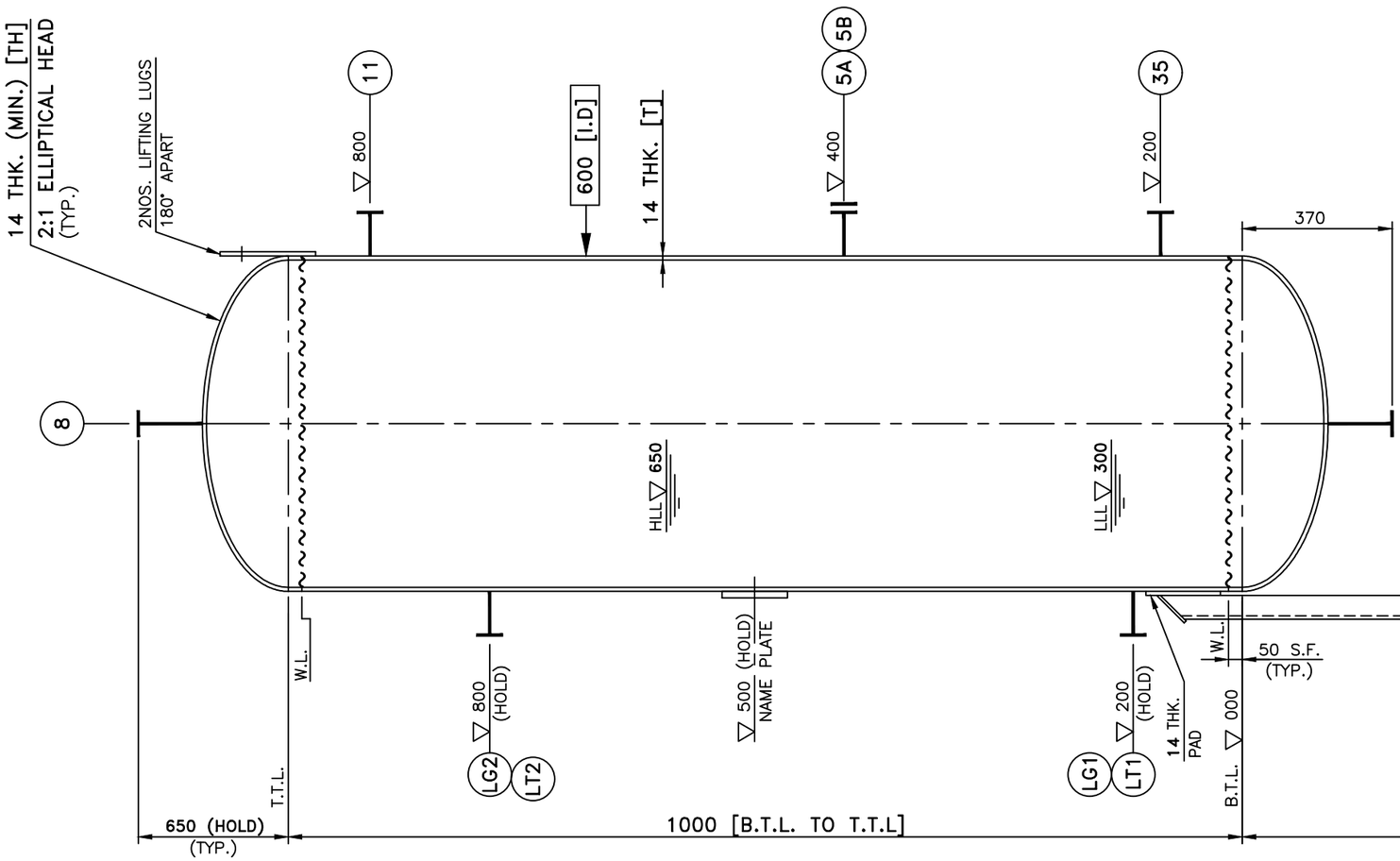

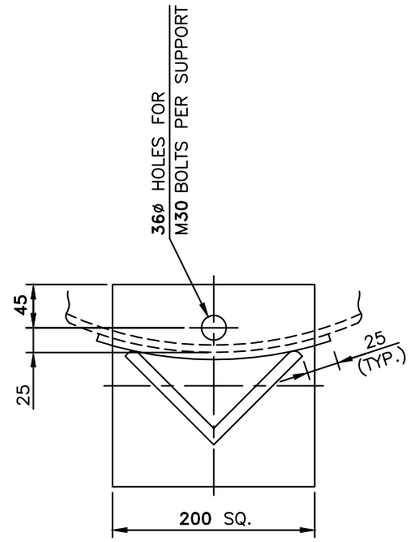

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	29.08.2025	ISSUED FOR BIDS/ENGG.	AS	VVEK	PB	

VESSEL DESIGN DATA	वेसल डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2602	कन्डनसेट पॉट फॉर 302-ईई-00-2602
ITEM NO. 302-VV-VW-2604	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2604

DRAWING NO.	REV.
B957-302-80-42-DS-3103	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS: B957-302-79-41-DS-1204 REV.-1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
1	1	600	14 THK.	150	WN	RF	1170	300X T	MANHOLE + BF + DAVIT
7	1	200 (H)	80	300	WN	RF	SEE DWG.	110xT	VAPOR OUTLET TO PSV / 300-VV-VI-2002
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	200	80	300	WN	RF	1120	200xT	FEED FROM 302-VV-VW-2603
17	1	200	80	300	WN	RF	SEE DWG.	110X T	LIQUID BOTTOM OUTLET TO 302-CC-00-2601
31	1	50	160	600	WN	RF	SEE DWG.	-	DRAIN
35	1	50	160	600	WN	RF	1020	-	UTILITY CONNECTION
LT 1-2	2	50 (H)	160	300	WN	RF	1020	-	LEVEL TRANSMITTER
SP 1-2	2	50 (H)	160	300	WN	RF	1020	-	STAND PIPE
AO	1	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-3	3	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	73000	7000
WIND	42000	4500

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
11. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
12. NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKET.
13. EQUIPMENT SHALL BE STEAM OUT AT 190°C AND 0.5 kg/cm2g.
14. ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
15. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
16. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
17. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS / TRUNNIONS) AND BRACING ARRANGEMENT CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED. (B)

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES 7 , LT1-2 & SP1-2
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 ED.2023
WORKING PRESSURE (kg/cm²g)	6.4
DESIGN PRESSURE (kg/cm²g)	INT. 8.5 EXT. -
WORKING TEMPERATURE (°C)	44
DESIGN TEMPERATURE (°C)	230
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-16)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.802
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M^3)	15.6
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-10)
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☒ YES ☐ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	11.05
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
LWN	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
SKIRT	SA 516 GR.70 / IS 2062 GR. E 250 QUALITY BR/B0
SKIRT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL) DIRECTLY WELDED OVER VESSEL	SA 516 GR.70
CLIPS & ATTACHMENTS (EXTERNAL) WELDED OVER PAD	IS 2062 GR. E 250 QUALITY BR/B0
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
LIFTING LUG	SA 516 GR.70

SPECIAL SERVICE : BENZENE/AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	7500	OPERATING	44500
HYDROTEST(SHOP)	23000	HYDROTEST (FIELD)	51500
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	03.09.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	SM/VIVEK	PB
A	29.08.2025	ISSUED FOR BIDS / ENGG.	AS	SM/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
PGH 1ST STAGE LP FLASH DRUM	पीजीएच फर्स्ट स्टेज एलपी फ्लैश ड्रम
ITEM NO. 302-VV-VW-2605	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2605

DRAWING NUMBER डाईग नम्बर	REV
B957-302-80-42-DS-3104	B
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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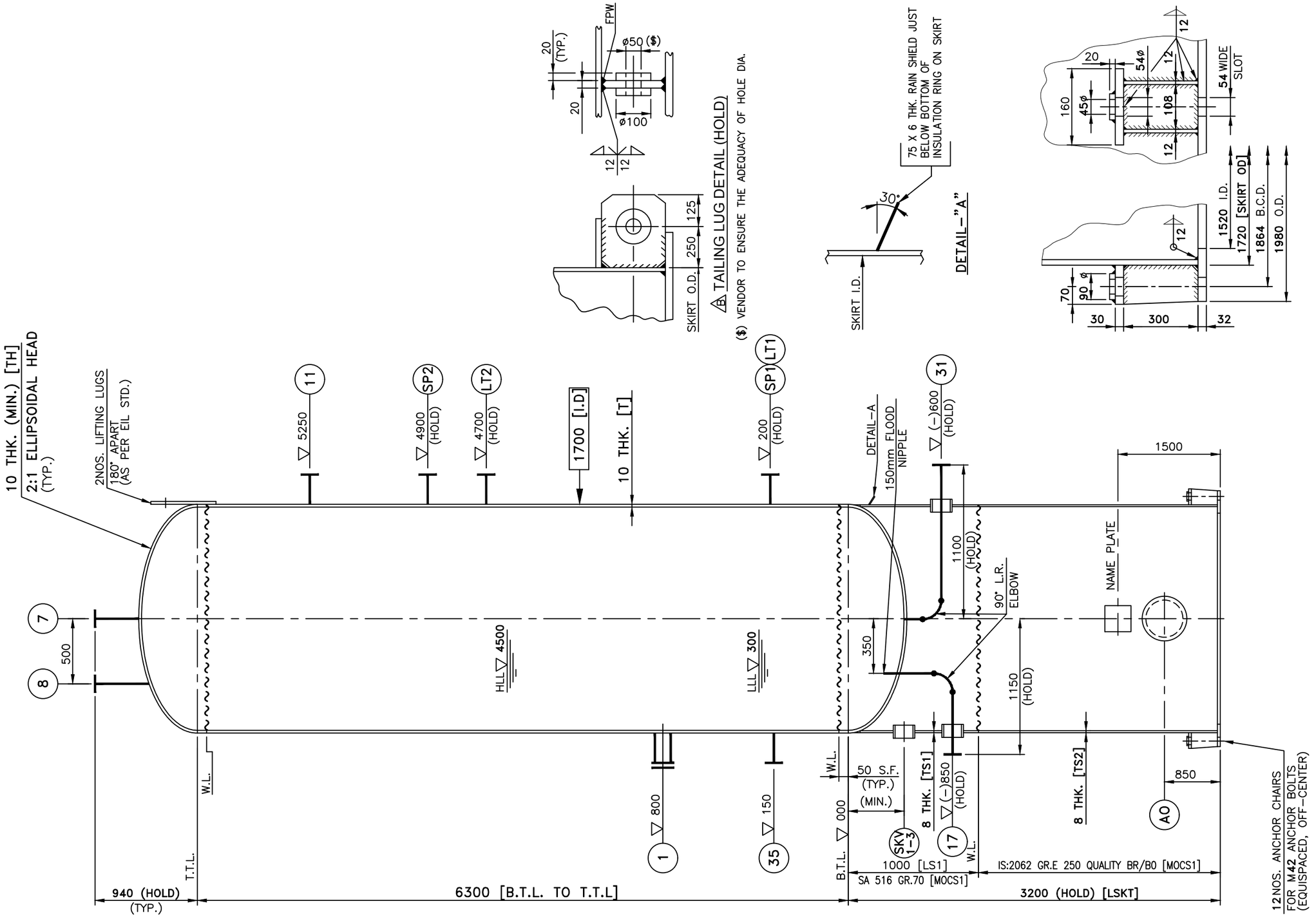

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	03.09.2025	REVISE & REISSUED FOR BIDS/ENGG.	AS	SM/VIVEK	PB	
A	29.08.2025	ISSUED FOR BIDS/ENGG.	AS	SM/VIVEK	PB	

VESSEL DESIGN DATA
PGH 1ST STAGE LP FLASH DRUM
ITEM NO. 302-VV-VW-2605

वेसेल डिजाइन डाटा
पीजीएच फर्स्ट स्टेज एलपी फ्लैश ड्रम
आइटम नम्बर 302-वीवी-वीडब्ल्यू-2605

DRAWING NO. B957-302-80-42-DS-3104
REV. B
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS: B957-302-79-41-DS-1205- REV.-1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेक्शन	पैड	सर्विस
1	1	600	14 THK.	150	WN	RF	SEE DWG.	255X T	MANHOLE + BF + DAVIT
3	1	150	80	150	WN	RF	1220	70X T	VENTILATION NOZZLE
7	1	80	160	300	WN	RF	1220	40X T	VAPOUR OUTLET TO 300-VV-VI-2002
11	1	200	80	150	WN	RF	1220	95X T	FEED FROM 302-EE-00-2605
17	1	200	80	150	WN	RF	1020	95X T	HC BOTTOM OUTLET TO 302-PA-CF-2603A/B
20	1	80	160	300	WN	RF	1220	40X T	MIN FLOW RETURN FROM 302-PA-CF-2603A/B
31A	1	50	160	300	WN	RF	970	-	DRAIN
31B	1	50	160	300	WN	RF	SEE DWG.	-	DRAIN
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL GAUGE (MAG) - INT
LT 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL TRANSMITTER (GWR)-INT
LG 3-4	2	50 (H)	160	300	WN	RF	800	-	LEVEL GAUGE (MAG)
LT 3-4	2	50 (H)	160	300	WN	RF	800	-	LEVEL TRANSMITTER (GWR)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS, NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	
PIPE SUPPORT CLEATS	
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LT, LG
X	NOZZLE ELEVATIONS LT, LG		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	2.3
DESIGN PRESSURE (kg/cm²g)	INT. 5 EXT. --
WORKING TEMPERATURE (°C)	40
DESIGN TEMPERATURE (°C)	65
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE/SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.656
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	10.77
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	6.5
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	IS 2062 GR.E250 QUALITY BR/BO
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60/ IS 2062 GR. E 250 QUALITY BR/BO WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

SPECIAL SERVICE : --

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	5500	OPERATING	13600
HYDROTEST(SHOP)	16700	HYDROTEST (FIELD)	18200
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	01.09.2025	ISSUED FOR BIDS / ENGG.	AS	SM/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
DEPENTANIZER REFLUX DRUM	डीपेंटेनाइजर रिफ्लक्र्स ड्रम
ITEM NO. 302-VV-HW-2606	आइटम नम्बर 302-वीवी-एचडब्ल्यू-2606

DRAWING NUMBER डाईग नम्बर	REV
B957-302-80-42-DS-3105	A
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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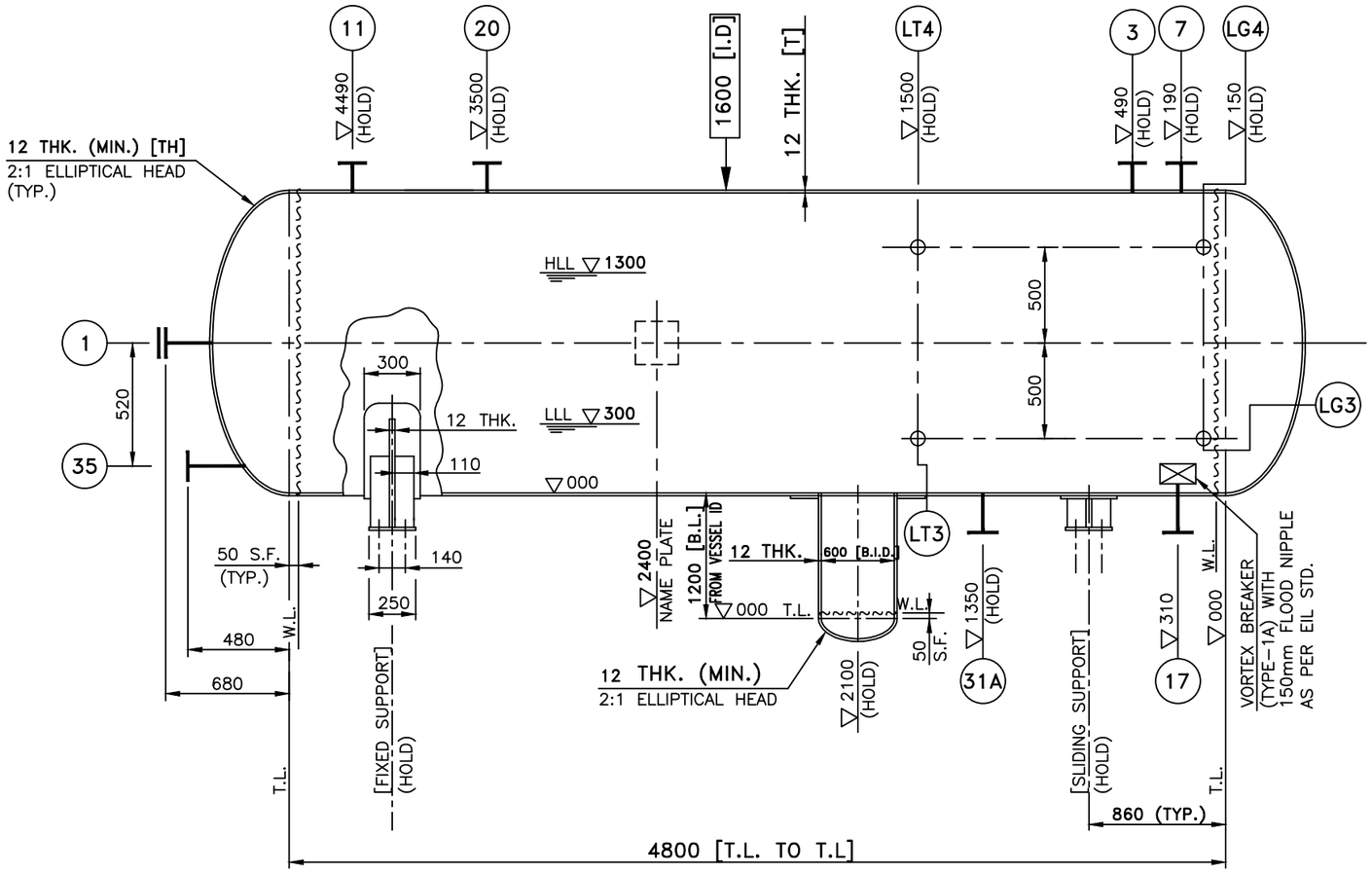
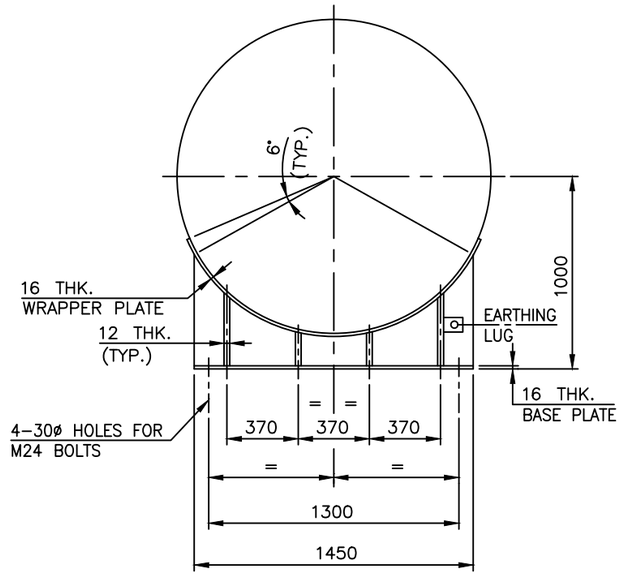
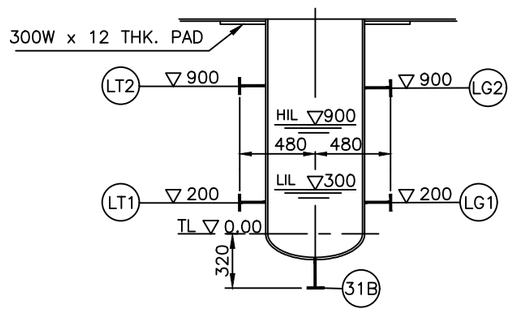




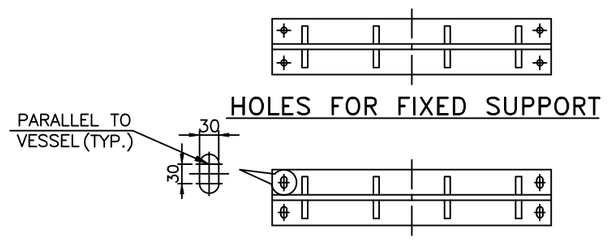
END VIEW

(NOZZLES NOT SHOWN)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



BOOT DETAIL



HOLES FOR FIXED SUPPORT

HOLES FOR SLIDING SUPPORT

A	03.09.2025	ISSUED FOR BIDS/ENGG.	AS	SM/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
DEPENTANIZER REFLUX DRUM
ITEM NO. 302-VV-HW-2606

वेसेल डिजाइन डाटा
डीपेंटेनाइजर रिफ्लक्र्स ड्रम
आइटम नम्बर 302-वीवी-एचडब्ल्यू-2606

DRAWING NO. B957-302-80-42-DS-3105
REV. A
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
5 A-B	2	200	80	300	WN	RF	570	110X T	HANDHOLE + BF + GASKET + BOLTING
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	150	80	300	WN	RF	570	85X T	FEED FROM 302-EE-00-2604
17	1	150	80	300	WN	RF	SEE DWG.	85X T	LIQUID BOTTOM OUTLET TO MP COND. HEADER
35	1	50	160	600	WN	RF	520	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	520	-	LEVEL GAUGE MAGNETIC (SS)
LT1	1	50 (H)	160	300	WN	RF	520	-	LEVEL TRANSMITTER (DP)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER IBR & MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & ALSO GET THE EQPT. INSPECTED BY CIB.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. PARTS NOT COVERED BY IBR SHALL BE DESIGNED AS PER ASME SEC. VIII DIV.1.
17. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD. TEST FOR FUSION WELDED SEAMS SHALL COMPLY WITH REQUIREMENTS OF IBR.
18. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
19. HYDROTEST SHALL BE CARRIED OUT AS PER IBR REQUIREMENTS.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
X	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LG & LT
X	NOZZLE ELEVATIONS LG & LT		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR (NOTE-16)
WORKING PRESSURE (kg/cm²g)	15
DESIGN PRESSURE (kg/cm²g)	INT. 22 EXT. F.V.
WORKING TEMPERATURE (°C)	200.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL AS PER IBR HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.864 AT OPERATING TEMPERATURE
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	0.56
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR
INSPECTION BY	[ ] EIL [X] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	IS 2062 GR. E 250 QUALITY BR/B0
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	-
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**
[ ] **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	900	OPERATING	1200
HYDROTEST(SHOP)	1500	HYDROTEST (FIELD)	1500
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	26.08.2025	ISSUED FOR BIDS / ENGG.	AS	VIVEK	PB

DESIGN DATA	डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2604	कन्डनसेट पॉट फॉर 302-ईई-00-2604
ITEM NO. 302-VV-VW-2607	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2607

DRAWING NUMBER / डाईग नम्बर: **B957-302-80-42-DS-3106** REV: A

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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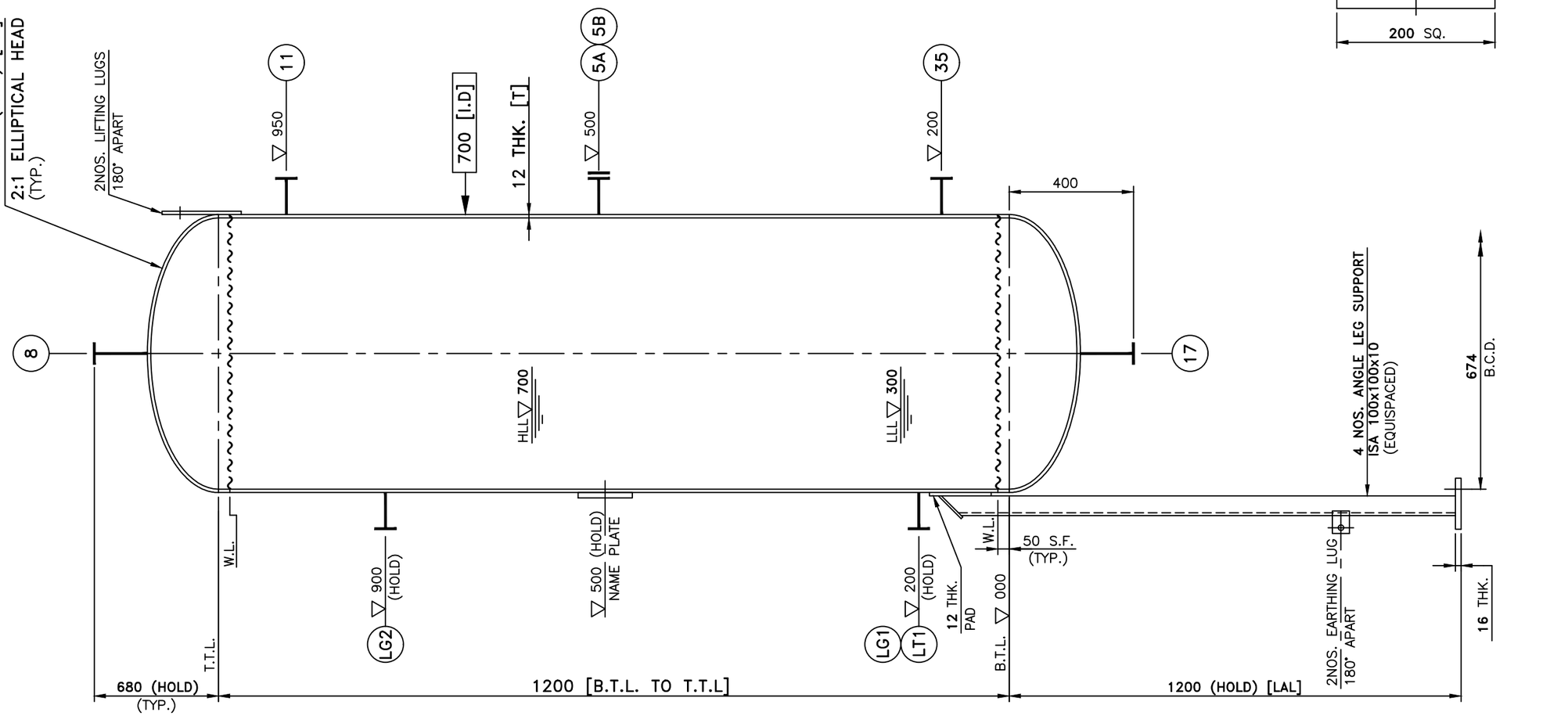

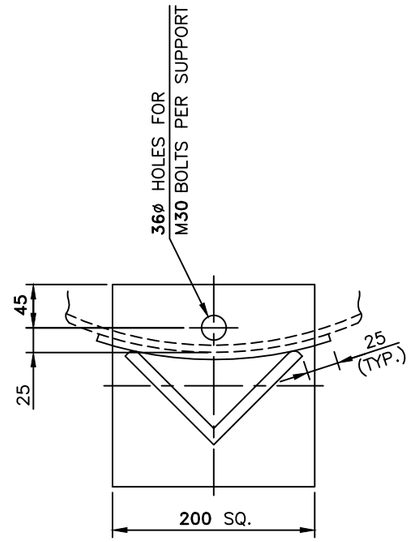

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	19.08.2025	ISSUED FOR BIDS/ENGG.	AS	VVEK	PB	

VESSEL DESIGN DATA	वेसल डिजाइन डाटा	DRAWING NO.	REV.
CONDENSATE POT FOR 302-EE-00-2604	कन्डनसेट पॉट फॉर 302-ईई-00-2604	B957-302-80-42-DS-3106	A
ITEM NO. 302-VV-VW-2607	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2607	SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS: B957-302-79-41-DS-1207 REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेक्शन	पैड	सर्विस
1	1	600	14 THK.	150	WN	RF	SEE DWG.	300X T	MANHOLE + BF + DAVIT
3	1	100	120	300	WN	RF	SEE DWG.	60X T	VAPOR OUTLET TO 302-LZ-00-2605
4	1	200	80	150	WN	RF	1720	110X T	VENTILATION NOZZLE
7	1	300 (H)	14 THK	150	WN	RF	1720	160X T	VAPOR OUTLET TO 302-EE-00-2609
11	1	250	80	150	WN	RF	1720	135 T	FEED FROM 302-EE-00-2608A/B
17	1	200	80	150	WN	RF	1520	110X T	HC LIQUID OUTLET TO 302-PA-CF-2605A/B
18	1	250	80	150	WN	RF	1520	135X T	HC LIQUID OUTLET TO 302-PA-CF-2604A/B
22	1	100	120	300	WN	RF	1720	60X T	PUMP MIN. FLOW RETURN FROM 302-PA-CF-2605A/B
24	1	100	120	300	WN	RF	1720	60X T	PUMP MIN. FLOW RETURN FROM 302-PA-CF-2604A/B
31	1	80	160	300	WN	RF	1520	45X T	DRAIN
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	1070	-	LEVEL GAUGE MAGNETIC (SS)
LT 1-2	2	50 (H)	160	300	WN	RF	1070	-	LEVEL TRANSMITTER (DP)
60	1	775 I.D.(H)	REFER DETAIL ON SHEET-2					390 X T	NOZZLE FOR EXCHANGER 302-EE-00-2609

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
11. ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
12. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
13. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
14. FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
15. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE FULLY RADIOGRAPHED.
16. EQUIPMENT SHALL BE SUBJECT TO STEAM OUT AT 0.5 Kg/cm2(g) @190°C.
17. FLANGE OF NOZZLE -60 SHALL BE AS PER DETAIL GIVEN IN SHEET-2, FLANGE GASKET & BOLTING SHALL BE SUPPLIED BY OTHERS. FLANGE FACE SHALL BE PARALLEL TO TRUE HORIZONTAL PLANE WITHOUT ANY TOLERANCE. NOZZLE-60 SHALL BE STIFFENED WITH 10 THK X 100 WIDE FLATS BETWEEN ALTERNATES BOLT HOLES EQUISPACED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	
PIPE SUPPORT CLEATS	
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES 7, LT & LG
X	NOZZLE ELEVATIONS 7, LT & LG	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	FIXED/SLIDING SUPPORT		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	-0.8
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. FV
WORKING TEMPERATURE (°C)	42
DESIGN TEMPERATURE (°C)	65
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD / CONE 1
RADIOGRAPHY	SHELL FULL HEAD / CONE FULL
POST WELD HEAT TREATMENT	YES (NOTE-23)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.838
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	46.5
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	IS 2062 GR. E 250 QUALITY BR/B0
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

@ EXCLUDING EXCHANGER WEIGHT

SPECIAL SERVICE : BENZENE/AROMATIC SERVICE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	17800 @	OPERATING	61000 @
HYDROTEST(SHOP)	69000	HYDROTEST (FIELD)	77500 @
NUMBER OF ITEMS :	ONE		

A	28.08.2025	ISSUED FOR BIDS / ENGG.	AS	SM/VIVEK	PB		
REV	DATE	REVISION	BY	CHECKED	APPROVED		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
RERUN TOWER REFLUX DRUM	रिरन टॉवर रिफलक्स ड्रम	B957-302-80-42-DS-3107	A
ITEM NO. 302-VV-HW-2608	आइटम नम्बर 302-वीवी-एचडब्लू-2608	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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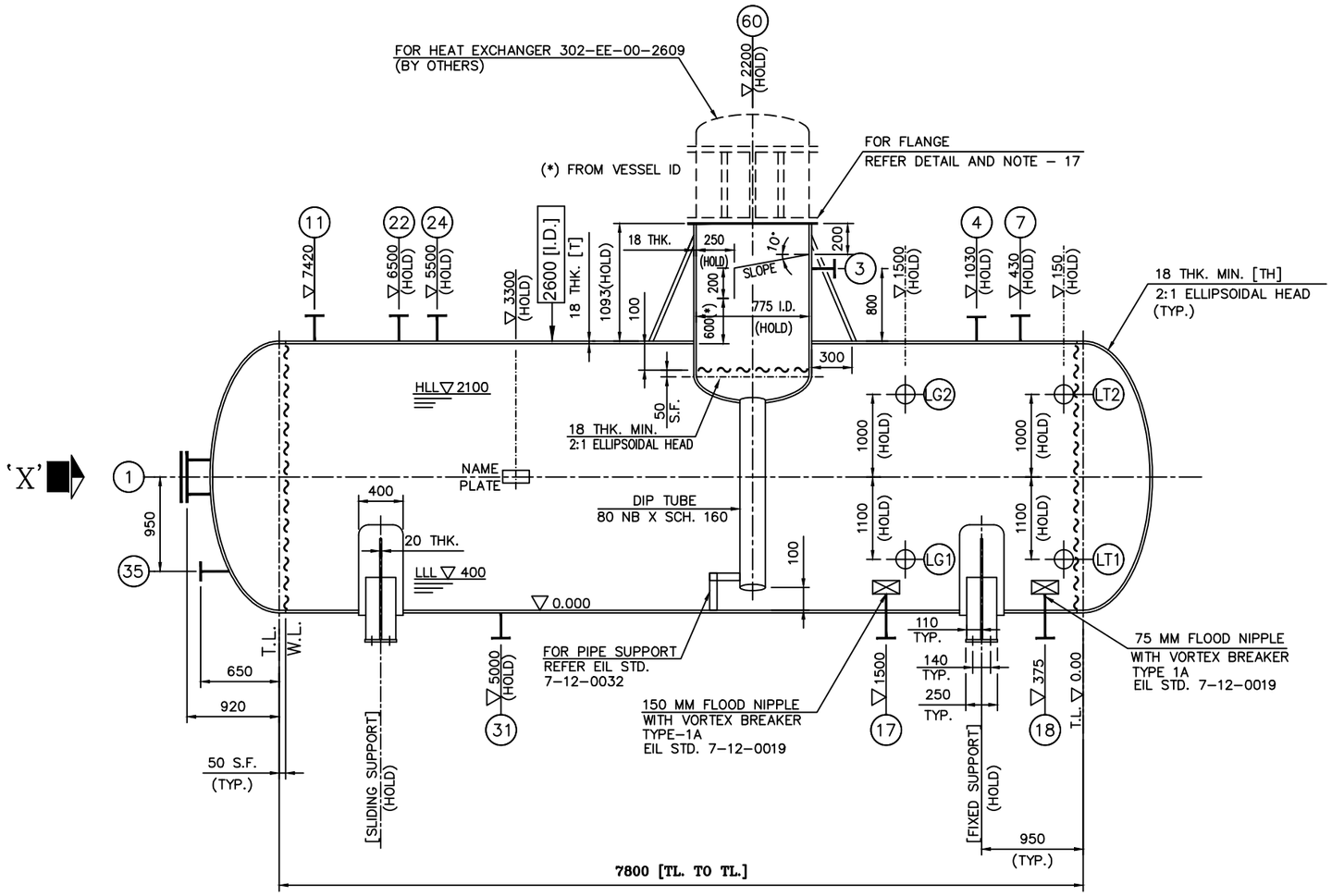
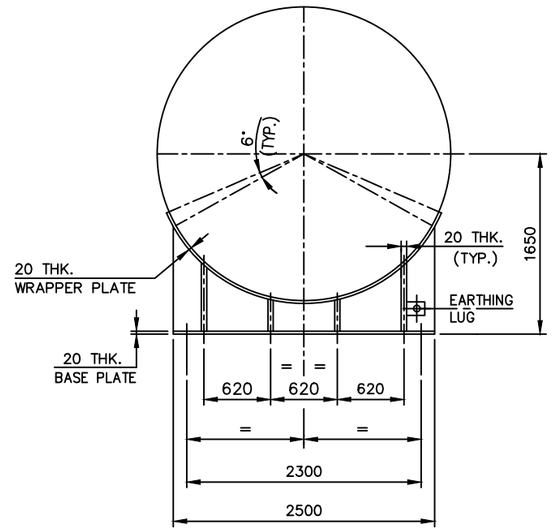
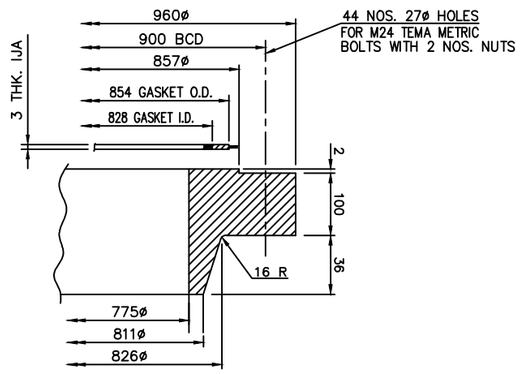


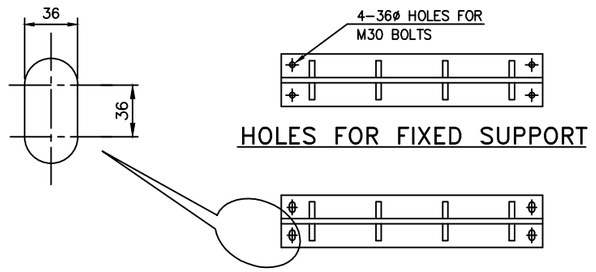


VIEW–'X'

(ALL NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



DETAIL OF NOZZLE 60 FLANGE (HOLD)



HOLES FOR FIXED SUPPORT

HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	28.08.2025	ISSUED FOR BIDS/ENGG.	AS	SM/VIVEK	PB	

VESSEL DESIGN DATA
RERUN TOWER
REFLUX DRUM
ITEM NO. 302-VV-HW-2608

वेसेल डिजाइन डाटा
रिरन टॉवर
रिफलक्स ड्रम
आइटम नम्बर 302-वीवी-एचडब्लू-2608

DRAWING NO.	REV.
B957-302-80-42-DS-3107	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
5 A-B	2	200	80	300	WN	RF	570	110X T	HANDHOLE + BF + GASKET + BOLTING
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	150	80	300	WN	RF	570	85X T	FEED FROM 302-EE-00-2607
17	1	150	80	300	WN	RF	SEE DWG.	85X T	LIQUID BOTTOM OUTLET TO MP COND. HEADER
35	1	50	160	600	WN	RF	520	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	520	-	LEVEL GAUGE MAGNETIC (SS)
LT 1-2	2	50 (H)	160	300	WN	RF	520	-	LEVEL TRANSMITTER (GWR)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER IBR & MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & ALSO GET THE EQPT. INSPECTED BY CIB.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. PARTS NOT COVERED BY IBR SHALL BE DESIGNED AS PER ASME SEC. VIII DIV.1.
17. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD. TEST FOR FUSION WELDED SEAMS SHALL COMPLY WITH REQUIREMENTS OF IBR.
18. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
19. HYDROTEST SHALL BE CARRIED OUT AS PER IBR REQUIREMENTS.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
X	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LG & LT
X	NOZZLE ELEVATIONS LG & LT		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR (NOTE-16)
WORKING PRESSURE (kg/cm²g)	15
DESIGN PRESSURE (kg/cm²g)	INT. 22 EXT. F.V.
WORKING TEMPERATURE (°C)	200.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL AS PER IBR HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.864 AT OPERATING TEMPERATURE
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	0.56
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR
INSPECTION BY	[ ] EIL [X] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	IS 2062 GR. E 250 QUALITY BR/B0
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	-
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**
[ ] **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	900	OPERATING	1200
HYDROTEST(SHOP)	1500	HYDROTEST (FIELD)	1500
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	29.08.2025	ISSUED FOR BIDS / ENGG.	AS	VIVEK	PB

DESIGN DATA	डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2607	कन्डनसेट पॉट फॉर 302-ईई-00-2607
ITEM NO. 302-VV-VW-2609	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2609

DRAWING NUMBER / डाईग नम्बर: **B957-302-80-42-DS-3108** REV: A

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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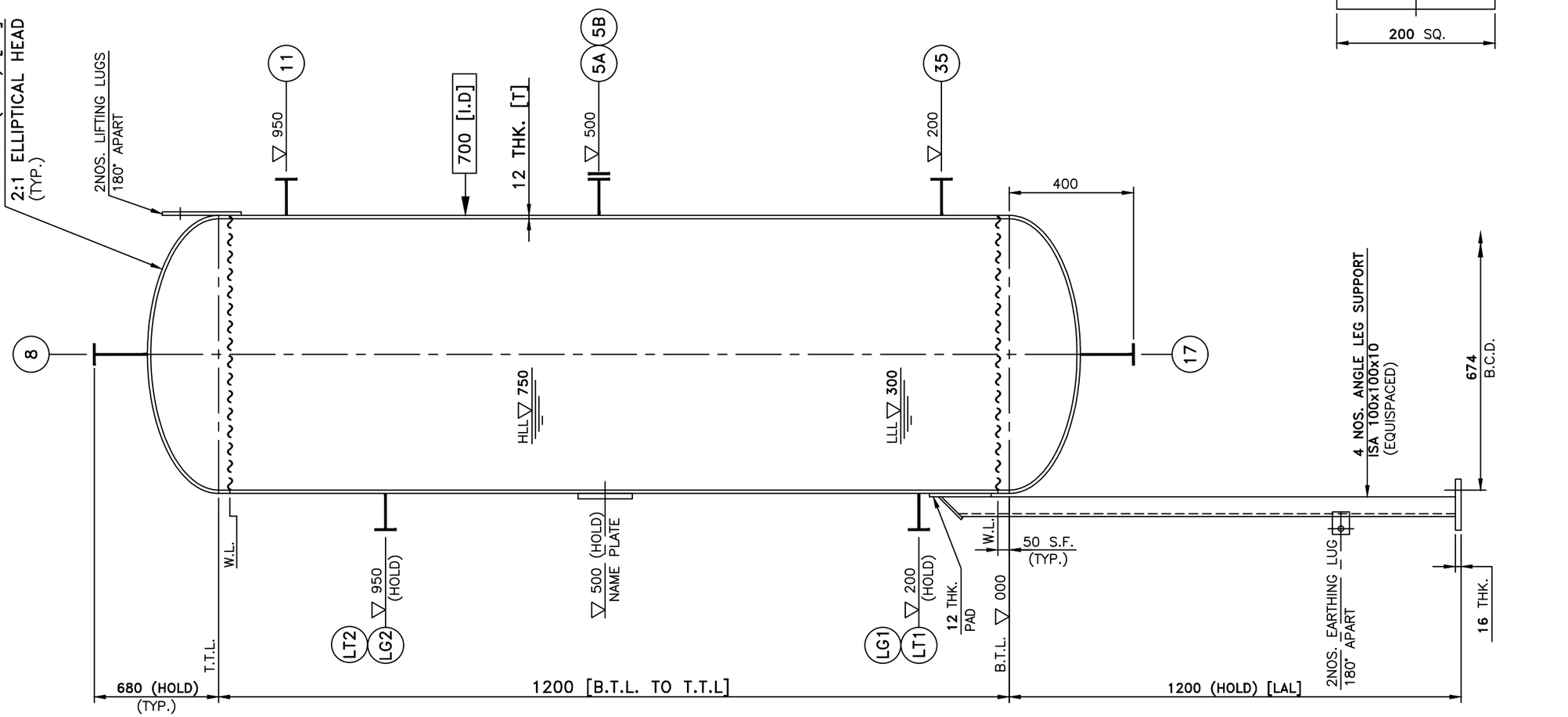

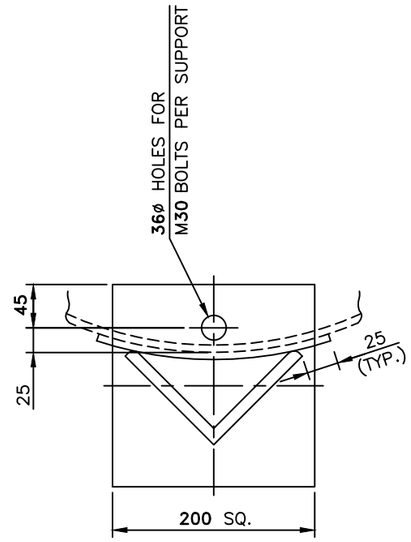

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	29.08.2025	ISSUED FOR BIDS/ENGG.	AS	VVEK	PB	

VESSEL DESIGN DATA	वेसल डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2607	कन्डनसेट पॉट फॉर 302-ईई-00-2607
ITEM NO. 302-VV-VW-2609	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2609

DRAWING NO.	REV.
B957-302-80-42-DS-3108	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS B957-302-79-41-DS-1209 REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेशन	PAD W x T पैड	SERVICE सर्विस
1	1	600	14 THK	300	WN	RF	1210	300X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
7	1	300	14 THK	300	WN	RF	SEE DWG.	160X T	VAPOUR OUTLET TO 302-VV-VI-2702, 300-VV-VI-2004
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	400	14 THK	300	WN	RF	1160	200X T	FEED FROM 302-EE-00-2703
17	1	250	80	300	WN	RF	SEE DWG.	135X T	BOTTOM OUTLET TO 302-EE-00-2704,302-PA-CF-2705 A/B
20	1	80	160	600	WN	RF	1110	45X T	MIN. FLOW RETURN FROM 302-PA-CF-2705 A/B
31	1	80	160	600	WN	RF	SEE DWG.	45X T	DRAIN
35	1	50	160	600	WN	RF	1060	-	UTILITY CONNECTION
LT 1-2	2	50 (H)	160	300	WN	RF	1060	-	LEVEL TRANSMITTER (DP)
SP 1-2	2	50 (H)	160	300	WN	RF	1060	-	STAND PIPE
AO	1	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-3	3	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	115000	8500
-	-	-
WIND	76000	6600

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
14. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
15. EQUIPMENT SHALL BE SUBJECT TO STEAM OUT AT 0.5Kg/cm2(g) @190°C.
16. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
17. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NA
	DEMISTER DATA SHEET	NA
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
X	PDS FOR VESSEL	B957-302-79-41-DS-1209

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES SP1-2, LT1-2
X	NOZZLE ELEVATIONS SP,LT,20	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV-1 2023 EDITION
WORKING PRESSURE	(kg/cm^2g)	24.9
DESIGN PRESSURE	(kg/cm^2g)	INT. 37 EXT. --
WORKING TEMPERATURE	(°C)	40
DESIGN TEMPERATURE	(°C)	185
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		YES (NOTE-16)
HEAT TREATMENT		HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		0.836
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	20
PAINTING/CLEANING		(NOTE-12)
INSULATION THICKNESS	(mm)	☐ HOT ☐ COLD
FIRE PROOFING CLEATS		☒ YES ☐ NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		48.1
INSPECTION BY		☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT/ SUPPORT~~	SA 516 GR.70/IS2062 Gr E 250 QUALITY BR/B0
~~SKIRT/ SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 Gr B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/IS 2062 GR.E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	-
VACUUM STIFFENER	-
LIFTING LUG	SA 516 GR.70
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

SPECIAL SERVICE : AROMATIC/BENZENE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	20000	OPERATING	59000
HYDROTEST(SHOP)	40000	HYDROTEST (FIELD)	67100
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	28.08.2025	ISSUED FOR BIDS / ENGG.	NS	SA/VIVEK	PB

DESIGN DATA	PGH 2ND STAGE HP FLASH DRUM
ITEM NO.	302-VV-VW-2701
डिजाइन डाटा	पीजीएच 2ण्ड स्टेज फलैश ड्रम
आइटम नम्बर	302-वीवी-वीडब्लू-2701
DRAWING NUMBER / डाईग नम्बर	**B957-302-80-42-DS-3109**
REV	A
	SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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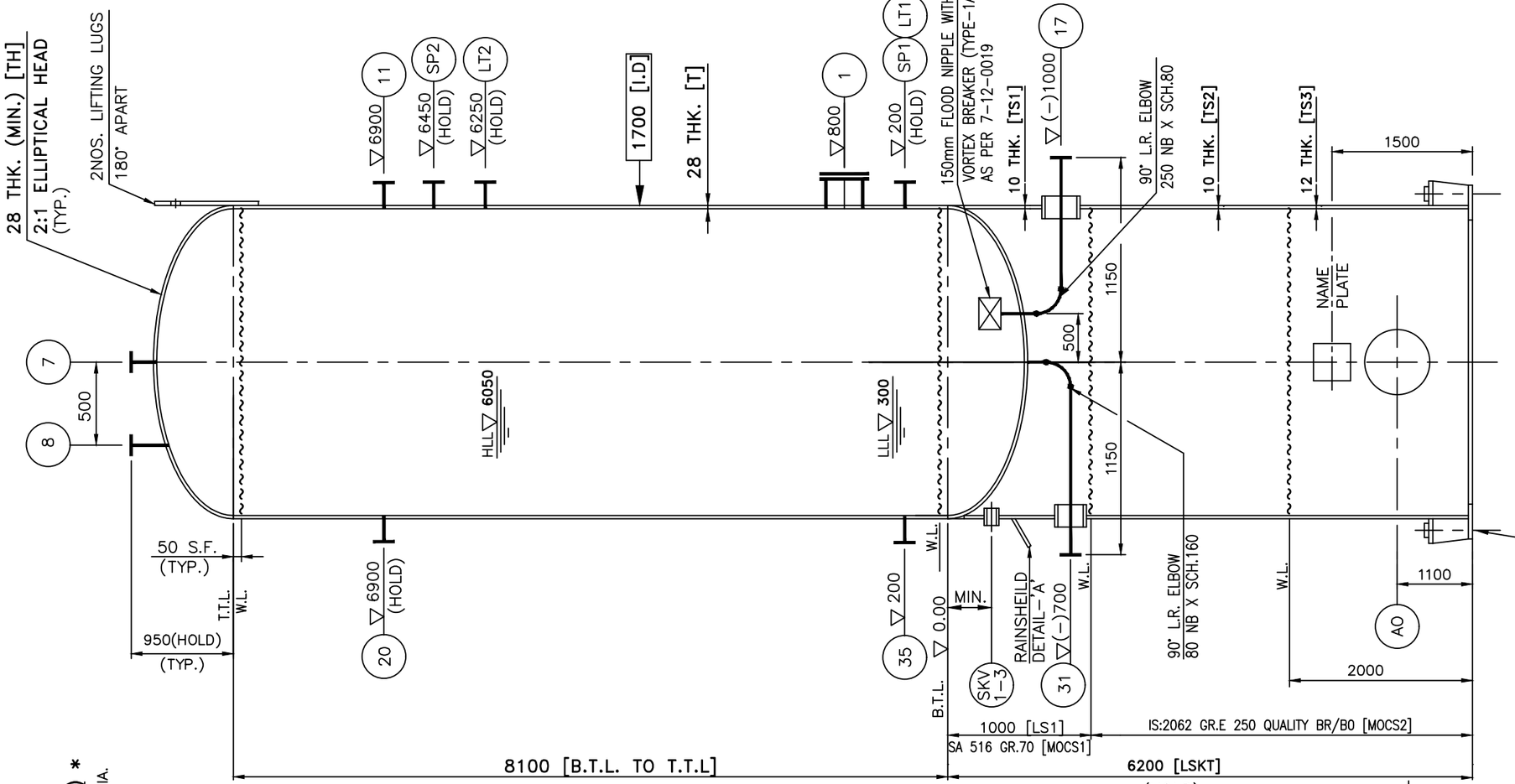
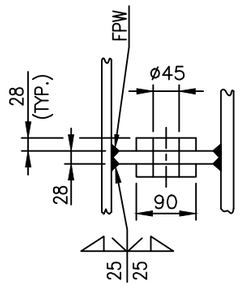
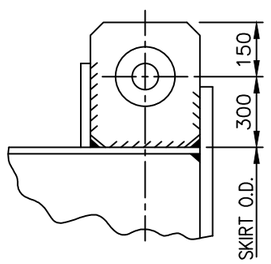
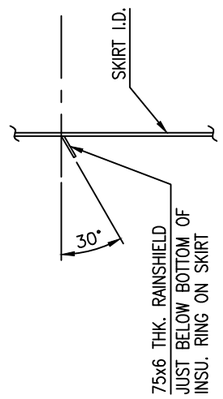




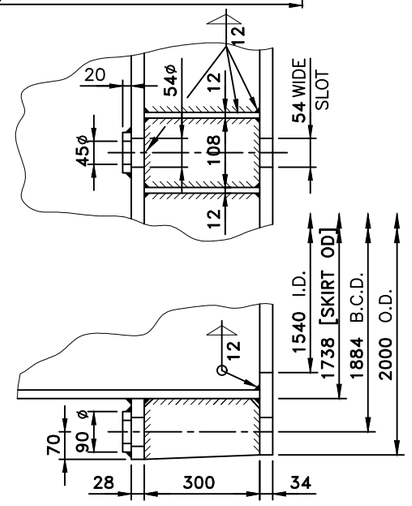
DETAIL OF TAILING LUG (HOLD) *

VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.





DETAIL-'A'



SKIRT BASE DETAIL

(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED, NEW DELHI	BHARAT PETROLEUM CORP. LTD. BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)						
	A	28.08.2025	ISSUED FOR BIDS/ENGG.	NS	SA/VIVEK	PB	
	REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

VESSEL DESIGN DATA	वेसेल डिजाइन डाटा	DRAWING NO.	REV.
PGH 2ND STAGE HP FLASH DRUM	पीजीएच 2ण्ड स्टेज एचपी फलैश ड्रम	B957-302-80-42-DS-3109	A
ITEM NO. 302-VV-VW-2701	आइटम नम्बर 302-वीवी-वीडब्लू-2701	SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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POS: B957-302-79-41-DS-1210 REV.-2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
1	1	600	26 THK.	300	WN	RF	920	200X T	MANHOLE + BF + DAVIT + GASKET + BOLTING
7	1	250	80	300	WN	RF	SEE DWG.	135xT	VAPOR OUTLET TO 302-KA-CF-2701
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	300	14 THK.	300	WN	RF	820	160xT	FEED FROM 302-VV-VW-2701
17	1	50	160	600	WN	RF	SEE DWG.	-	LIQUID BOTTOM OUTLET TO 300-CC-00-1301
31	1	50	160	600	WN	RF	SEE DWG.	-	DRAIN
35	1	50	160	600	WN	RF	770	-	UTILITY CONNECTION
36	1	50	160	300	WN	RF	770	-	PRESSURE GAUGE
LG 1-2	2	50 (H)	160	300	WN	RF	770	-	LEVEL GAUGE (MAG)
LT 1-8	8	50 (H)	160	300	WN	RF	770	-	LEVEL TRANSMITTER (DP)
AO	1	450 ID	14 THK.	AS PER EIL STD.				225 X T	ACCESS OPENING
SKV 1-3	3	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

B

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	21400	3300
WIND	18800	3200

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
11. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
12. NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKET.
13. EQUIPMENT SHALL BE STEAM OUT AT 190°C AND 0.5 kg/cm2g.
14. ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
15. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
16. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
17. VENDOR SHALL CARRY OUT SIZING OF DEMISTER AS PER PROCESS DATA FURNISHED IN PDS & SUBMIT THE SAME FOR EIL REVIEW AND SAME SHALL BE INCLUDED IN QUOTED PRICE. PERFORMANCE GUARANTEE OF DEMISTER SHALL BE BY VESSEL VENDOR. REFER EIL SPEC 6-14-0017.
18. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS / TRUNNIONS) AND BRACING ARRANGEMENT CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	GENERAL SPEC. FOR WIRE-MESH DEMISTER	6-14-0017
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
X	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
X	PROCESS DATA SHEET FOR DEMISTER	B957-302-79-41-DS-1210
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LT1-2 & LG
X	NOZZLE ELEVATIONS (LG & LT)	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 ED.2023
WORKING PRESSURE (kg/cm²g)	24.8
DESIGN PRESSURE (kg/cm²g)	INT. 37 EXT. -
WORKING TEMPERATURE (°C)	40
DESIGN TEMPERATURE (°C)	185
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-16)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.836
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M³)	5.2
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-10)
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☒ YES ☐ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	48.1
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
LWN	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT	SA 516 GR.70 / IS 2062 GR. E 250 QUALITY BR/B0
SKIRT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL) DIRECTLY WELDED OVER VESSEL	SA 516 GR.70
CLIPS & ATTACHMENTS (EXTERNAL) WELDED OVER PAD	IS 2062 GR. E 250 QUALITY BR/B0
WRAPPER PLATE	-
DEMISTER/GRID	SS 304
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
LIFTING LUG	SA 516 GR.70

SPECIAL SERVICE : BENZENE/AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	6000	OPERATING	15500
HYDROTEST(SHOP)	11200	HYDROTEST (FIELD)	18000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	18.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB
A	29.08.2025	ISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
PGH RECYCLE COMPRESSOR SUCTION DRUM	पीजीएच रीसायकल कंप्रेसर सक्शन ड्रम
ITEM NO. 302-VV-VI-2702	आइटम नम्बर 302-वीवी-वीआई-2702

DRAWING NUMBER डाईग नम्बर	REV
B957-302-80-42-DS-3110	B
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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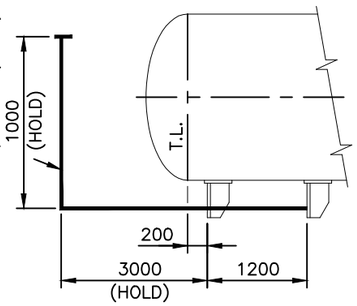
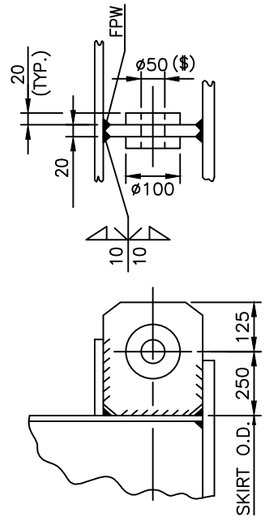


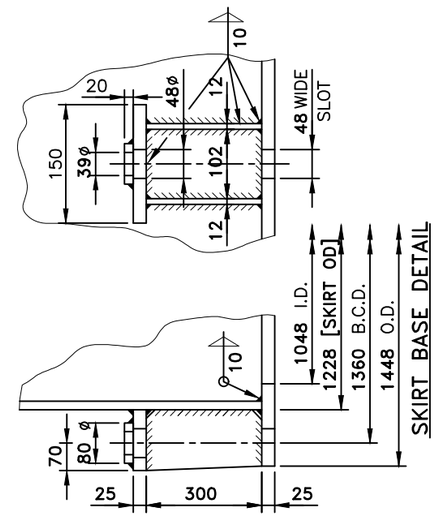
PIPE DAVIT (HOLD)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



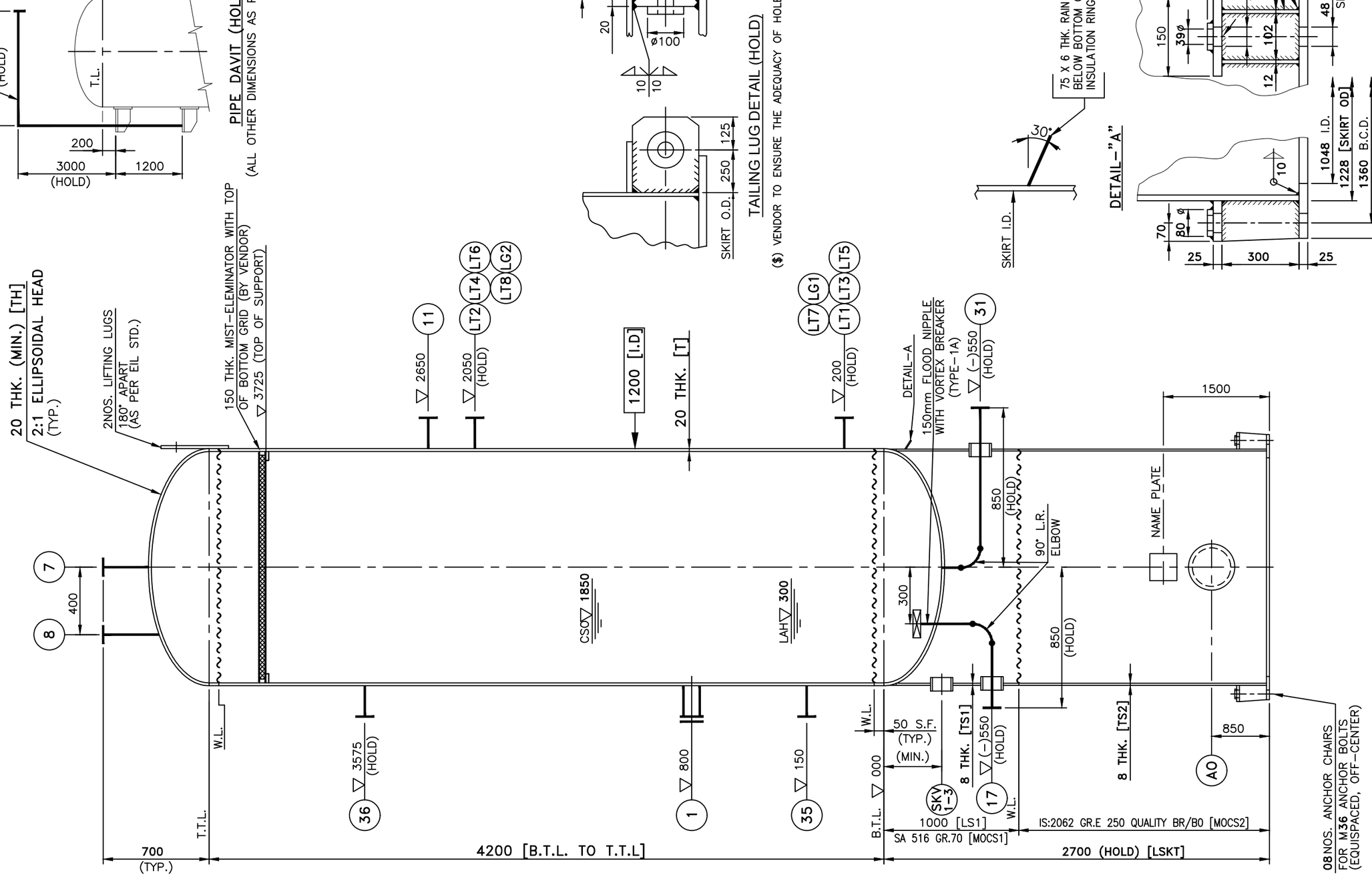
TAILING LUG DETAIL (HOLD)

($) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.



SKIRT BASE DETAIL

(ALL OTHER DIMENSIONS AS PER EIL STD.)



ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	18.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
A	29.08.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
PGH RECYCLE
COMPRESSOR SUCTION
DRUM
ITEM NO. 302–VV–VI–2702

वेसेल डिजाइन डाटा
पीजीएच रीसायकल
कंप्रेसर सक्शन ड्रम
आइटम नम्बर 302–वीवी–वीआई–2702

DRAWING NO. B957–302–80–42–DS–3110
REV. B
SHEET 2 OF 2

1–1641–0503 REV.0 A3–420x297

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PDS: B957-302-79-41-DS-1211-REV-1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
1	1	600	14 THK.	150	WN	RF	SEE DWG.	300X T	MANHOLE + BF + DAVIT
3	1	100	120	300	WN	RF	1060	60X T	VENTILATION NOZZLE
6	1	50	160	300	WN	RF	1060	-	VAPOUR OUTLET TO WET FLARE
7	1	80	160	300	WN	RF	1060	45x T	VAPOR OUTLET TO 300-VV-VI-2002
11	1	80	160	300	WN	RF	1060	45X T	FEED FROM 302-EE-00-2706
17	1	100	120	300	WN	RF	860	60X T	HC BOTTOM OUTLET TO 302-PA-CF-2701 A/B
20	1	50	160	300	WN	RF	1060	-	MIN FLOW RETURN FROM 302-PA-CF-2701A/B
31A	1	50	160	300	WN	RF	810	-	DRAIN
31B	1	50	160	300	WN	RF	SEE DWG.	-	DRAIN
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL GAUGE (MAG) - INT
LG 3-4	2	50 (H)	160	300	WN	RF	810	-	LEVEL GAUGE (MAG)
LT 1-2	2	50 (H)	160	300	WN	RF	810	-	LEVEL TRANSMITTER (GWR)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS, NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC
14. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
15. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	
PIPE SUPPORT CLEATS	
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LG, LT)
X	NOZZLE ELEVATIONS (LG, LT)	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	4
DESIGN PRESSURE (kg/cm²g)	INT. 6.5 EXT. --
WORKING TEMPERATURE (°C)	40
DESIGN TEMPERATURE (°C)	65
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-14)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.763 (AT OPERATING TEMP.)
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M³)	6
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	8.45
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.60
REINFORCEMENT PAD	SA 516 Gr.60
HEADS	SA 516 Gr.60
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.60
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	IS 2062 GR.E250 QUALITY BR/BO
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 GR.60/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.60/ IS 2062 GR. E 250 QUALITY BR/BO WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.60
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.60

SPECIAL SERVICE : BENZENE / AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	3000	OPERATING	8000
HYDROTEST(SHOP)	9000	HYDROTEST (FIELD)	9000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	01.09.2025	ISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER डाईग नम्बर	REV
H2S STRIPPER REFLUX DRUM	एच2एस स्ट्रिपर रिफ्लक्स ड्रम	B957-302-80-42-DS-3111	A
ITEM NO. 302-VV-HW-2703	आइटम नम्बर 302-वीवी-एचडब्ल्यू-2703	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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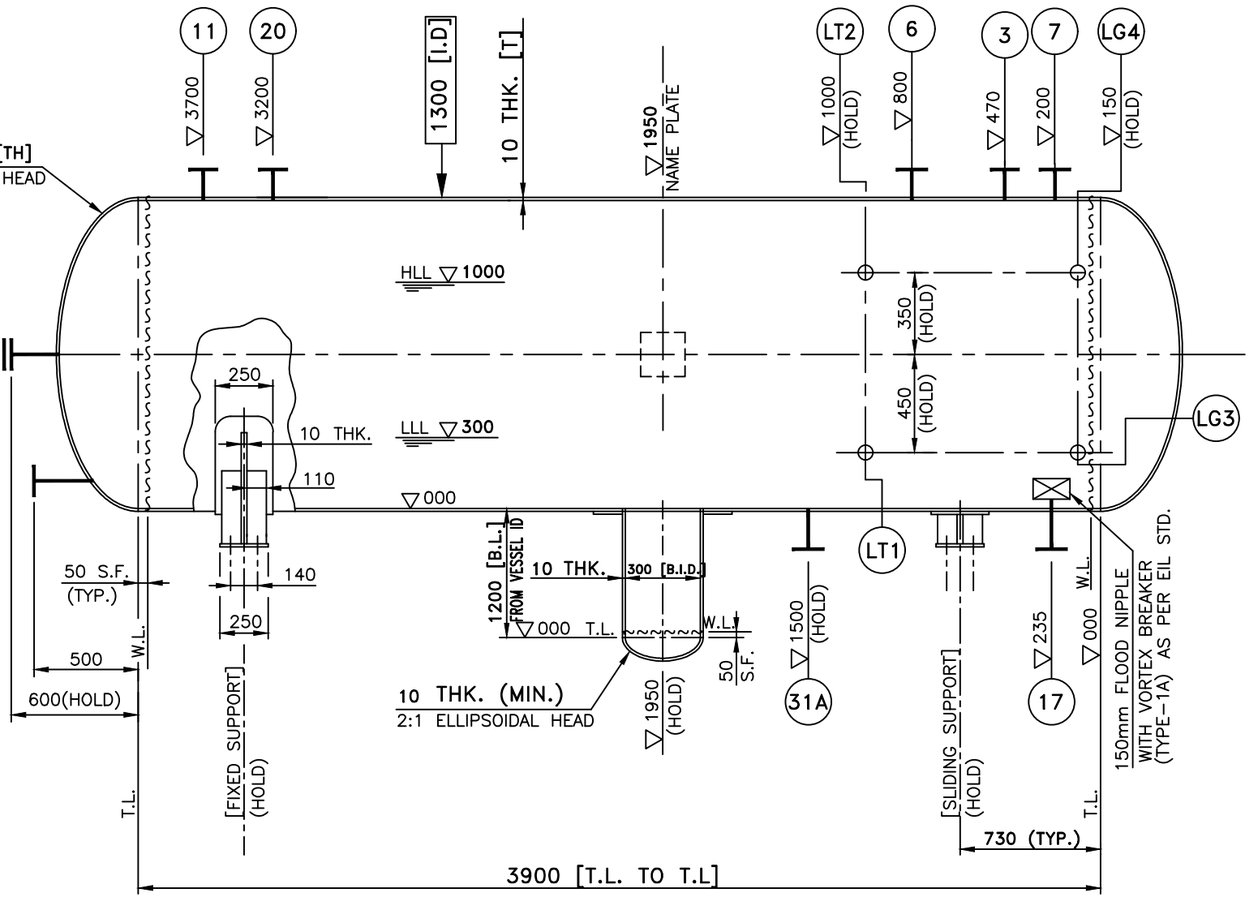
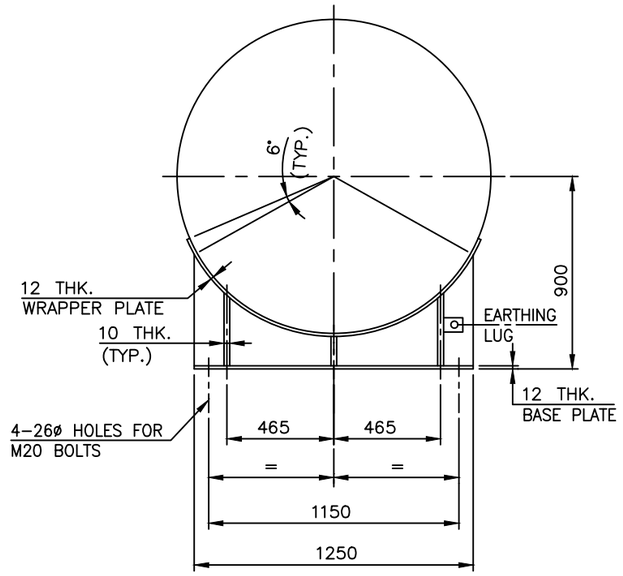
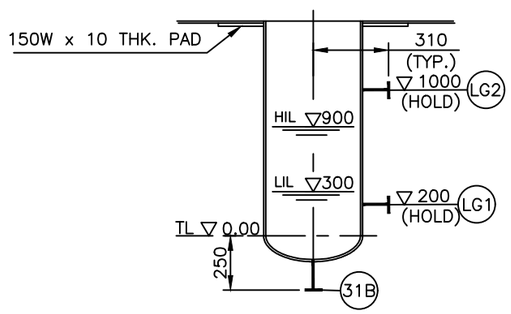




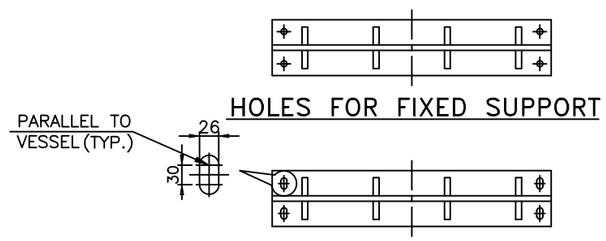
END VIEW

(NOZZLES NOT SHOWN)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



BOOT DETAIL



ENGINEERS INDIA LIMITED, NEW DELHI	BHARAT PETROLEUM CORP. LTD. BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)						
	A	01.09.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
	REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

VESSEL DESIGN DATA	वेसेल डिजाइन डाटा	DRAWING NO.	REV.
H2S STRIPPER REFLUX DRUM	एच2एस स्ट्रिपर रिफ्लक्स ड्रम	B957-302-80-42-DS-3111	A
ITEM NO. 302-VV-HW-2703	आइटम नम्बर 302-वीवी-एचडब्ल्यू-2703	SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेशन	PAD W x T पैड	SERVICE सर्विस
5 A-B	2	200	80	300	WN	RF	520	110X T	HANDHOLE + BF + GASKET + BOLTING
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	80	160	600	WN	RF	520	45X T	FEED FROM 302-EE-00-2705
17	1	80	160	600	WN	RF	SEE DWG.	45X T	LIQUID BOTTOM OUTLET TO MP COND. HEADER
35	1	50	160	600	WN	RF	470	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	470	-	LEVEL GAUGE MAGNETIC (SS)
LT1	1	50 (H)	160	300	WN	RF	470	-	LEVEL TRANSMITTER (DP)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन्स)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER IBR & MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & ALSO GET THE EQPT. INSPECTED BY CIB.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. PARTS NOT COVERED BY IBR SHALL BE DESIGNED AS PER ASME SEC. VIII DIV.1.
17. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD. TEST FOR FUSION WELDED SEAMS SHALL COMPLY WITH REQUIREMENTS OF IBR.
18. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
19. HYDROTEST SHALL BE CARRIED OUT AS PER IBR REQUIREMENTS.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
X	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LG & LT
X	NOZZLE ELEVATIONS LG & LT		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR (NOTE-16)
WORKING PRESSURE (kg/cm^2g)	16
DESIGN PRESSURE (kg/cm^2g)	INT. 22 EXT. F.V.
WORKING TEMPERATURE (°C)	203.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL AS PER IBR HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.861 (AT OPERATING TEMPERATURE)
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	0.35
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR
INSPECTION BY	[ ] EIL [X] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	IS 2062 GR. E 250 QUALITY BR/B0
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	-
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**
[ ] **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	700	OPERATING	1000
HYDROTEST(SHOP)	1050	HYDROTEST (FIELD)	1050
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	26.08.2025	ISSUED FOR BIDS / ENGG.	AS	VIVEK	PB

DESIGN DATA	डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2705	कन्डनसेट पॉट फॉर 302-ईई-00-2705
ITEM NO. 302-VV-VW-2704	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2704

DRAWING NUMBER / डाईग नम्बर: **B957-302-80-42-DS-3112** REV: A
SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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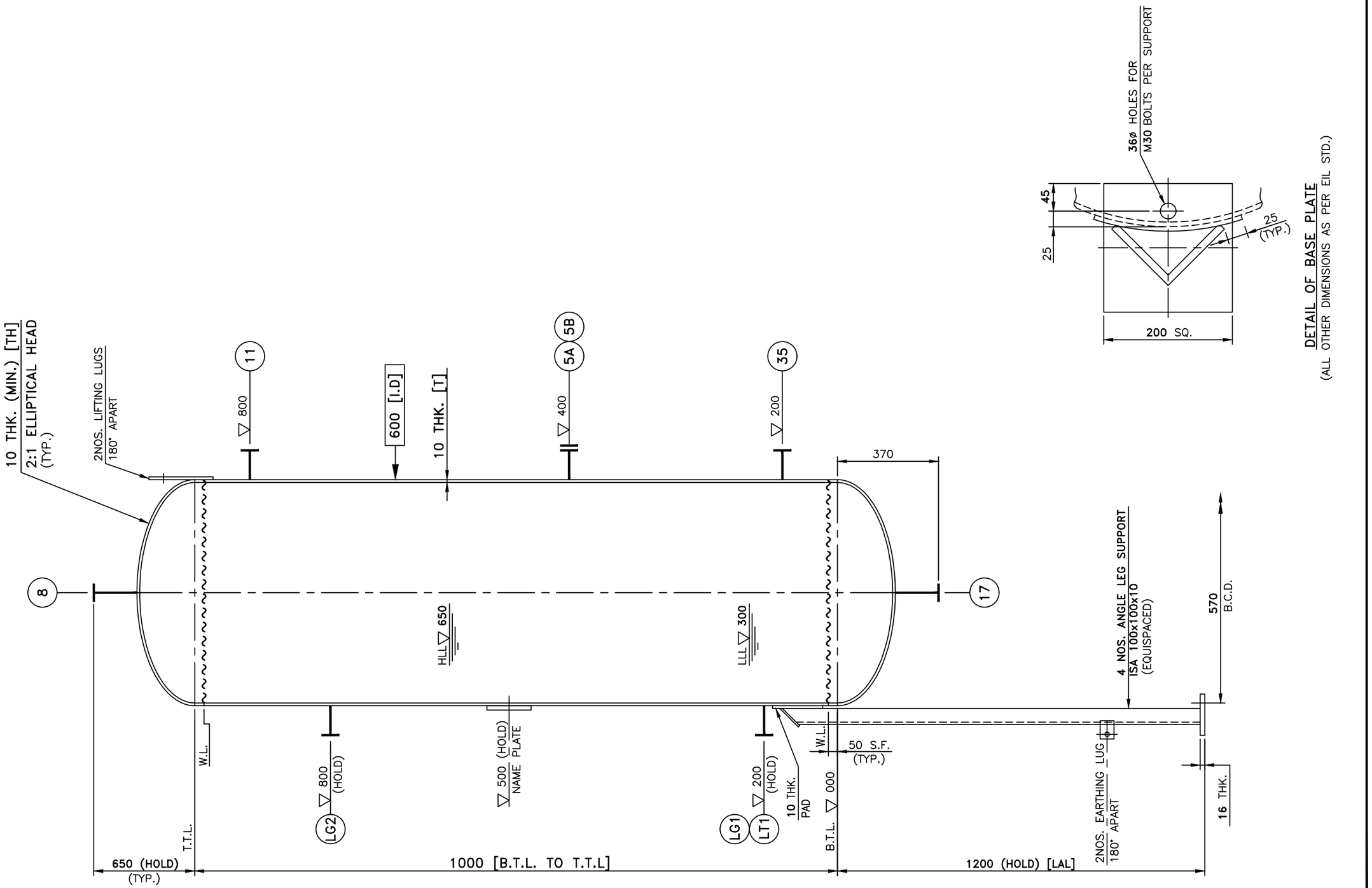

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	29.08.2025	ISSUED FOR BIDS/ENGG.	AS	VVEK	PB	

VESSEL DESIGN DATA	वेसल डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2705	कन्डनसेट पॉट फॉर 302-ईई-00-2705
ITEM NO. 302-VV-VW-2704	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2704

DRAWING NO.	REV.
B957-302-80-42-DS-3112	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेक्शन	पैड	सर्विस
1	1	600	14 THK.	150	WN	RF	SEE DWG.	300X T	MANHOLE + BF + DAVIT
4	1	150	80	150	WN	RF	1320	85X T	VENTILATION NOZZLE
7	1	80	160	300	WN	RF	1320	45X T	VAPOUR OUTLET TO 302-LZ-00-2712
11	1	250	80	150	WN	RF	1320	135X T	FEED FROM 302-EE-00-2709 A/B
17	1	250	80	150	WN	RF	1120	135X T	LIQUID OUTLET TO 302-PA-CF-2703A/B
20	1	100 (H)	120	300	WN	RF	1320	60X T	MIN FLOW RETURN FROM 302-PA-CF-2703A/B
31	1	80	160	300	WN	RF	1120	45X T	DRAIN
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	800	-	LEVEL GAUGE MAGNETIC (SS)
LT 1-2	2	50 (H)	160	300	WN	RF	800	-	LEVEL TRANSMITTER (SS)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउंडेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLE SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS, NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC
14. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
15. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LG & LT)
X	NOZZLE ELEVATIONS (LG & LT)	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	(-)0.13
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. FV
WORKING TEMPERATURE (°C)	46
DESIGN TEMPERATURE (°C)	65
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-14)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.826 (AT OPERATING TEMP)
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M³)	15.3
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)
(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	IS 2062 GR.E250 QUALITY BR/B0
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

SPECIAL SERVICE : BENZENE / AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	6500	OPERATING	19100
HYDROTEST(SHOP)	22000	HYDROTEST (FIELD)	22000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	29.08.2028	ISSUED FOR BIDS / ENGG.	AS	RR/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
BTX TOWER REFLUX DRUM	बीटीएक्स टॉवर रिफ्लक्स ड्रम
ITEM NO. 302-VV-HW-2706	आइटम नम्बर 302-वीवी-एचडब्ल्यू-2706

DRAWING NUMBER डाईग नम्बर	REV
B957-302-80-42-DS-3113	A
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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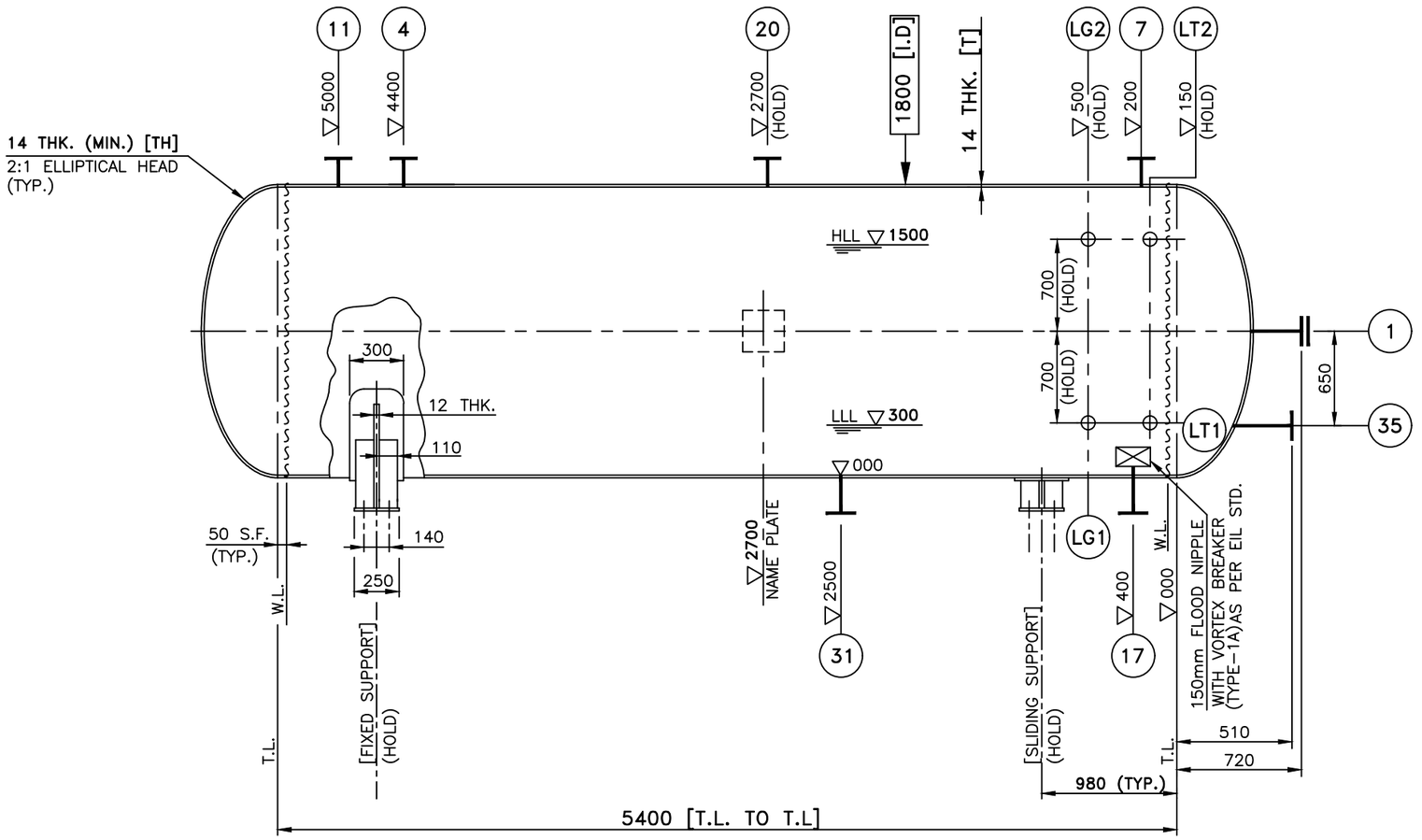
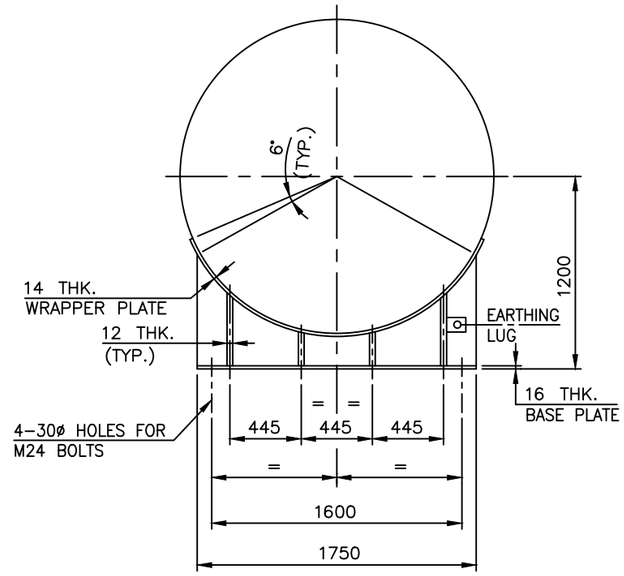
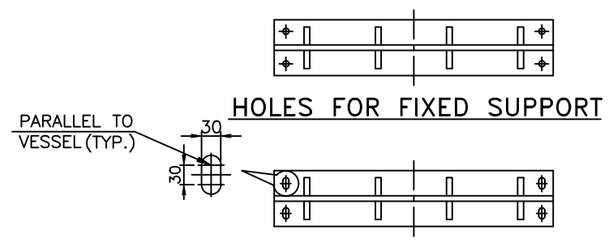




END VIEW

(NOZZLES NOT SHOWN)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



HOLES FOR FIXED SUPPORT

HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	29.08.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
BTX TOWER
REFLUX DRUM
ITEM NO. 302-VV-HW-2706

वेसेल डिजाइन डाटा
बीटीएक्स टॉवर
रिफ्लक्स ड्रम
आइटम नम्बर 302-वीवी-एचडब्ल्यू-2706

DRAWING NO. B957-302-80-42-DS-3113 | REV. A

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
5 A-B	2	200	80	300	WN	RF	570	110X T	HANDHOLE + BF + GASKET + BOLTING
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	150	80	300	WN	RF	570	85X T	FEED FROM 302-EE-00-2708
17	1	150	80	300	WN	RF	SEE DWG.	85X T	LIQUID BOTTOM OUTLET TO MP COND. HEADER
35	1	50	160	600	WN	RF	520	-	UTILITY CONNECTION
LG 1-2	2	50 (H)	160	300	WN	RF	520	-	LEVEL GAUGE MAGNETIC (SS)
LT1	1	50 (H)	160	300	WN	RF	520	-	LEVEL TRANSMITTER (DP)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER IBR & MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & ALSO GET THE EQPT. INSPECTED BY CIB.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. PARTS NOT COVERED BY IBR SHALL BE DESIGNED AS PER ASME SEC. VIII DIV.1.
17. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD. TEST FOR FUSION WELDED SEAMS SHALL COMPLY WITH REQUIREMENTS OF IBR.
18. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
19. HYDROTEST SHALL BE CARRIED OUT AS PER IBR REQUIREMENTS.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
X	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES LG & LT
X	NOZZLE ELEVATIONS LG & LT		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR (NOTE-16)
WORKING PRESSURE (kg/cm^2g)	16
DESIGN PRESSURE (kg/cm^2g)	INT. 22 EXT. F.V.
WORKING TEMPERATURE (°C)	203.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL AS PER IBR HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.861 AT OPERATING TEMPERATURE
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	0.6
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR
INSPECTION BY	[ ] EIL [X] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)
(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	IS 2062 GR. E 250 QUALITY BR/B0
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	-
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**
[ ] **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	950	OPERATING	1250
HYDROTEST(SHOP)	1550	HYDROTEST (FIELD)	1550
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	29.08.2025	ISSUED FOR BIDS / ENGG.	AS	VIVEK	PB

DESIGN DATA	डिजाइन डाटा
CONDENSATE POT FOR 302-EE-00-2708	कन्डनसेट पॉट फॉर 302-ईई-00-2708
ITEM NO. 302-VV-VW-2708	आइटम नम्बर 302-वीवी-वीडब्ल्यू-2708

DRAWING NUMBER डाईग नम्बर: **B957-302-80-42-DS-3114** REV: A

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 [28.02.2024] A3-420 X 297

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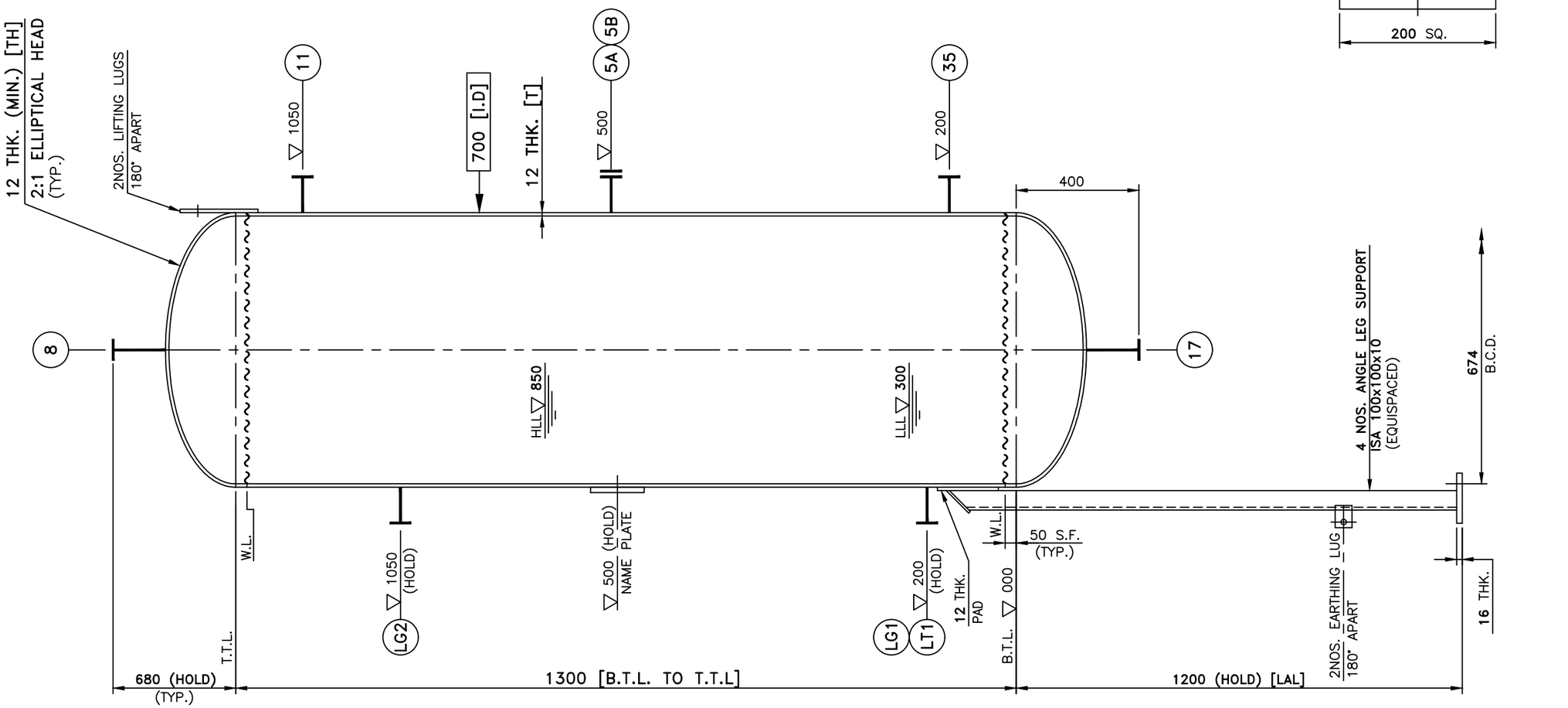

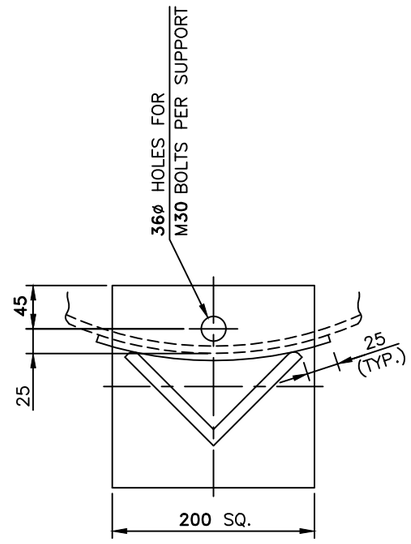

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	29.08.2025	ISSUED FOR BIDS/ENGG.	AS	VVEK	PB	

VESSEL DESIGN DATA
CONDENSATE POT FOR 302-EE-00-2708
ITEM NO. 302-VV-VW-2708

वेसल डिजाइन डाटा
कन्डनसेट पॉट फॉर 302-ईई-00-2708
आइटम नम्बर 302-वीवी-वीडब्ल्यू-2708

DRAWING NO.	REV.
B957-302-80-42-DS-3114	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेक्शन	पैड	सर्विस
1	1	600	14 THK.	150	WN	RF	SEE DWG.	200X T	MANHOLE+BF+GASKET+BOLTING+HINGE
3 A-B	2	600 (H)	14 THK.	150	WN	RF	SEE DWG.	200 X T	PUMP 300-PA-CF-2712A/B MOUNT, EXTENDED
PD A-B	2	100 (H)	BY PUMP VENDOR						PUMP DISCHARGE
7	1	80	160	300	WN	RF	SEE DWG.	-	VAPOR OUTLET TO WET FLARE
8	1	200	80	150	WN	RF	SEE DWG.	95X T	VENT
11	1	200	80	150	WN	RF	SEE DWG.	110X T	FEED FROM HC DRAIN HEADER
35	1	50	160	300	WN	RF	SEE DWG.	-	UTILITY CONNECTION
36	1	50	160	300	WN	RF	SEE DWG.	-	PRESSURE GAUGE
40	1	50	160	300	WN	RF	SEE DWG.	-	TEMPERATURE INDICATOR
LT1	1	100 (H)	160	300	WN	RF	SEE DWG.	50x T	LEVEL TRANSMITTER (GWR)
LT2	1	150 (H)	120	300	WN	RF	SEE DWG.	70x T	LEVEL TRANSMITTER (RADAR)
50	1	50	160	300	WN	RF	SEE DWG.	-	NITROGEN INLET (BLANKETING)
S1	1	450	14 THK.	150	WN	RF	SEE DWG.	170xT	MOUNTING NOZZLE + BF + GASKET + BOLTING FOR 40 & 50
S2	1	500	14 THK.	150	WN	RF	SEE DWG.	190xT	MOUNTING NOZZLE + BF + GASKET + BOLTING FOR 7, 35 & 36

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ~~ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.~~
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). ~~FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.~~
4 (B). ~~FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.~~
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES SHALL BE STIFFENED WITH 4 NOS. 100 x 10 THK FLATS AT 90 DEG.APART. MANHOLE,PUMP NOZZLE AND MOUNTING NOZZLES SHALL BE STIFFENED WITH 8 NOS 10THKx R.F PAD WIDE FLATS EQUISPACED.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES / REDUCING FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.EXTERNAL COATING SHALL BE AS PER TABLE 10.2 OF JOB SPECIFICATION.
13. THE VESSEL SHALL BE LOCATED IN RCC PIT AND SAND PACKED WITH VIBRO COMPRESSION WITH 100mm THK OF LEAN CONCRETE ON TOP (BY OTHERS).
14 (a). SIZE OF SUMP1-2 & NOZZLE P1-2 IS UNDER HOLD & SHALL BE AS CONFIRMED BY PUMP VENDOR.
14 (b). PUMP NOZZLE COVER / BLIND FLANGE WITH PUMP ASSEMBLY, NOZZLES PD1-2,BOLTING & GASKET SHALL BE SUPPLIED BY PUMP SUPPLIER.
15. CATHODIC PROTECTION IS BY OTHERS. HOWEVER,CLIP FOR THE SAME TO BE PROVIDED BY VENDOR.
16. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED/BOLTED CS INTERNAL SHALL BE 12mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
17. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190 ºC.
18. LIFTING LUG FOR HANDLING OF VESSEL SHALL BE DESIGNED (CONSIDERING IMPACT FACTOR 1.5) AND PROVIDED BY VENDOR. INDICATIVE DETAILS ARE FURNISHED ON SHEET-3.
19. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
20. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	STD. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC FOR HARDNESS REQUIREMENT	6-15-0091
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
X	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038
X	STILL WELL FOR LEVEL TRANSMITTER (RADAR TYPE) FOR BURIED VESSEL	7-12-0039

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	STILL WELL		PIPE DAVIT
X	SUMP DIAMETER, LENGTH		PACKING SUPPORT
X	BURIED HEIGHT		

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	0.2
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. -
WORKING TEMPERATURE (°C)	120
DESIGN TEMPERATURE (°C)	150
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-19)
HEAT TREATMENT	HEAD: AS PER CODE /SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	1
WIND SPECIFICATION	IS 875
SEISMIC	IS 1893 + SITE SPECTRA
CAPACITY (M^3)	52
PAINTING/CLEANING	REFER AS PER JOB SPEC.
INSULATION THICKNESS (mm)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL /~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	☒ EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/BOOT	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / BLIND FLANGE	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
SUPPORT	SA 516 Gr.70
SUPPORT BASE	-
INTERNAL PARTS (WELDED)	SA 516 Gr.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70
WRAPPER PLATE	SA 516 Gr.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
LIFTING LUG	SA 516 Gr.70
STIFFENER	SA 516 Gr.70
STILL WELL FOR LT2	SS304L

CATHODIC PROTECTION REQUIRED

@ WITHOUT PUMP ASSEMBLY

SPECIAL SERVICE : BENZENE/AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	23600@	OPERATING	72100@
HYDROTEST(SHOP)	75200@	HYDROTEST (FIELD)	75200@
NUMBER OF ITEMS :	ONE		

PDS B957-302-79-41-DS-1215 REV.2

A	08.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB		
REV	DATE	REVISION	BY	CHECKED	APPROVED		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
PGH AREA HC DRAIN DRUM	पीजीएच एरीआ एचसी ड्रैन ड्रम	**B957-302-80-42-DS-3115**	A
ITEM NO. 302-VV-HW-2712	आइटम नम्बर 302-वीवी-एचडब्ल्यू-2712	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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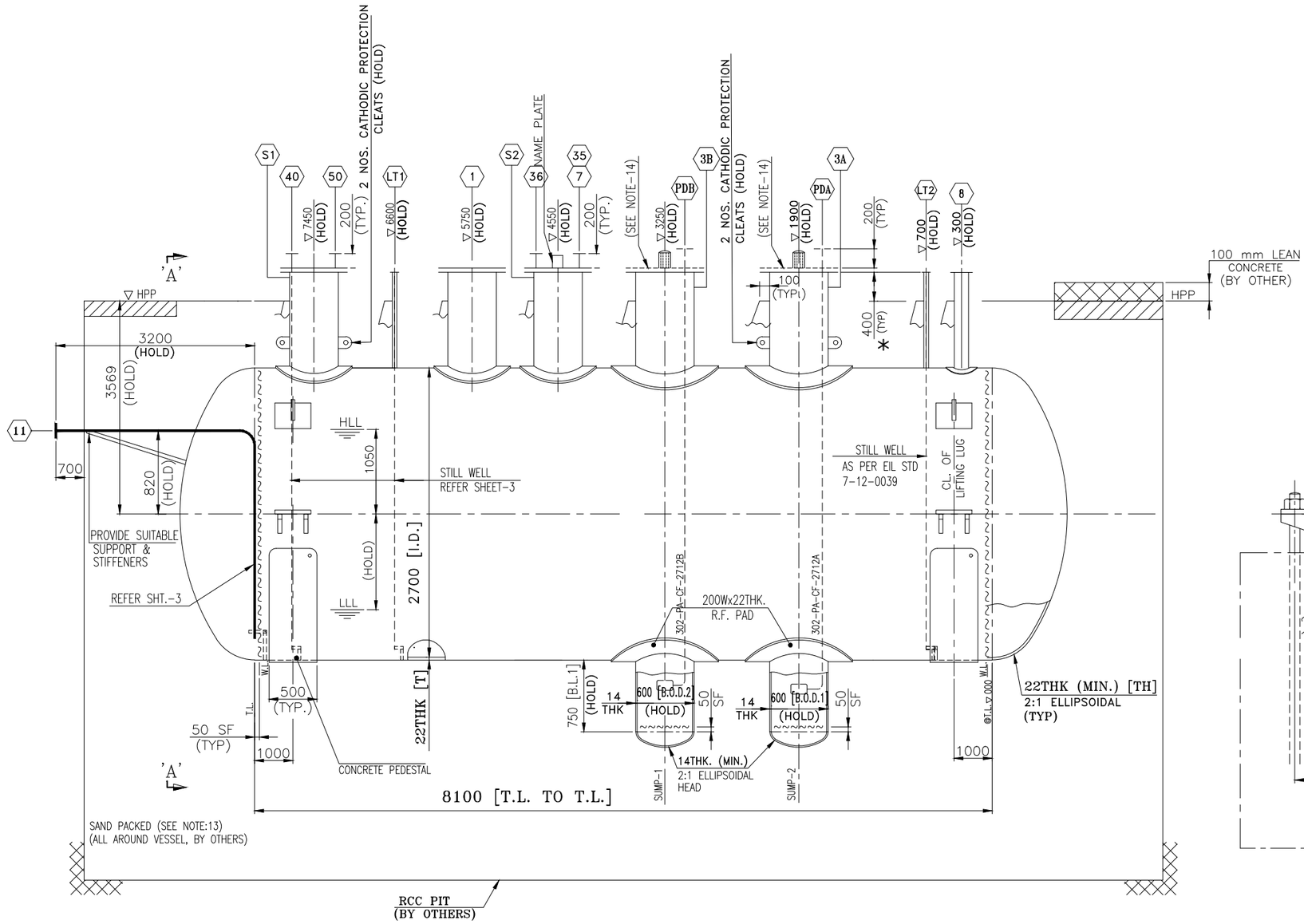
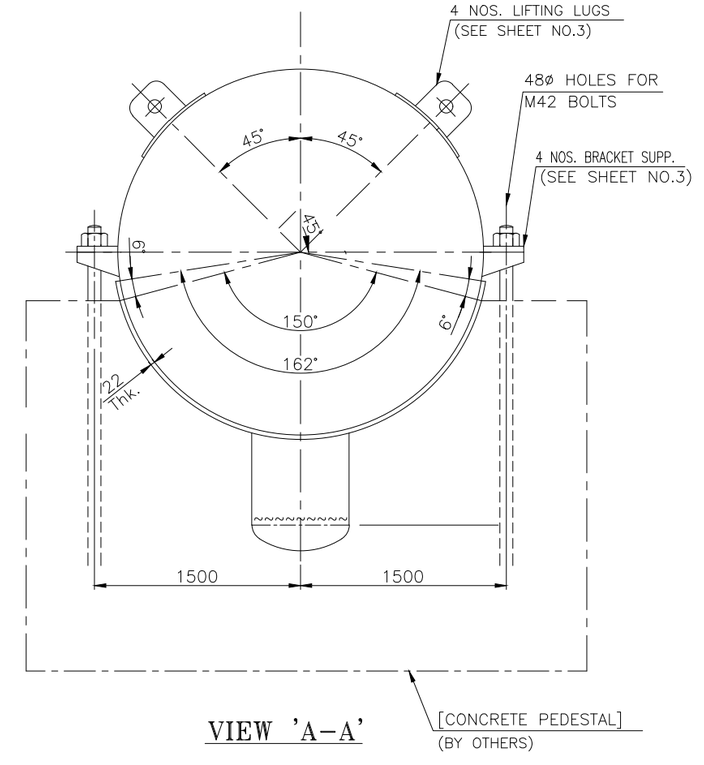
* NOZZLES MAY BE SUITABLY CUT WITH WELD EDGE PREPARATION (WITH SUITABLE COVER)FOR TRANSPORTATION. SUITABLE CUTTING ALLOWANCE IN NOZZLES SHALL BE CONSIDERED TO MAINTAIN THE GIVEN PROJECTION.FINAL ASSEMBLY OF NOZZLES AT SITE SHALL BE BY OTHERS (NOT BY VESSEL FABRICATOR)





VIEW 'A-A'

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	08.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
PGH AREA HC DRAIN DRUM
ITEM NO. 302-VV-HW-2712

वेसेल डिजाइन डाटा
पीजीएच एरीआ एचसी ड्रैन ड्रम
आइटम नम्बर 302-वीवी-एचडब्ल्यू-2712

DRAWING NO. B957-302-80-42-DS-3115
REV. A
SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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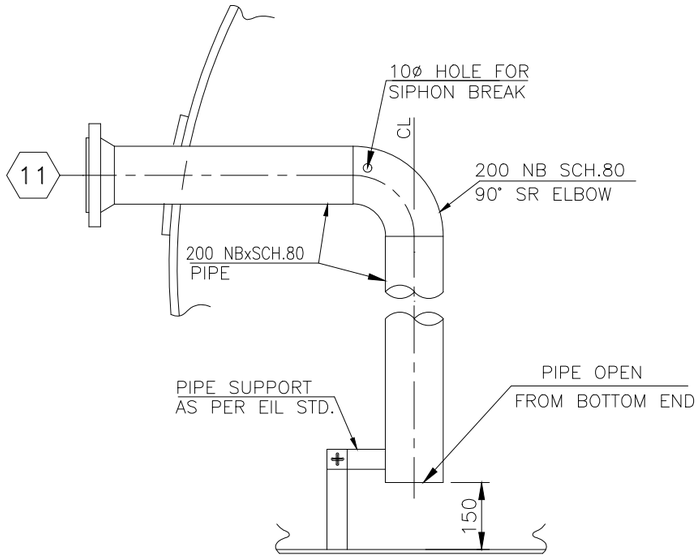
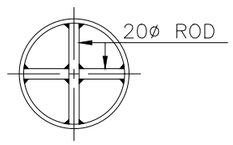
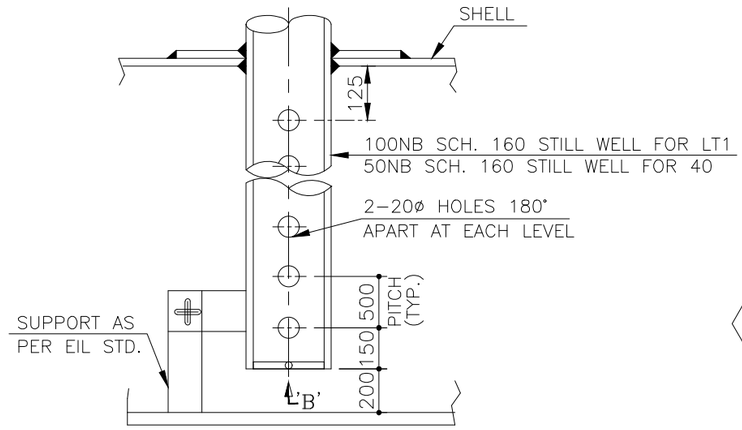


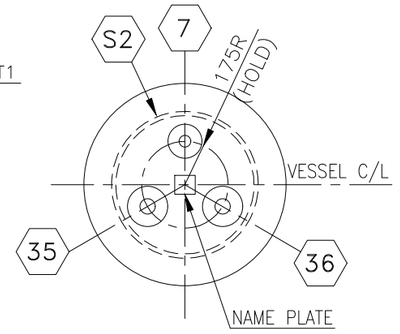
DETAIL OF NOZZLE–F



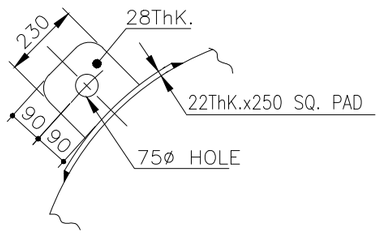
VIEW 'B'
(TYP)



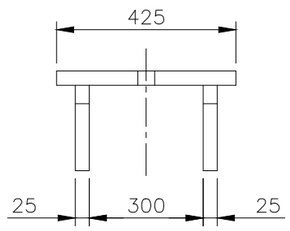
DETAIL OF STILL FOR NOZZLE LT1 & 40
(HOLD)



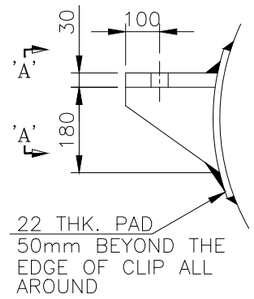
PLAN FOR
MOUNTING NOZZLE S2 (HOLD)
(FOLLOW AS PER NOZZLE ORIENTATION)



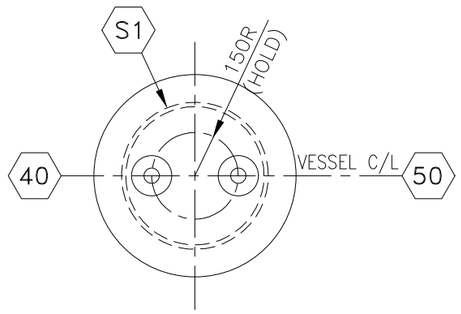
DETAIL OF LIFTING LUG (TYP)



VIEW 'A–A'



DETAIL OF BRACKET SUPPORT (TYP)



PLAN FOR
MOUNTING NOZZLE S1 (HOLD)
(FOLLOW AS PER NOZZLE ORIENTATION)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	08.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
PGH AREA HC DRAIN DRUM
ITEM NO. 302-VV-HW-2712

वेसेल डिजाइन डाटा
पीजीएच एरीअ एचसी ड्रैन ड्रम
आइटम नम्बर 302-वीवी-एचडब्ल्यू-2712

DRAWING NO.	REV.
B957-302-80-42-DS-3115	A
SHEET 3 OF 3	

1-1641-0503 REV.0 A3-420x297

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PDS REV.2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
1A-B	2	750	14 THK.	300	WN	RF	1940	380X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
2	1	600	14 THK.	300	WN	RF	1940	300X T	MANHOLE + BF + GASKET + BOLTING + DAVIT
3 A-B	2	200	80	300	WN	RF	SEE DWG.	150X T	DUMP NOZZLE (NOTE-25)
7	1	100	120	600	WN	RF	1840	60X T	VAPOR OUTLET TO 302-EE-00-2603
8	1	50	160	600	WN	RF	SEE DWG.	-	VENT
11	1	600	20 THK.	300	WN	RF	SEE DWG.	300X T	FEED FROM 300-LZ-00-3002 A/B OR REGEN GAS
12	1	500	20 THK.	300	WN	RF	1940	200X T	FEED FROM 302-PA-CF-2601A/B, 302-EE-00-2601, 302-EE-00-2602
17	1	600	20 THK.	300	WN	RF	SEE DWG.	300X T	LIQUID BOTTOM OUTLET TO 302-PA-CF-2602A/B
22	1	80	160	600	WN	RF	1840	45X T	START-UP LIQUID FROM OSBL
31	1	80	160	600	WN	RF	SEE DWG.	45X T	DRAIN
35	1	50	160	600	WN	RF	1790	-	UTILITY CONNECTION
39 A-D	4	50	160	300	WN	RF	1790	-	PRESSURE DIFFERENTIAL INDICATOR (NOTE-24)
40 A-F	6	50	160	300	WN	RF	1790	-	TEMPERATURE INDICATOR
LT 1-2	2	50(H)	160	300	WN	RF	1790	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50(H)	160	300	WN	RF	1790	-	LEVEL GAUGE MAGNETIC (SS)
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH/SKIRT END NOMINAL THICKNESS

'H' DENOTES (HOLD)

NOTES CONTINUES

28 WELD QUALITY FOR SKIRT-SHELL/HEAD JUNCTION : NDT SHALL BE CARRIED OUT AS PER TABLE 5.12 (FATIGUE STRENGTH REDUCTION FACTOR OF 1.5, QUALITY LEVEL OF 3.0) OF ASME SEC VIII DIV.2.

29 EQUIPMENT SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM TWO SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF EQUIPMENT SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). EQUIPMENT SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY REACTOR FABRICATOR.100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY REACTOR FABRICATOR. NDT & PWHT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE REACTOR AT SITE IS NOT ENVISAGED

LICENSOR'S SPECIFICATION

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊंडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	400000	20000
WIND	330000	19000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125-250 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, PRIMER & FINISH PAINT SHALL BE CARRIED OUT AT SHOP BY EQUIPMENT VENDOR AS PER PAINTING SPEC.
13 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH NEAREST MANHOLE.
14 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
15 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
16 UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED INTERNAL SHALL BE 12mm & BOLTED INTERNAL SHALL BE 10mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
17 REACTOR IS SUBJECTED TO STEAM OUT CONDITION OF 0.5 Kg/Cm^2(g) AT 190^0C.
18 COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
19 EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT.
20 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
21 ALL INTERNALS & ITS SUPPORTS (EXCEPT INERT BALLS/MEDALLION & CATALYST) SHALL BE DESIGNED AND SUPPLIED BY VENDOR.
22 OPERATING AND DESIGN CONDITION:

	OPERATING		DESIGN	
	TEMPERATURE	PRESSURE	TEMPERATURE	PRESSURE
	°C	kg/cm2g	°C	kg/cm2g
NORMAL OPERATION	SOR: 50 → 90~95 EOR:135~140 → 177	28.5	230	33
Regeneration (Oxidation)	460	1	500	3.5
Regeneration (Heating – Steam)			150	FV
Regeneration (Heating – Regen. Gas)			250	7.5

23 DENSITY AT NORMAL OPERATING CONDITIONS IS TOP: 799kg/m3 BOTTOM: 758 kg/m3.
24 ALL PRESSURE INSTRUMENTS TO BE LOCATED IN THE VAPOR SPACE.
25 BOTTOM OF NOZZLES 3A/B TO BE FLUSH WITH THE BOTTOM OF THE CATALYST BED AND ANGLED DOWN 45° FROM THE VERTICAL. PROVIDE A COVER/PLUG INSIDE THE NOZZLE FLUSH WITH THE VESSEL WALL.
26 ALL THE REACTOR INTERNALS DRAWING TO BE REVIEWED AND APPROVE BY LUMNUS TECHNOLOGY PRIOR TO REALEASE FOR FABRICATION.
27 GASKET MATERIAL MUST BE SUITABLE FOR EXPOSURE TO AROMATICS (I.E., BENZENE, TOLUENE, AND XYLENES) AT 200°C DURING LONG-TERM OPERATION AND STEAM AND/OR AIR AT 500°C DURING REGENERATION, FOR 200 HOURS PER YEAR ASSUMING TWO REGENERATION CYCLES. RECOMMENDED GASKET MATERIALS ARE FIBERGLASS AND CERAMIC. INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. & OPERATING LIQUID.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
X	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
X	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
X	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
X	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
X	PROCESS DATA SHEET	302-RB-00-2601A/B

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE (kg/cm^2g)	NOTE-22
DESIGN PRESSURE (kg/cm^2g)	INT. NOTE-22 EXT. NOTE-22
WORKING TEMPERATURE (°C)	NOTE-22
DESIGN TEMPERATURE (°C)	NOTE-22
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-18)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	NOTE-23
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	138.6
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-12)
INSULATION THICKNESS (mm) (IH)	175 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	42.9
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD/INSERT PLATE	SA 516 Gr.70
HEADS	SA 516 Gr.70
~~SHELL FLANGES/SR/LWN~~	-
NOZZLE FLANGES~~/SRWN/LWN~~	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR.B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR.WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	NOTE-27
EXTERNAL STUDS/BOLTS/NUTS	SA193 GR.B7/SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/ IS 2062GR. E 250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	SS 304L
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR/B0 WELDED OVER BQCS PAD.
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	-
LIFTING TRUNION	-
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0 /SA 516 Gr.70
SUPPORTS FOR INTERNALS	SA 516 GR.70

PIPE/PLATFORM CLEAT SHALL NOT BE SUPPORTED ON THIS EQUIPMENT

EQUIPMENT SHALL BE TRANSPORTED IN MAXIMUM TWO SECTION

SPECIAL SERVICE : BENZENE/AROMATIC/CYCLIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	92000	OPERATING	180000
HYDROTEST(SHOP)	230600	HYDROTEST (FIELD)	260000
NUMBER OF ITEMS :	TWO		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	01.12.2025	ISSUED FOR BIDS / ENGG.	AS	CRG./VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
PGH 1ST STAGE REACTOR	पीजीएच फर्स्ट स्टेज रीऐक्ट	B957-302-80-42-DS-3201	A
ITEM NO. 302-RB-00-2601A/B	आइटम नम्बर 302-आरबी-00-2601ए/बी	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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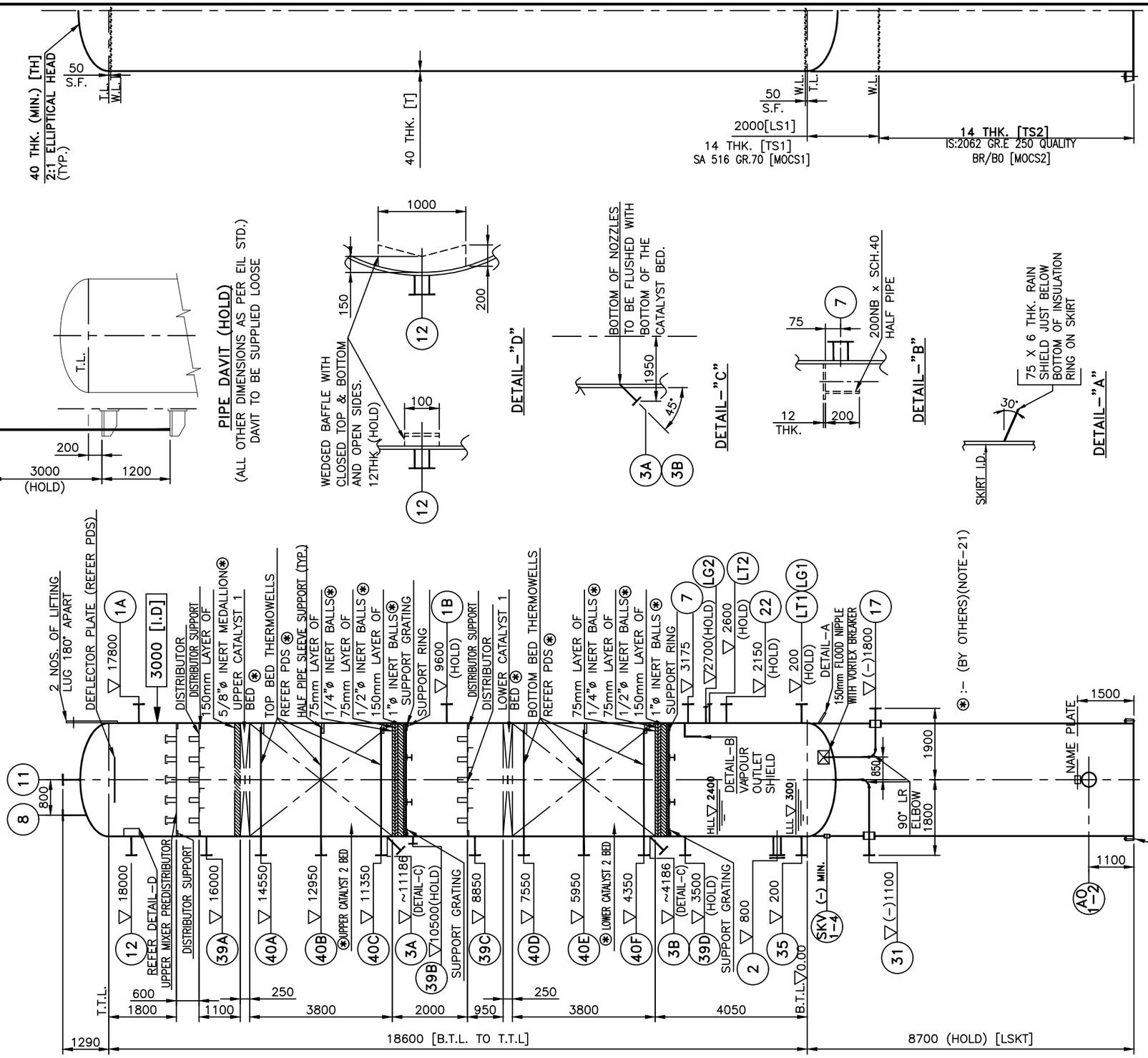

A	01.12.2025	ISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB		
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
PGH 1ST STAGE REACTOR
ITEM NO. 302-RB-00-2601A/B

वेसल डिजाइन डाटा
पीजीएच फर्स्ट स्टेज रीऐक्टर
आइटम नम्बर 302-आरबी-00-2601ए/बी

DRAWING NO.	REV.
B957–302–80–42–DS–3201	A
SHEET 2 OF 2	

1–1641–0503 REV.0 A3–420x297

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PDS REV.2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
1	1	900	#, &	600	SRWN	RF	SEE DWG.	-	MANHOLE + REDUCING FLANGE
3	1	200	#, &	600	SRWN	RF	SEE DWG.	-	DUMP NOZZLE + B.F. + PLUG (NOTE-22)
11	1	750	#, &	600	WN	RF	SEE DWG.	-	FEED FROM 302-EE-00-2702 OR REGENERATION (NOTE-19)
17	1	750	#, &	600	SRWN	RF	SEE DWG.	-	VAPOR BOTTOM OUTLET TO 302-EE-00-2701, 302-EE-00-2703
35	1	76.2 ID.	#, &	600	SRLWN	RF	#	-	UTILITY CONNECTION
40 (A-C)	3	76.2 ID.	#, &	600	SRLWN	RF	#	-	TEMPERATURE INDICATOR
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'H' DENOTES HOLD AND 'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

& 5-7mm WELDOVERLAY FOR 3mm UNDILUTED SS347 CHEMISTRY

 # REFER SHEET-3

CONTINUE NOTE:

30 FOR WELD OVERLAID FLANGES, MINIMUM THICKNESS OF FLANGES SHALL BE AS PER ASME B16.5 / B16.47 UNLESS SPECIFIED OTHERWISE. VENDOR TO CONSIDER EXTRA THICKNESS TO MEET UNDERCUT REQUIREMENT FOR WELD OVERLAY.

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) 0
फॉउंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	324000	27000
	-	-
WIND	122000	10000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125-250 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 900 APART.
10 ALL FABRICATED NOZZLES SHALL BE FULLY RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 B SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 FULL RADIOGRAPHY WHEREVER SPECIFIED SHALL IMPLY 100% RADIOGRAPHY OF ALL BUTT WELDS.
14 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
15 COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
16 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
17 OPERATING AND DESIGN CONDITIONS :

	OPERATING		DESIGN	
	TEMP.	PRESSURE	TEMP.	PRESSURE
	^{0}C	Kg/cm^{2}g	^{0}C	Kg/cm^{2}g
HYDROGENATION	SOR:230 → 270-280 EOR: 260 → 300-310	SOR:26.7 → 26.3 SOR:28.4 → 26.3	400	37.0
REGENERATION (OXIDATION)	430	1	500	3.5
REGENERATION (HEATING REGEN. GAS)	~260		250	7.5
REGENERATION (HEATING STEAM)	330-370		150	F.V
SULFIDING	315	15-35	400	3.7

18 EQUIPMENT SHALL BE SUBJECT TO STEAM OUT AT 0.5 Kg/cm2(g) @1900C.
19 VENDOR SHALL DESIGN & SUPPLY LIFTING LUG FOR COMPLETE ASSEMBLY OF NOZZLE '11' INCLUDING REDUCING FLANGE & FEED DIFFUSER. LIFTING LUG SHALL BE LOCATED AT C.G. OF COMBINED ASSEMBLY.
20 THE VESSEL SHALL BE WELD OVERLAID WITH 309Cb WITH GUARANTEED CHEMISTRY OF 347 SS IN THE TOP 3mm OF THE WELD OVERLAY.
21 ALL THE INTERNAL & ITS SUPPORTS (EXCEPT CATALYST & INERT BALLS) SHALL BE DESIGNED AND SUPPLIED BY VENDOR.
22 VENDOR SHALL ENSURE THAT BOTTOM OF NOZZLES 3 TO BE FLUSH WITH THE BOTTOM OF THE CATALYST BED AND ANGLED DOWN 45° FROM THE VERTICAL AND FINALISE THE ELEVATION ACCORDINGLY.VENDOR SHALL PROVIDE A COVER/PLUG INSIDE THE NOZZLE FLUSH WITH THE VESSEL WALL.
23 ALL SS SURFACES SHALL BE PICKLED AND PASSIVATED AS PER ASTM A 380.
24 ALL PRESSURE RETAINING WELDS SHALL BE 100% RADIOGRAPHED. THIS INCLUDE ALL BUTT WELDS IN Cr-Mo SELECTION OF SKIRT INCLUDING Cr-Mo TO CS CIRCUMFERENTIAL JOINT.
25 ALL WELD-SEAMS SHALL BE LOCATED CLEARING FOULING WITH OTHER ATTACHMENTS/NOZZLES.
26 WELD QUALITY FOR SKIRT-SHELL/HEAD JUNCTION : NDT SHALL BE CARRIED OUT AS PER TABLE 5.12 (FATIGUE STRENGTH REDUCTION FACTOR OF 2.5, QUALITY LEVEL OF 5.0) OF ASME SEC VIII DIV.2.
27 ALL PRESSURE RETAINING COMPONENTS, WELDS & HEAT AFFECTED ZONES SHALL BE IMPACT TESTED AT (-)18°C.THE AVERAGE OF THREE IMPACT TEST VALUES AT TESTING TEMPERATURE SHALL NOT BE LESS THAN 55J WITHOUT INDIVISUAL VALUE BELOW 47J.
28 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
29 EQUIPMENT MAY BE ERECTED IN DRESSED UP CONDITON (I.E AFTER INSTALLATION OF INSULATION) BY OTHERS CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES OF ACTUAL ERECTION WEIGHT.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPECIFICATION FOR PRESSURE VESSELS	6-12-0001
X	SUPPLEMENTARY REQUIREMENT FOR LOW ALLOY STEEL VESSELS	6-12-0003
X	STD. SPEC FOR CLAD VESSEL	6-12-0007
X	SUPP. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC FOR CLAD PLATES	6-12-0015
X	STANDARD SPECIFICATION FOR 1% Cr-%5%Mo AND 1%% Cr-%%Mo STEEL PLATES	6-12-0017
X	STANDARD SPEC. FOR SS PLATES	6-12-0020
X	STD. SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING.	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
X	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS (रेफरेन्स डाईंग)

X	NOZZLE ORIENTATIONS	B957-302-16-43-NZ-43202 A/B 0
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	-
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
X	PDS FOR 302-RB-00-2701 A/B	302-RB-00-2701A/B

HOLD UPS (होल्ड अप्स) 0

	NOZZLE ORIENTATIONS		SIZE OF NOZZLES -35,40
	ELEVATIONS OF NOZZLE		PIPE SUPPORT CLEATS
	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	THERMOCOUPLE SUPPORTS	X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^{2}g)	NOTE-17
DESIGN PRESSURE	(kg/cm^{2}g)	INT. NOTE-17 EXT. -
WORKING TEMPERATURE	(°C)	NOTE-17
DESIGN TEMPERATURE	(°C)	NOTE-17
MDMT	(°C)	1.1
CORROSION ALLLOWANCE	(MM)	(NOTE-20)
TYPE OF HEAD		2:1 ELLIPSOIDAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		YES (NOTE-15)
HEAT TREATMENT		AS PER CODE / SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		-
WIND SPECIFICATION		IS 875
SEISMIC		IS 1893 + SITE SPECTRA
CAPACITY	(M^3)	68.5
PAINTING/CLEANING		AS PER JOB SPEC.
INSULATION THICKNESS	(mm)	150(IH) [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		50.74
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मॉटेरियल आफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~) (NOTE-27)

SHELL/BOOT/INSERT PLATE	SA 387 GR.11 CL1 + SS 347 W.O (NOTE-20)
REINFORCEMENT PAD	-
HEADS	SA 387 GR.11 CL1 + SS 347 W.O (NOTE-20)
SHELL FLANGES/SR/LWN	SA 182 GR.F11 CL2+ SS 347 W.O (NOTE-20)
NOZZLE FLANGES	SA 182 GR.F11 CL2 + SS 347 W.O (NOTE-20)
NOZZLE NECK UPTO 250 NB	-
NOZZLE NECK ABOVE 250 NB (FOR 11 & 17)	SA 387 GR.11 CL.1 + SS 347 W.O (NOTE-20)
PIPE FITTINGS	SA 234 GR. WP11 + SS 347 W.O (NOTE-20)
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 321 METAL WINDING & GRAFOIL FILLER WITH SS 321 OUTER RING & INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B16/SA 194 GR.7
INTERNAL STUDS/BOLTS/NUTS	SS 347 / SS 321
SKIRT/ ~~SUPPORT~~	SA 387 GR.11 CL1 / SA 516 GR.70
SKIRT/ ~~SUPPORT~~ BASE	SA 516 GR.70
INTERNAL PARTS (WELDED)	SS 347 / SS 321
INTERNAL PARTS (BOLTED)	SS 347 / SS 321
CLIPS & ATTACHMENTS (EXTERNAL)	SA 387 GR.11 CL1
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 387 GR.11 CL1
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	-
LIFTING LUG	SA 387 GR.11 CL1

NO PIPE DAVIT, PLATFORM OR PIPING SHALL BE SUPPORTED FROM THE EQUIPMENT

$ ERECTION WEIGHT INDICATED IS EXCLUSIVE OF WEIGHT OF INSULATION, INTERNALS, CATALYST AND INERT BALLS.

SPECIAL SERVICE : 0 **CYCLIC, H2S & HYDROGEN/BENZENE/AROMATIC SERVICE**

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) 0

ERECTION	77000 $	OPERATING	165000
HYDROTEST(SHOP)	145500	HYDROTEST (FIELD)	168000
NUMBER OF ITEMS :	TWO		

REV	DATE	REVISION	BY	CHECKED	APPROVED
0	14.01.2025	ISSUED FOR PURCHASE	ROHIT	AD/VIVEK	PB
B	22.05.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB
A	14.05.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईंग नम्बर	REV
PGH 2ND STAGE REACTOR	पीजीएच सैकंड स्टेज रिएक्टर	B957-302-80-42-DS-3202	0
ITEM NO. 302-RB-00-2701 A/B	आइटम नम्बर 302-आरबी-2701ए/बी	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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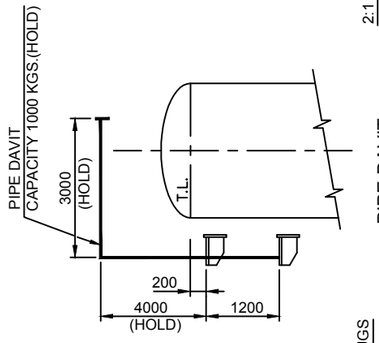
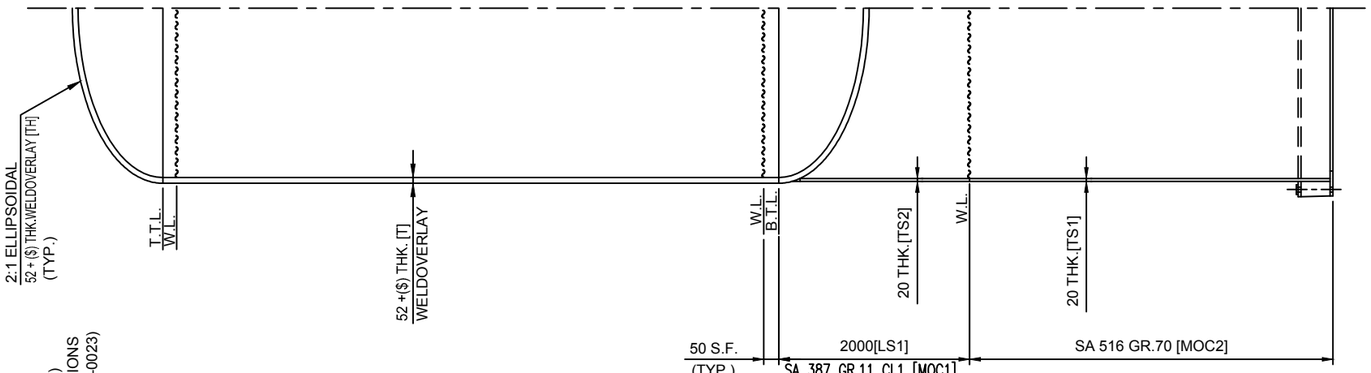
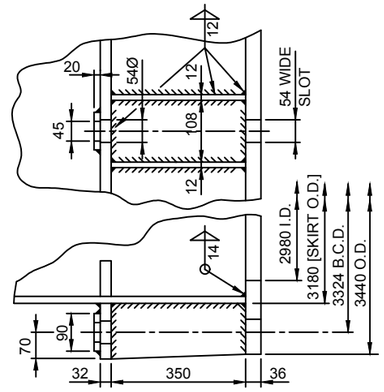


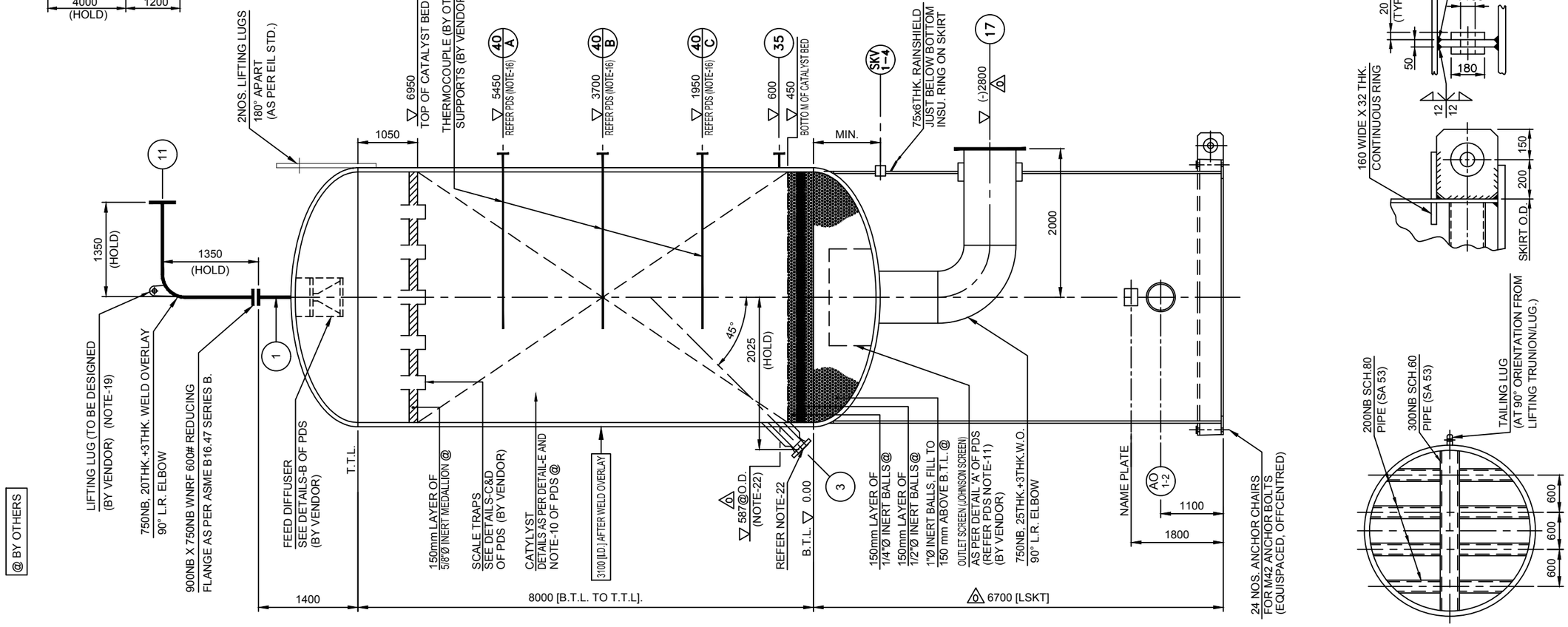
PIPE DAVIT
(LOOSE SUPPLY)
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0023)

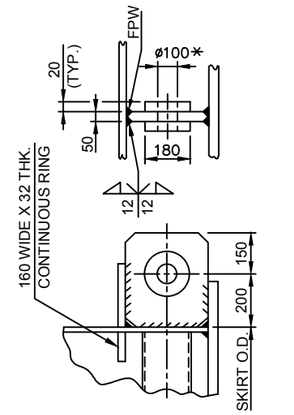
$ REFER NOTE-20





SKIRT BASE DETAIL △6
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0004)





DETAIL OF TAILING LUG
VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.

STIFFENING DETAIL OF SKIRT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
0	14.01.2025	ISSUED FOR PURCHASE	ROHIT	AD/VIVEK	PB	
B	22.05.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	
A	14.05.2025	ISSUED FOR BIDS/ENGG.	ROHIT	AD/VIVEK	PB	

VESSEL DESIGN DATA
PGH 2ND STAGE REACTOR
ITEM NO. 302-RB-00-2701A/B

वेसल डिजाइन डाटा
पीजीएच सैकंड स्टेज रिएक्टर
आईटम नम्बर 302-आरबी-00-2701ए/बी

DRAWING NO. B957-302-80-42-DS-3202 | REV. 0

SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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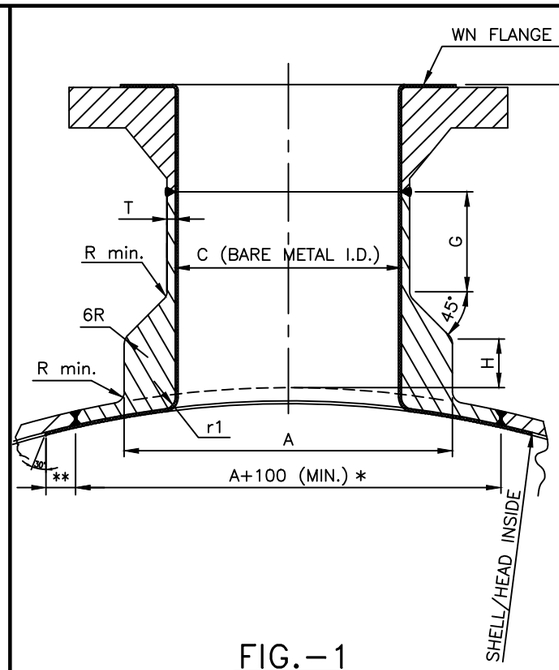

FIG.–1

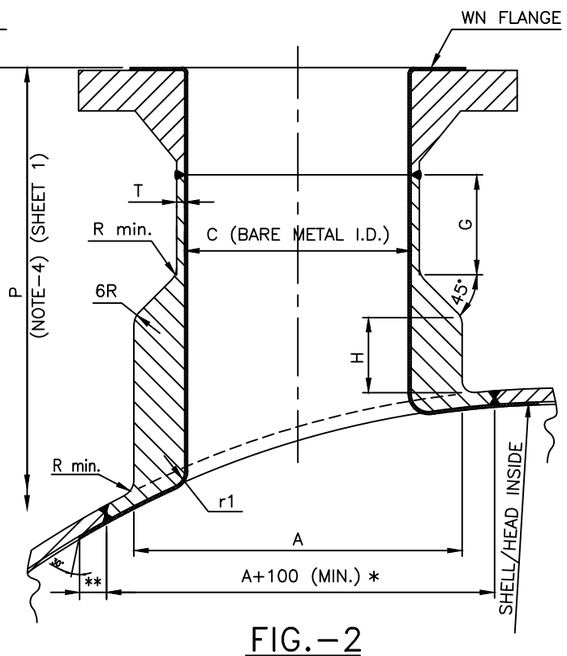

FIG.–2

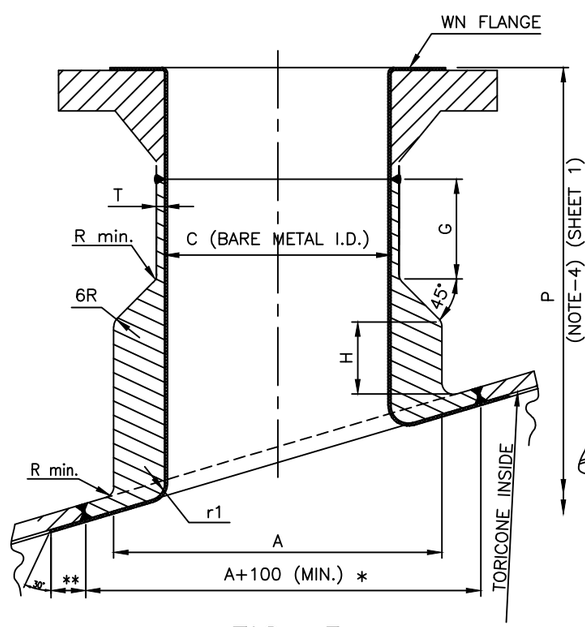

FIG.–3

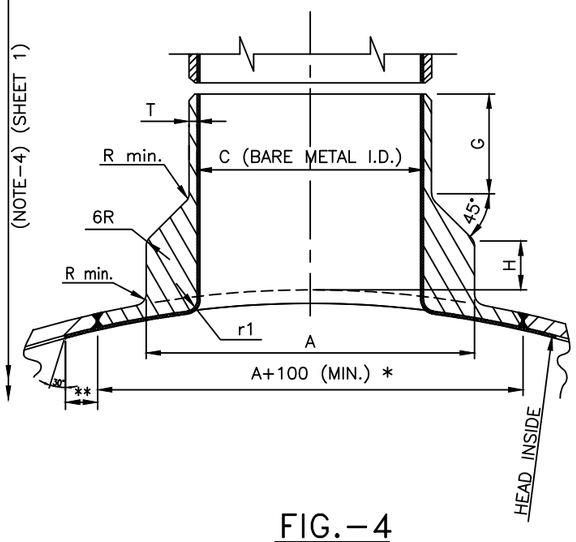

FIG.–4

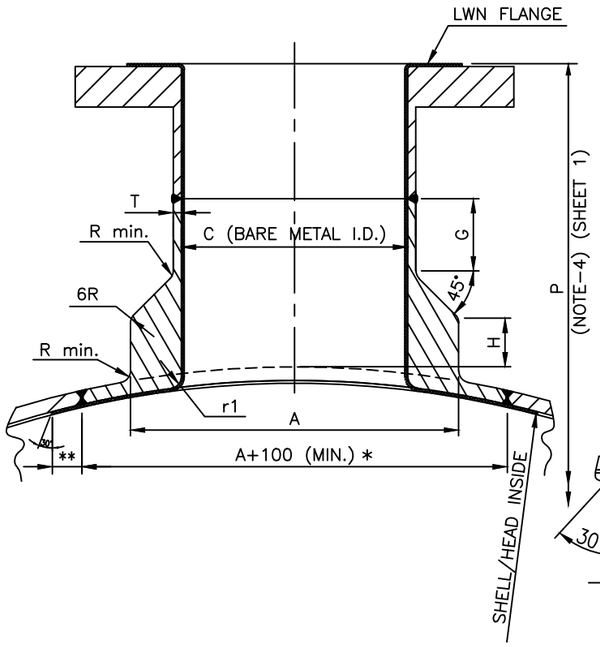

FIG.–5

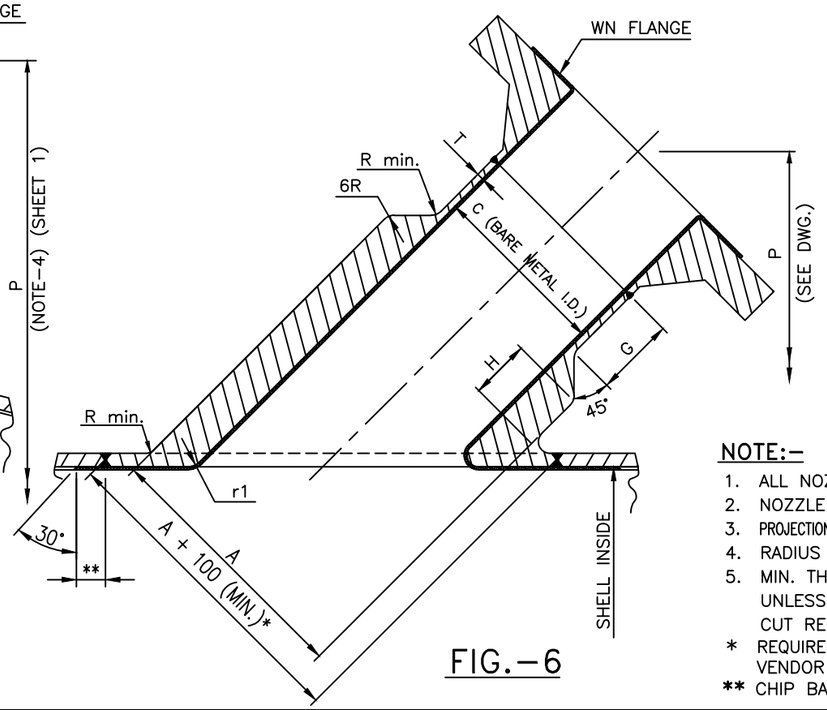

FIG.–6

NOZZLE MARK	SIZE (NB) (NOTE–1,2&5)	P (MM)	A (MM)	C (MM) &	H (MM)	T (MM)	G (MM) (MIN.) (NOTE–3)	FIG.
1	900	SEE DWG.	1330	871	130	25	50	1
17	750	SEE DWG.	1120	718	130	25	50	4
0 35 & 40A/B/C	76.2 ID.	1850	160	76.2	50	20.54	50	5
3	200	SEE DWG.	355	193.7	130	SCH.80	50	6

DETAIL OF SELF REINFORCED WELD NECK NOZZLE

NOTE:–

1. ALL NOZZLE TO SHELL JOINTS ARE TO BE FULLY RADIOGRAPHED EXCEPT FOR 80 NB NOZZLES.
2. NOZZLE OF SIZE 80 NB ARE SRWN WITHOUT LIP.
3. PROJECTION 'P' SHALL BE MAINTAINED. 'G' VALUE FURNISHED ARE MINIMUM AND SHALL BE SUITABLY INCREASE TO MAINTAIN PROJECTION 'P'.
4. RADIUS 'R min','r1' TO BE FINALISED IN ACCORDANCE WITH DESIGN CODE & API–934C CL. 4.3(C).
5. MIN. THICKNESS OF FLANGES SHALL BE AS PER ASME B16.5/B16.47 SERIES B AS APPLICABLE UNLESS OTHERWISE SPECIFIED. VENDOR TO CONSIDER EXTRA THICKNESS OF FLANGE TO MEET UNDER CUT REQUIREMENT (IF ANY) FOR WELD OVERLAY.

* REQUIREMENTS OF ASME SEC VIII DIV–1 FIG UW–16.1f(4) & API–934C CL. 4.3(C) SHALL BE FOLLOWED. VENDOR TO INCREASE THE LIP DIMENSION IF REQUIRED.

** CHIP BACK CLADDING BEFORE WELD METAL DEPOSIT.

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
0	14.01.2026	ISSUED FOR PURCHASE	ROHIT	AD/VIVEK	PB	
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VESSEL DESIGN DATA
PGH 2ND STAGE REACTOR
ITEM NO. 302–RB–2701A/B

वेसल डिजाइन डाटा
पीजीएच सैकंड स्टेज रिएक्टर
आईटम नम्बर 302–आरबी–2701ए/बी

DRAWING NO. B957–302–80–42–DS–3202 | REV. 0

SHEET 3 OF 3

1–1641–0503 REV.0 A3–420x297

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PDS REV.0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	400	14 THK	150	WN	RF	SEE DWG.	200X T	VAPOR OUTLET
N2	1	300	14 THK	150	WN	RF	1930	135X T	SOLVENT FEED INLET
N3	1	80	160	300	WN	RF	1920	40X T	REFLUX
N4A-B	2	150	80	300	WN	RF	1950	70X T	HC FEED
N5A-B N6A-B	4	150	80	300	WN	RF	1950	70X T	HC FEED (ALTERNATIVE)
N7	1	500	14 THK	150	WN	RF	2750	250X T	REBOILER INLET
N8	1	750	14 THK	150	WN	RF	2750	380X T	REBOILER RETURN
N9	1	50	160	300	WN	RF	1900	-	WATER INJECTION
N10	1	500	14 THK	150	WN	RF	SEE DWG.	250X T	BOTTOM LIQUID OUTLET
N11	1	250	80	300	WN	RF	2650	135X T	MIN. PUMP CIRC. FLOW
N12	1	REFER SHEET-3			WN	RF	2850	700X T	STAB-IN REBOILER CONNECTION
N13	1	50	160	300	WN	RF	2600	-	REBOILER PAN DRAIN OUT
N14	1	50	160	300	WN	RF	2600	-	REBOILER PAN DRAIN IN
M 1-6	6	600	14 THK.	150	WN	RF	2030	255X T	MANHOLE + BF + GASKET + BOLTING
M 7-10	4	600	14 THK.	150	WN	RF	2050	300X T	MANHOLE + BF + GASKET + BOLTING
M 11-13	3	600	14 THK.	150	WN	RF	2750	300X T	MANHOLE + BF + GASKET + BOLTING
P1-3	3	50	160	300	WN	RF	1900	-	PI CONNECTION
P4	1	50	160	300	WN	RF	2600	-	PI CONNECTION
L1 A-B	2	50	160	300	WN	RF	2600	-	STAND PIPE
L2A-C L3A-C	6	50	160	300	WN	RF	2600	-	LEVEL TRANSMITTER (DP)
L5 A-B	2	50	160	300	WN	RF	2600	-	LEVEL TRANSMITTER (DP)
T1-13	13	50	160	300	WN	RF	1900	-	TI CONNECTION
T14	1	50	160	300	WN	RF	2600	-	TI CONNECTION
T15	1	50	160	300	WN	RF	2600	-	TIC CONNECTION
UC	1	80	160	300	WN	RF	2650	45X T	STEAM-OUT
V	1	50	160	300	WN	RF	SEE DWG.	-	VENT
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.					ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.					SKIRT VENT

T' DENOTES CORRESPONDING SHELL/CONE/DISH END/SKIRT NOMINAL THICKNESS

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकश्सन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊंडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	1740000	60000
WIND	4405000	91000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, PRIMER & FINISH PAINT SHALL BE CARRIED OUT AT YARD BY EQUIPMENT VENDOR AS PER PAINTING SPEC.
13 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH NEAREST MANHOLE.
14 VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT190ºC.
15 LIFTING TRUNNION & TAILING LUGS SHALL BE DESIGNED BY VENDOR FOR ALL THE SECTIONS IN DRESSED UP CONDITION (CONSIDERING AN IMPACT FACTOR OF 1.5).CALCULATION TO BE SUBMITTED FOR REVIEW. VENDOR TO PROVIDE INSERT PLATE OF SUITABLE SIZE AND THICKNESS WHEREVER TAILING LUGS & LIFTING TRUNNIONS ARE WELDED TO SHELL. DESIGN CALCULATION SHALL INCLUDE CHECK FOR SKIRT THK., SHELL THK., BASE BLOCK FOR LIFTING/TAILING FORCES. ANY ADDITIONAL REQUIREMENT OF INCREASE THICKNESS OF ANY COMPONENT OR PROVIDING STIFFENERS, INSERT PLATE OVER AND ABOVE WHICH IS INDICATED IN DATASHEET SHALL BE PROVIDED BY VENDOR WITHOUT ANY TIME & COST IMPLICATION. INDUCED STRESSES AT THE JUNCTION OF SHELL & TRUNNION SHALL BE LIMITED TO 0.9 OF YIELD STRESS.TAILING LUG SHALL BE PROVIDED 90° TO THE LIFTING LUG/LIFTING TRUNNION. VENDOR SHALL INDICATE C.G. OF EQUIPMENT IN FABRICATION DRAWING.
16 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
17 **AT YARD:** EQUIPMENT SHALL BE FIRST COMPLETELY FABRICATED, HYDROTESTED IN SINGLE PIECE AND PAINTED. THEREAFTER IT SHALL BE CUT IN MAXIMUM THREE (3) SECTION. FABRICATOR SHALL PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING AND REJOINING ALLOWANCE.
AT SITE: EQUIPMENT SHALL BE ERECTED IN SECTIONS AND CIRCUMFERENTIAL SEAMS SHALL BE COMPLETED IN IN-SITU POSITION. LOCAL PWHT & NDT SHALL BE CARRIED OUT AS PER DRAWING. LOCAL BOX TYPE HYDROTESTING FORM INSIDE SHALL BE CARRIED OUT FOR IN-SITU CIRCUMFERENTIAL SEAMS. COMPLETE HYDROTEST OF ENTIRE COLUMN IS NOT ENVISAGED AFTER ERECTION AT SITE.
18 AT TOP, MAXIMUM PRESSURE DROP OF 1.2 KG/SQ.CM & LIQUID LEVEL OF 16700 MM DUE TO LIQUID OVERFILL CASE (I.E. TOTAL 6.5 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
19 FOR DENSITY OF LIQUID, REFER PROCESS DATASHEET.
20 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100%RADIOGRAPHED.
21 COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
X	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

X	NOZZLE ORIENTATIONS	B957-303-16-43-NZ-43001
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
X	PROCESS DATASHEET	303-CC-00-3501

HOLD UPS (होल्ड अप्स)

	NOZZLE ORIENTATIONS		SIZE OF NOZZLES
X	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	TOP: 0.5 BOTTOM:1.7
DESIGN PRESSURE (NOTE-18) (kg/cm²g)	INT. 3.5 EXT. --
WORKING TEMPERATURE (°C)	TOP: 93.3-96.5 BOTTOM: 161.2-169.9
DESIGN TEMPERATURE (°C)	250
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD / CONE 1
RADIOGRAPHY	SHELL FULL HEAD / CONE FULL
POST WELD HEAT TREATMENT	YES (NOTE-21)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	HYDROCARBONS
SP. GRAVITY	(NOTE-19)
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	867.7
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-12)
INSULATION THICKNESS (mm) (IH)	50 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/~~BOOT~~	SA 516 Gr.70
REINFORCEMENT PAD/INSERT PLATE	SA 516 Gr.70
HEADS	SA 516 Gr.70
~~SHELL FLANGES/SR/LWN~~	-
NOZZLE FLANGES/LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE #
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7/ SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304 / SS 410
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/SS 304L/SS410S
INTERNAL PARTS (BOLTED)	SS 304L/SS 410S
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR/B0 WELDED OVER BQCS PAD.
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR/B0
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	-
LIFTING TRUNION	SA 516 GR.70
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

$ ERECTION WEIGHT INDICATED IS EXCLUSIVE OF WEIGHT OF INTERNALS, PLATFORMS, INSULATION, PIPING SPOOL, ETC.

SITE FABRICATED COLUMN
U-CODE STAMPED

SPECIAL SERVICE : BENZENE/AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एप्रौक्सिमेंट वजन)

ERECTION	474000 $	OPERATING	1123000
HYDROTEST(SHOP)	1341700	HYDROTEST (FIELD)	1688000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
0	28.11.2025	ISSUED FOR PURCHASE	AS	CRG/VIVEK	PB
C	09.06.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	CRG/VIVEK	PB
B	06.06.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	CRG/SRIKANTH	PB
A	16.04.2025	ISSUED FOR BIDS / ENGG.	AS	CRG/SRIKANTH	PB

DESIGN DATA	EXTRACTIVE DISTILLATION COLUMN
ITEM NO.	303-CC-00-3501
डिजाइन डाटा	एक्स्ट्रेक्टिव डिस्टिलशन कॉलम
आइटम नम्बर	303-सीसी-00-3501
DRAWING NUMBER डाईग नम्बर	B957-303-80-42-DS-3001
REV	0
	SHEET 1 OF 3

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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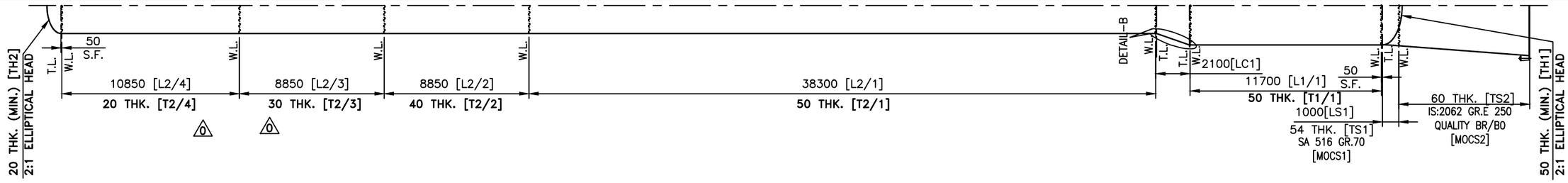
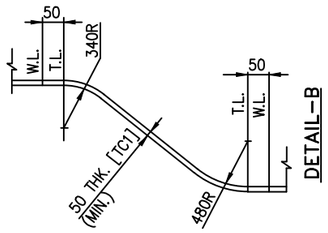
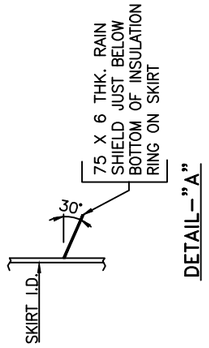
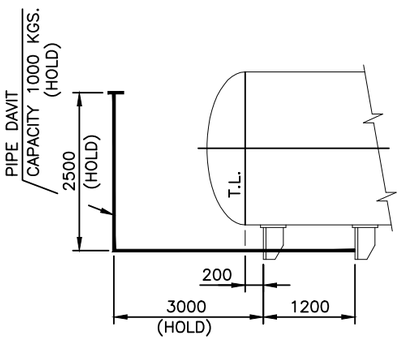




DETAIL-B



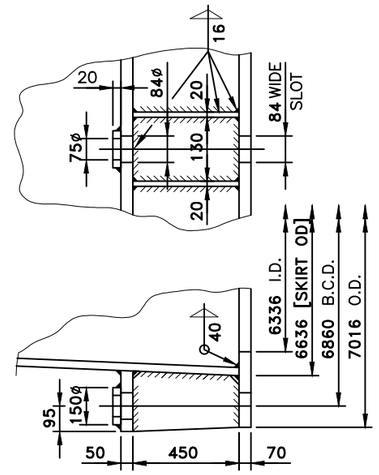
DETAIL-"A"



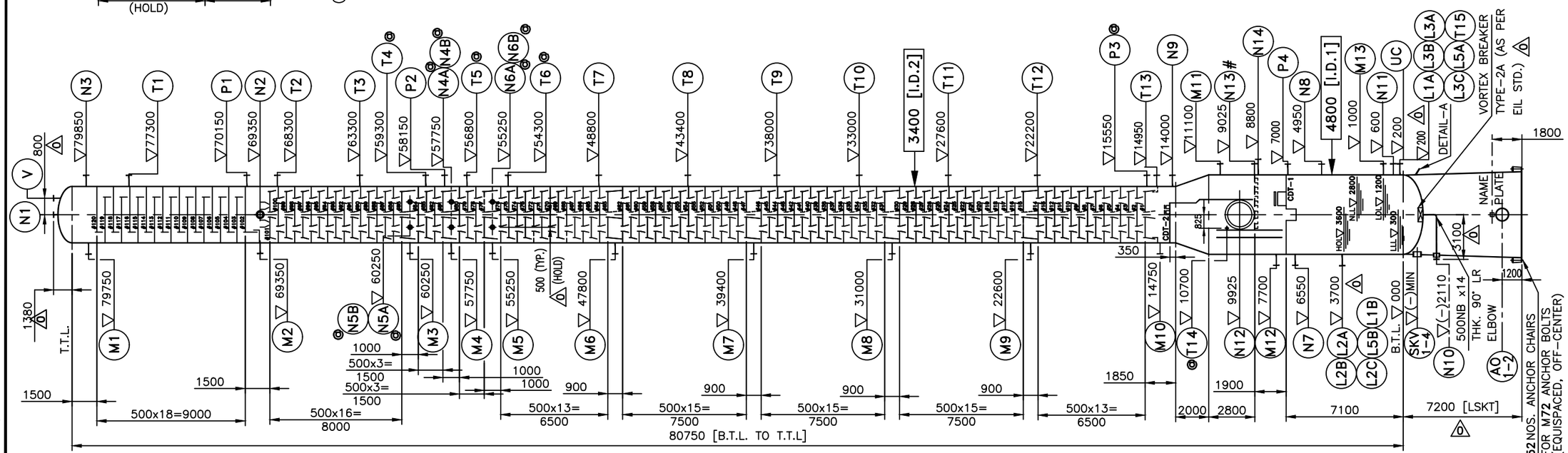
PIPE DAVIT (ALL OTHER DIMENSIONS AS PER EIL STD.)

⊙= OFFSET NOZZLE REFER PDS
#= NOZZLE N13 TO FLUSH WITH THE BOTTOM OF STAB-IN REBOILER PAN.

ELEVATION OF ALL NOZZLES SHALL BE DETERMINED AT DETAILED ENGINEERING IN CORRELATION WITH TOWER INTERNALS DESIGN.



SKIRT BASE DETAIL (ALL OTHER DIMENSIONS AS PER EIL STD.)



REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
0	02.12.2025	ISSUED FOR PURCHASE	AS	CRG/VIVEK	PB	
C	09.06.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	
B	06.05.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	CRG/SRIKANTH	PB	
A	16.04.2025	ISSUED FOR BIDS/ENGG.	AS	CRG/SRIKANTH	PB	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
EXTRACTIVE DISTILLATION COLUMN
ITEM NO. 303-CC-00-3501

वेसल डिजाइन डाटा
एक्स्ट्रेक्टिव डिस्टिलेशन कॉलम
आइटम नम्बर 303-सीसी-00-3501

DRAWING NO. B957-303-80-42-DS-3001
REV. 0
SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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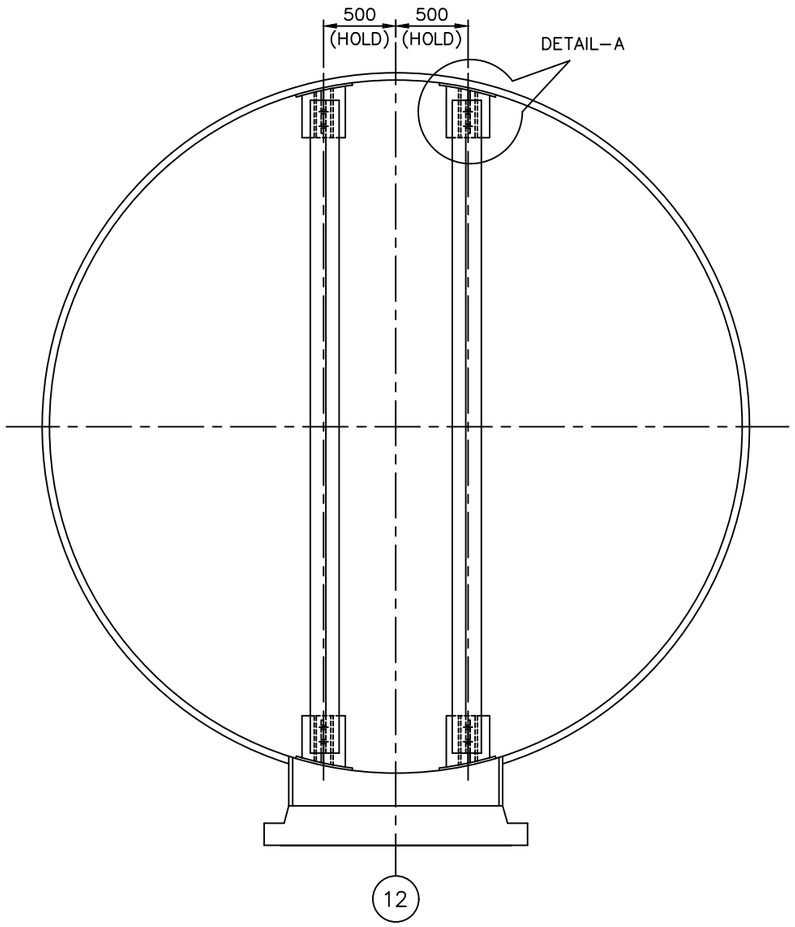
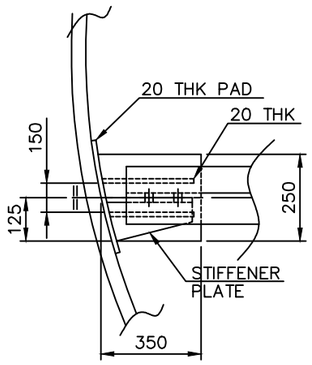
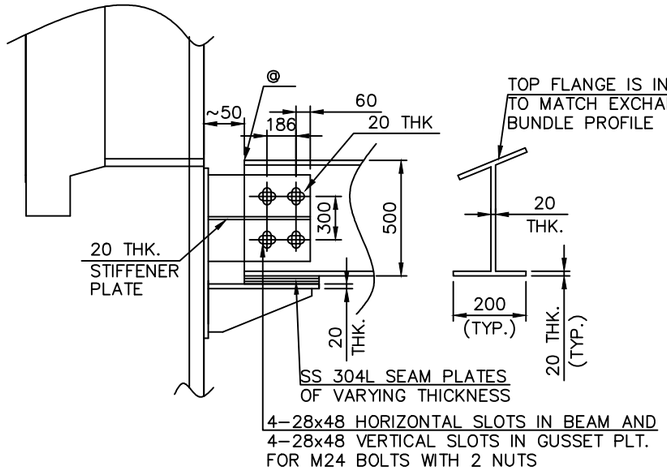
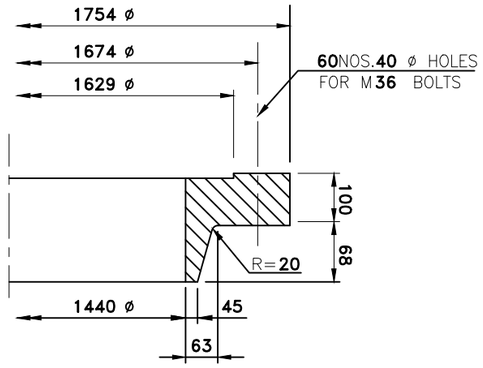






DETAIL–A



DETAIL OF NOZZLE –12 △0

@ BEAM TOP TO FLUSH WITH NOZZLE ID AT AN OFFSET OF 500mm (HOLD)

BEAM SUPPORT FOR STUB–IN REBOILER CONNECTION SHALL BE PROVIDED BY VENDOR. CONSIDERING WEIGHT OF EXCHANGER AS 20000 kgs. DEFLECTION OF BEAM SHALL BE RESTRICTED TO 3mm.

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
0	02.12.2025	ISSUED FOR PURCHASE	AS	CRG/VIVEK	PB	
C	09.06.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	

VESSEL DESIGN DATA
EXTRACTIVE
DISTILLATION COLUMN
ITEM NO. 303-CC-00-3501

वेसल डिजाइन डाटा
एक्स्ट्रेक्टिव डिस्टिलशन कॉलम
आइटम नम्बर 303-सीसी-00-3501

DRAWING NO. B957–303–80–42–DS–3001 | REV. 0

SHEET 3 OF 3

1–1641–0503 REV.0 A3–420x297

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PDS REV.1.

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	1000	18 THK.	150	WN	RF	SEE DWG.	505XT	VAPOR OUTLET
N2	1	100	120	300	WN	RF	1920	60XT B	REFLUX
N3 A~B	2	750	18 THK.	150	WN	RF	1970	380XT	FEED INLET
N4	1	600	18 THK.	150	WN	RF	2780	300XT B	STRIPPING STEAM INLET
N5 A~B	2	1250 (H)	34 THK.	300	WN	RF	2930	@	STAB IN REBOILER CONNECTION
N6	1	400	18 THK.	150	WN	RF	SEE DWG.	200XT	BOTTOM LIQUID OUTLET
N7	1	50	160	300	WN	RF	2680	-	REBOILER PAN DRAIN OUT
N8	1	50	160	300	WN	RF	2680	-	REBOILER PAN DRAIN IN
N9	1	100 (H)	120	300	WN	RF	2730	60XT B	MIN.PUMP CIRC.FLOW
N10	2	450	18 THK.	150	WN	RF	1970	225XT B	PSV CONNECTION
M 1~4	4	600	18 THK.	150	WN	RF	1970	300XT B	MANHOLE + B.F + DAVIT
M 5~6	2	600	18 THK.	150	WN	RF	2780	300XT B	MANHOLE + B.F + DAVIT
P 1~5	5	50 (H)	160	300	WN	RF	1870	-	PI CONNECTION
P6	1	50 (H)	160	300	WN	RF	2680	-	PI CONNECTION
B LT 1~8	8	50 (H)	160	300	WN	RF	2680	-	LEVEL TRANSMITTER(DP)
B SP 1-2	2	50 (H)	160	300	WN	RF	2680	-	STAND PIPE
T 1~4	4	50 (H)	160	300	WN	RF	1870	-	TI CONNECTION
T5	1	50 (H)	160	300	WN	RF	2680	-	TI CONNECTION
T6	1	50 (H)	160	300	WN	RF	2680	-	TIC CONNECTION
UC	1	50	160	300	WN	RF	2680	-	STEAM OUT
V	1	50	160	300	WN	RF	SEE DWG.	-	VENT
SKV 1-4	4	100	40	AS PER STANDARD					SKIRT VENT
AO 1-2	2	500 I.D.	14 THK.	AS PER STANDARD					ACCESS OPENING

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS.

'H' DENOTES (HOLD)

@ INSERT PLATE REFER SHEET-2

B

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉऊडशन लोडिगं डाटा (आपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	1590000	66000
-	-	-
WIND	1410000	48500

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14 VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºc
15 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
16 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
17 AT TOP, MAXIMUM PRESSURE DROP OF 0.19 KG/SQ.CM & LIQUID LEVEL OF 15000 MM DUE TO LIQUID OVER FILL CASE (I.E. TOTAL 5.4 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
18 EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION, PLATFORM/LADDERS ETC. (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT.
19 COLUMN SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM TWO SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF COLUMN SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). COLUMN SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY COLUMN FABRICATOR.100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY COLUMN FABRICATOR. NDT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE COLUMN AT SITE IS NOT ENVISAGED.
20 B COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
21 B ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
X	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
X	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038
X	PART DETAILS (SHELL AND TUBE EXCHANGERS)	7-15-0001

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	-
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
	PROCESS DATA SHEET	-
	INTERNALS DETAIL (FEED PIPE / DIST.)	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
		X	PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	TOP (-) 0.46 BOTT. (-) 0.27
DESIGN PRESSURE	(kg/cm^2g)	INT. 3.5 (NOTE-17) EXT. F.V
WORKING TEMPERATURE	(ºC)	TOP 77.5-84.6 BOTT. 175
DESIGN TEMPERATURE	(ºC)	250
MDMT	(ºC)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		B SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		B YES (NOTE-20)
HEAT TREATMENT		HEAD: AS PER CODE/SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		1.14
WIND SPECIFICATION		IS 875 (PART-3)
SEISMIC		IS 1893 + SITE SPECTRA (PART-4)
CAPACITY	(M^3)	417
PAINTING/CLEANING		AS PER JOB SPECIFICATION (NOTE-12)
INSULATION THICKNESS (mm) (IH)		50 [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		4.55
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/INSERT PLATE	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR /BO
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	SA 516 GR.70/ SS304L / SS410S / SS304
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/IS 2062 GR.E 250 BR/B0 QUALITY WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR /B0
PIPE DAVIT	SA 106 GR. B
VACUUM STIFFENER	SA 516 GR.70
LIFTING LUG	SA 516 GR.70
TAILING LUG	IS 2062 GR. E 250 QUALITY BR/B0

@ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP, AND OPERATIING LIQUID

U-CODE STAMPED
SITE ASSEMBLED COLUMN

B **SPECIAL SERVICE : AROMATIC/ BENZENE SERVICE**

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

	INDIAN BOILER REGULATIONS (IBR)
B	**DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एप्रौक्सिमेंट वजन) (HOLD)

ERECTION	133000	OPERATING	628000
HYDROTEST(SHOP)	550000	HYDROTEST (FIELD)	698000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	29.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB
A	04.07.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER डाईग नम्बर	REV
SOLVENT RECOVERY COLUMN	सालवेंट रिकवरी कॉलम	B957-303-80-42-DS-3002	B
ITEM NO. 303-CC-00-3502	आइटम नम्बर 303-सीसी-00-3502	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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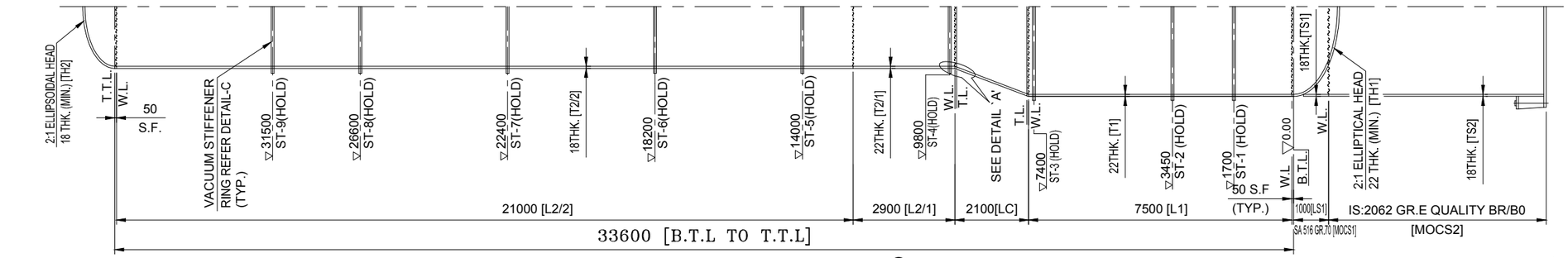
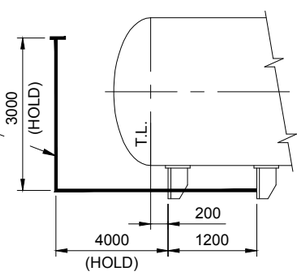
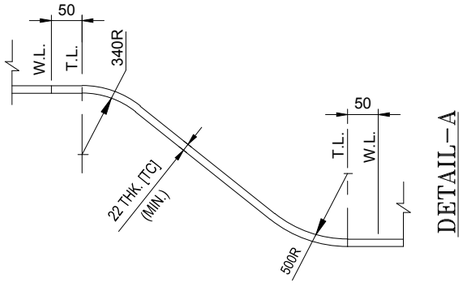
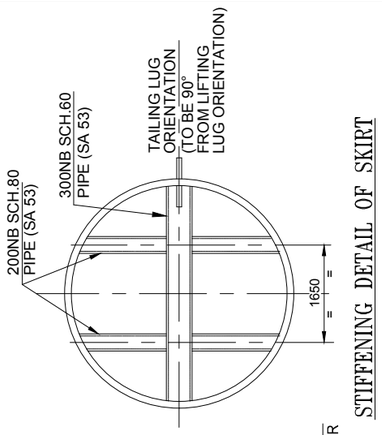




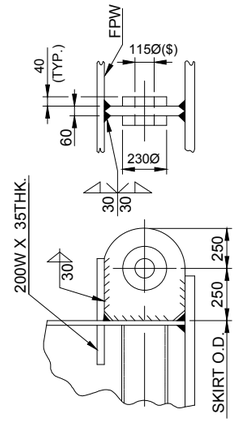
PIPE DAVIT
(ALL OTHER DIMENSIONS AS PER EIL STD.)



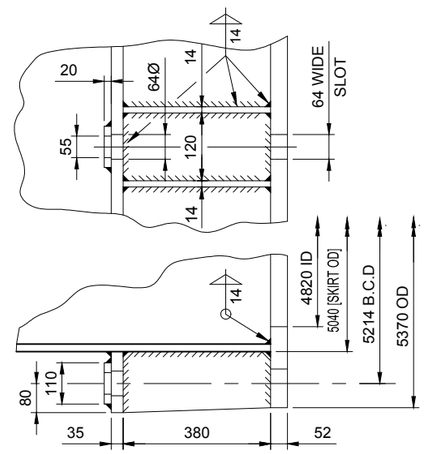
DETAIL–A



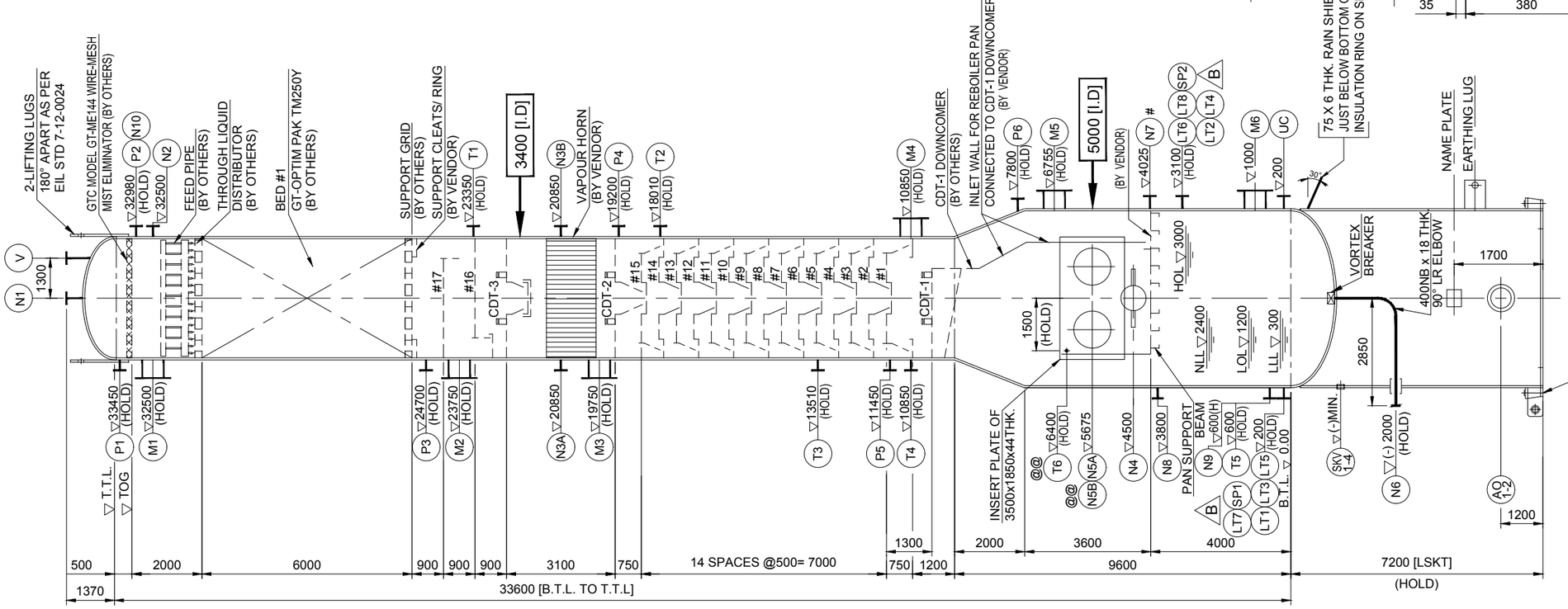
STIFFENING DETAIL OF SKIRT



TAILING LUG DETAIL
$ VENDOR TO ENSURE ADEQUACY OF HOLE DIA.



SKIRT BASE DETAIL (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



B	29.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
A	04.07.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
REV.	DATE	DESCRIPTION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
SOLVENT RECOVERY COLUMN
ITEM NO. 303-CC-00-3502

वेसल डिजाइन डाटा
साल्वेंट रिकवरी कॉलम
आइटम नम्बर 303-सीसी-00-3502

DRAWING NO.	REV.
B957-303-80-42-DS-3002	B

SHEET 2 OF 3

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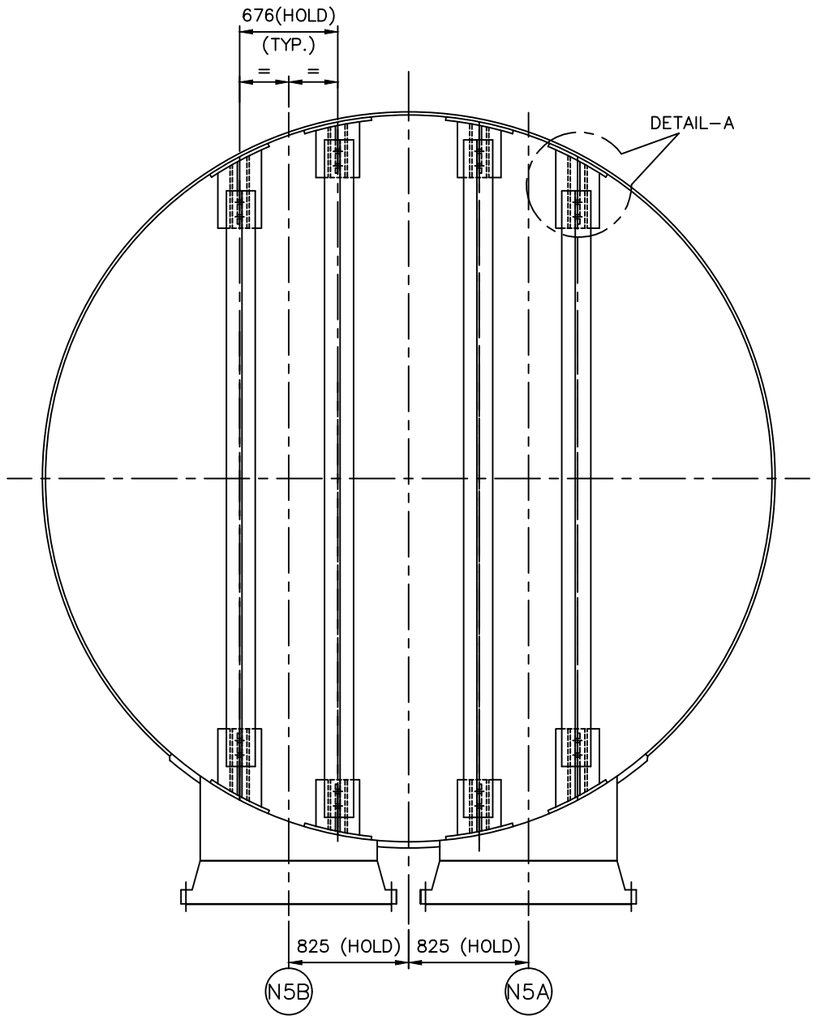
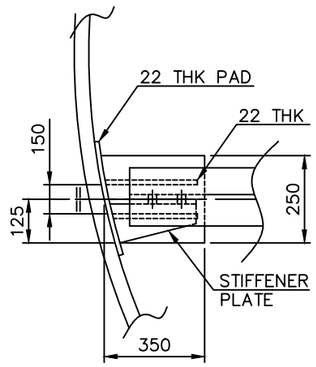


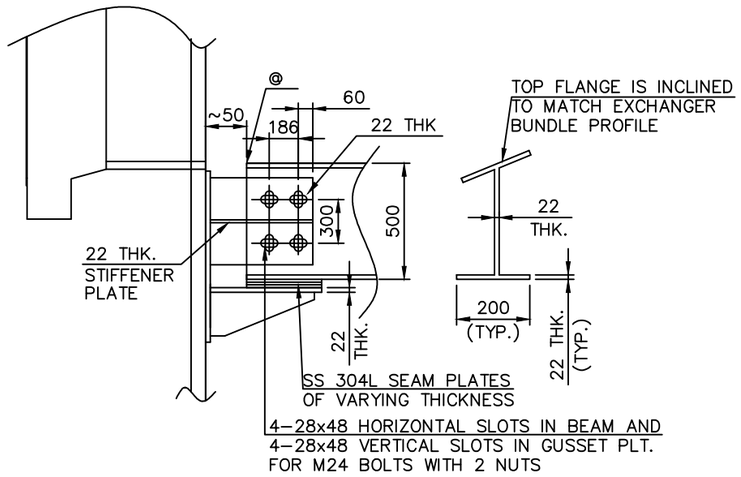
SUPPORT DETAILS FOR REBOILER (HOLD)

(MOC: SA516 GR.70)

@ BEAM TOP TO FLUSH WITH NOZZLE I.D.

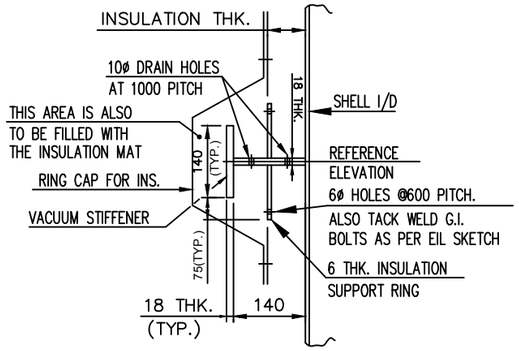
BEAM SUPPORT FOR STUB–IN REBOILER CONNECTION SHALL BE PROVIDED BY VENDOR. CONSIDERING WEIGHT OF EXCHANGER AS 16000 kgs. DEFLECTION OF BEAM SHALL BE RESTRICTED TO 3mm.DETAIL GIVEN ARE MINIMUM TO BE FOLLOWED.





DETAIL–A

(HOLD)

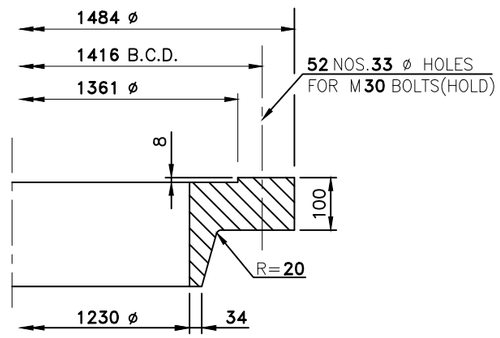


- VACUUM STIFFENERS SHALL BE USED AS INSULATION SUPPORT.
- ADDITIONAL INSULATION SUPPORTS TO BE PROVIDED AS PER 7–12–0025 WHEREVER REQUIRED.

NOTE– INDICATED DETAILS OF STIFFNERS ARE ON INSERT OD / SHELL OD. WHEREVER VACUUM STIFFENER IS COMING ON INSERT PLATE, VENDOR TO INCREASE THE WEB WIDTH THAT LOCATION OF SHELL.

VACUUM STIFFENER DETAIL

(TYP.)



DETAIL OF NOZZLE – N5A/B(HOLD)

(REFER FIG–2 OF 7–15–0001)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	DESCRIPTION	BY	CHK	APPROVED	APPROVED
B	29.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
A	04.07.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	

VESSEL DESIGN DATA
SOLVENT RECOVERY COLUMN
ITEM NO. 303-CC-00-3502

वेसल डिजाइन डाटा
साल्वेंट रिकवरी कॉलम
आइटम नम्बर 303-सीसी-00-3502

DRAWING NO.	REV.
B957-303-80-42-DS-3002	B
SHEET 3 OF 3	

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
N1	1	150	80	600	WN	RF	1780	85X T	FEED INLET
N2	1	150	80	600	WN	RF	SEE DWG.	85X T	EFFLUENT OUTLET
N3	1	800	14 THK	300	WN	RF	1930	405X T	UNLOADING (WITH BLIND)+ RETAINING PLATE
M	1	600	14 THK	300	WN	RF	SEE DWG.	300X T	MANHOLE
R	1	100	120	600	WN	RF	SEE DWG.	-	PSV CONNECTION
UC	1	50	160	600	WN	RF	1730	-	UTILITY CONNECTION
V	1	50	160	600	WN	RF	SEE DWG.	-	VENT
AO 1-2	2	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.				-	SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
0 फाऊंडशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	357000	28000
	-	-
WIND	115000	10000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC.
15. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
16. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
17. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
18. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
19. COLUMN SHALL BE COMPLETELY FABRICATED AND HYDROTESTED AT VENDOR'S WORKSHOP AND SUPPLIED IN SINGLE PIECE.
20. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED INTERNAL (CARBON STEEL) SHALL BE 18mm & BOLTED CARBON STEEL INTERNAL SHALL BE 12mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABILITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
X	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
X	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS.	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

0 REFERENCE DRAWINGS(रेफरेन्स डाईग)

X	NOZZLE ORIENTATIONS	B957-303-16-43-NZ-43004
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
	PROCESS DATA SHEET	-
		-

0 HOLD UPS (होल्ड अप्स)

X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	NOZZLE ORIENTATIONS		PIPE DAVIT & SUPPORTING STR.
	SIZE OF NOZZLE		PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm2g)	TOP 22.3 BOTT. 21.3
DESIGN PRESSURE (kg/cm2g)	INT. 34 EXT. -
WORKING TEMPERATURE (°C)	TOP 195-210 BOTT. 195
DESIGN TEMPERATURE (°C)	250
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-15)
HEAT TREATMENT	AS PER CODE/SPEC.
OPERATING MEDIUM	HYDROCARBONS
SP. GRAVITY	0.6797/0.6794
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	IS-1893 (PART-4) + SITE SPECTRA
CAPACITY (M3)	110.5
PAINTING/CLEANING	AS PER JOB SPEC.(REFER NOTE-12)
INSULATION THICKNESS (mm) (IH) 0	65 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	44.2
INSPECTION BY	[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)
(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD/INSERT PLATE	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES/SR/LWN	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SKIRT/ SUPPORT	SA 516 Gr.70 / IS 2062 GR. E250 QUALITY BR/B0
SKIRT/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR /B0
INTERNAL PARTS (WELDED)	SA 516 Gr.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	SA 516 Gr.70/ SA 106 GR.B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70/ IS 2062 GR. E 250 QUALITY BR/BO WELDED OVER BQCS PAD
PAD FOR EXTERNAL ATTACHMENT	SA 516 Gr.70
PIPE DAVIT	SA 106 GR.B
TAILING LUG	IS 2062 GR. E 250 QUALITY BR /B0
LIFTING LUG	SA 516 Gr.70

`@ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP, AND OPERATIING LIQUID

U-CODE STAMPED

SPECIAL SERVICE : BENZENE/AROMATIC SERVICE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) 0

ERECTION	67000	OPERATING	192000
HYDROTEST(SHOP)	177500	HYDROTEST (FIELD)	201000
NUMBER OF ITEMS :	TWO		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED	
0	19.02.2026	ISSUED FOR PURCHASE	AS	CRG/VIVEK	PB	
B	11.07.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	CRG/VIVEK	PB	
A	24.05.2025	ISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB	

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
CLAY TOWER	क्ले टॉवर	B957-303-80-42-DS-3004	0
ITEM NO. 303-CC-00-3601A/B	आइटम नम्बर 303-सीसी-00-3601 ए/बी	SHEET 1 OF 2	

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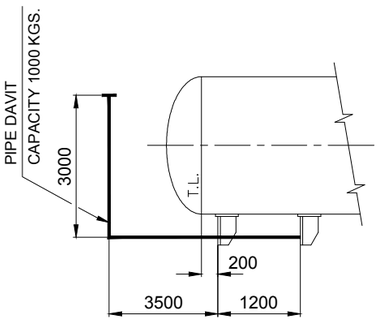
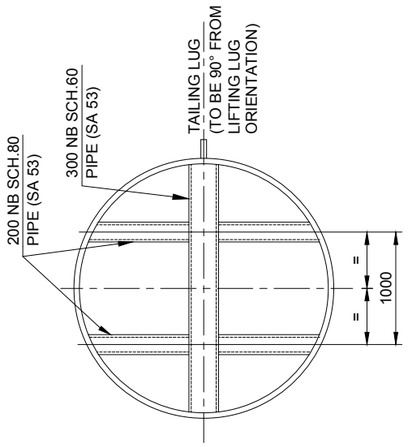
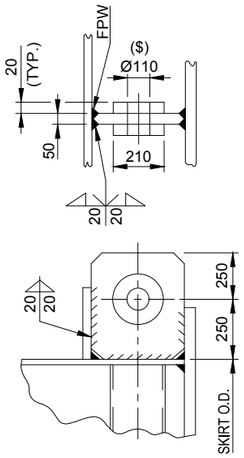


PIPE DAVIT △0

(ALL OTHER DIMENSIONS AS PER EIL STD.)

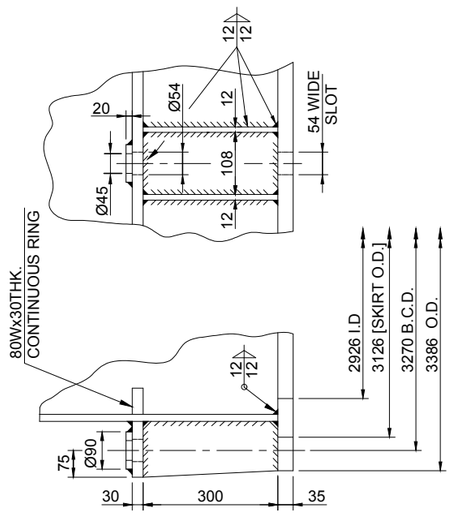


STIFFENING DETAIL OF SKIRT



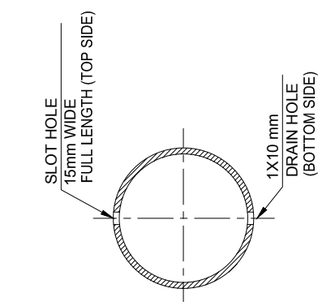
TAILING LUG DETAIL

($) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.
(REFER NOTE-23)

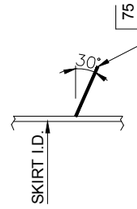


SKIRT BASE DETAIL △0

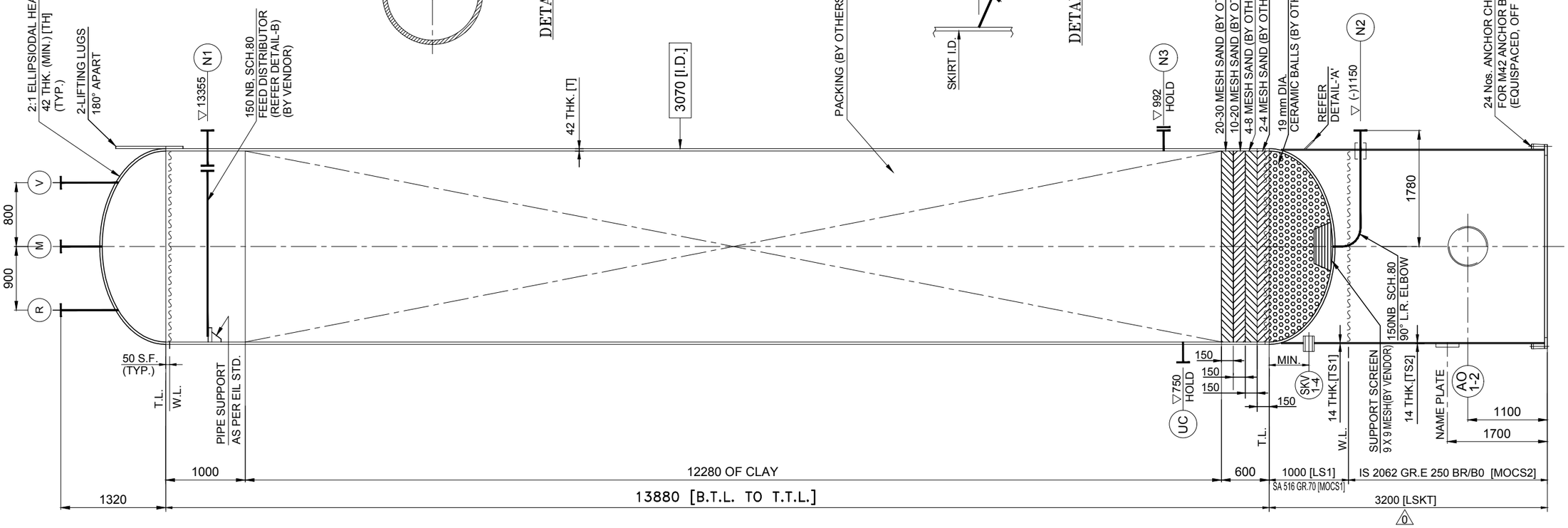
(ALL OTHER DIMENSIONS AS PER EIL STD. 7-12-0004)



DETAIL – B



DETAIL – "A"



0	17.02.2026	REVISED & REISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	
B	11.07.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	
A	24.05.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

VESSEL DESIGN DATA
CLAY TOWERS
ITEM NO. 303-CC-00-3601 A/B

वेसल डिजाइन डाटा
क्ले टॉवर
आइटम नम्बर 303-सीसी-00-3601 ए/बी

DRAWING NO. B957-303-80-42-DS-3004 | REV. 0

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	600	10 THK.	150	WN	RF	SEE DWG.	@	VAPOR OUTLET
N2	1	150	80	300	WN	RF	1610	130 X T	REFLUX
N3	1	350	14 THK.	150	WN	RF	1670	175 X T	HYDROCARBON FEED
N4	1	200	80	300	WN	RF	1610	200XT	BENZENE SIDE DRAW
N5	1	500 (H)	16 THK.	150	WN	RF	REF. DWG.	250XT	REBOILER I INLET
N6	1	750 (H)	18 THK.	150	WN	RF	1670	380XT	REBOILER I RETURN
N7	1	350 (H)	16 THK.	150	WN	RF	REF. DWG.	175XT	REBOILER II INLET
N8	1	500 (H)	16 THK.	150	WN	RF	1670	250XT	REBOILER II RETURN
N9	1	150	80	300	WN	RF	SEE DWG.	85XT	BOTTOM LIQUID OUTLET
N10	1	100 (H)	120	300	WN	RF	1620	60XT	MINIMUM PUMP CIRCULATION FLOW
M 1-5	5	600	16 THK.	150	WN	RF	1670	300 X T	MANWAY+B.F.+DAVIT
P 1-3	3	50(H)	160	300	WN	RF	1570	-	PI CONNECTION
C LT 1-8	8	50(H)	160	300	WN	RF	1570	-	LEVEL TRANSMITTER (DP)
C LG 1-2	2	50(H)	160	300	WN	RF	1570	-	LEVEL GAUGE MAGNETIC (SS)
T 1-8	8	50(H)	160	300	WN	RF	1570	-	TI CONNECTION
T 9-10	2	50(H)	160	300	WN	RF	1570	-	TDC CONNECTION
T11	1	50(H)	160	300	WN	RF	1570	-	TIC CONNECTION
UC	1	50	160	300	WN	RF	1570	-	STEAM OUT
V	1	50	160	300	WN	RF	SEE DWG.	-	VENT
AO	1	500	14 THK.	AS PER EIL STD.					ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.					SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

@ INSERT PLATE OF Ø1310 x 25THK.

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडेशन लोडिगं डाटा (आपरेटिंग कनडिशन) (HOLD)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	560000	21000
	-	-
WIND	1110000	35000

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14 VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºc
15 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
16 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
17 AT TOP, MAXIMUM PRESSURE DROP OF 0.6 KG/SQ.CM & LIQUID LEVEL OF 12000 MM DUE TO LIQUID OVERALL CASE (I.E. TOTAL 5 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
18 EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION, PLATFORM/LADDERS ETC. (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT.
19 COLUMN SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM THREE SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF COLUMN SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). COLUMN SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY COLUMN FABRICATOR.100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY COLUMN FABRICATOR. NDT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE COLUMN AT SITE IS NOT ENVISAGED.
20 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
21 C COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
X	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT (FOR GUIDANCE)	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
	PROCESS DATASHEET	-
	INTERNALS DETAIL (FEED PIPE / DIST.)	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
	STIFFENING DETAILS OF NOZZLE	X	PIPE DAVIT & SUPPORTING STR.
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	TOP 0.5 BOTT. 1.1
DESIGN PRESSURE	(kg/cm^2g)	INT. 3.5(NOTE-17) EXT. -
WORKING TEMPERATURE	(°C)	TOP 93.2 BOTT. 146.2-147.8
DESIGN TEMPERATURE	(°C)	200
MDMT	(°C)	1.1
CORROSION ALLLOWANCE	(MM)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		C YES (NOTE-21)
HEAT TREATMENT		AS PER CODE/SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		0.75
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	275.2
PAINTING/CLEANING		AS PER JOB SPECIFICATION (NOTE-12)
INSULATION THICKNESS (mm) (IH)		40 X HOT ☐ COLD
FIRE PROOFING CLEATS		X YES ☐ NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		4.55
INSPECTION BY		X EIL ☐ CIB ☐ TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD/INSERT PLATE	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES~~/SR/LWN~~	-
NOZZLE FLANGES~~/SRWN/LWN~~	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 Gr.B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234Gr.WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS-304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS-304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 Gr.B7/SA 194 Gr.2H
INTERNAL STUDS/BOLTS/NUTS	-
SKIRT/ ~~SUPPORT~~	SA 516 Gr.70 / IS 2062 GR. E 250 QUALITY BR/BO
	IS 2062 Gr. E 250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 Gr.70
INTERNAL PARTS (BOLTED)	SS 410S
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70 / IS 2062 Gr.E250 QUALITY BR/BO WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 Gr.70 / IS 2062 GR. E 250 QUALITY BR/BO
PIPE DAVIT	SA 106 Gr. B
VACUUM STIFFENER	-
LIFTING LUG	SA 516 Gr.70
TAILING LUG	IS2062 GR.E250 QUALITY BR/BO.

`@ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP, AND OPERATIING LIQUID

U-CODE STAMPED
SITE ASSEMBLED COLUMN

SPECIAL SERVICE : C **AROMATIC/ BENZENE SERVICE**

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)
DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) (HOLD)

ERECTION	84500	OPERATING	273000
HYDROTEST(SHOP)	359500	HYDROTEST (FIELD)	430000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
C	30.10.2025	REVISED & REISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB
B	04.07.2025	REVISED & REISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB
A	27.06.2025	ISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB

DESIGN DATA
BENZENE COLUMN
ITEM NO. 303-CC-00-3602

डिजाइन डाटा
बेंजीन कॉलम
आइटम नम्बर 303-सीसी-00-3602

DRAWING NUMBER
डाईग नम्बर
B957-303-80-42-DS-3005 REV C
SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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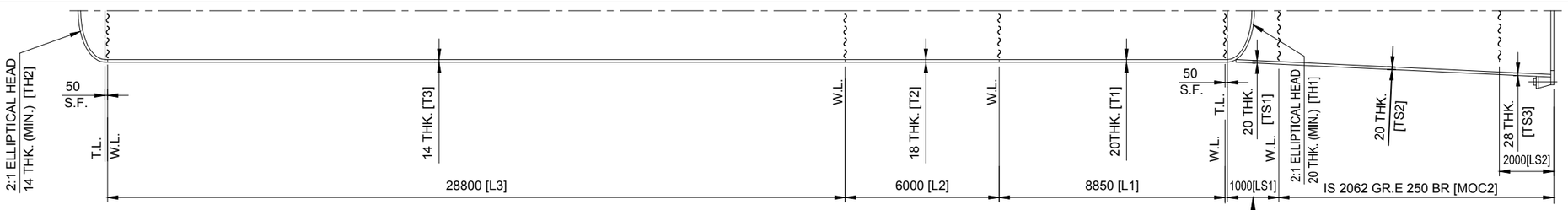
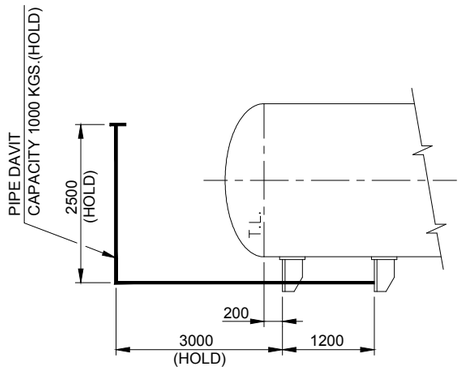
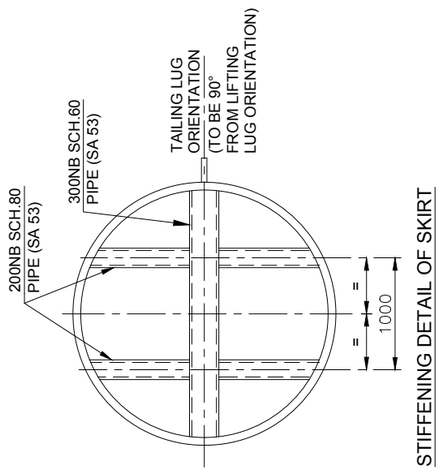
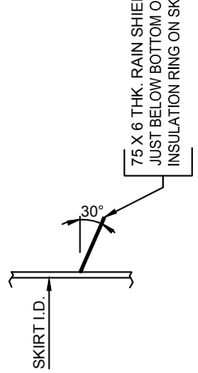




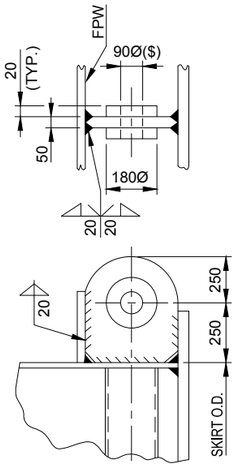
PIPE DAVIT
(ALL OTHER DIMENSIONS AS PER EIL STD.)



STIFFENING DETAIL OF SKIRT

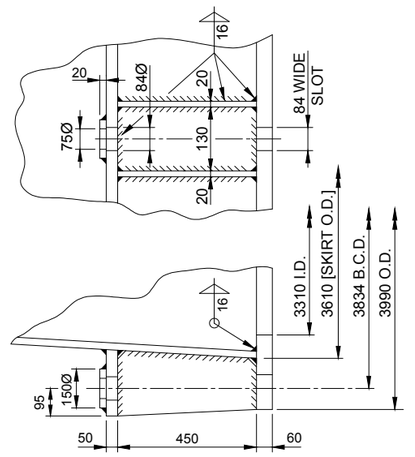


DETAIL-``A"

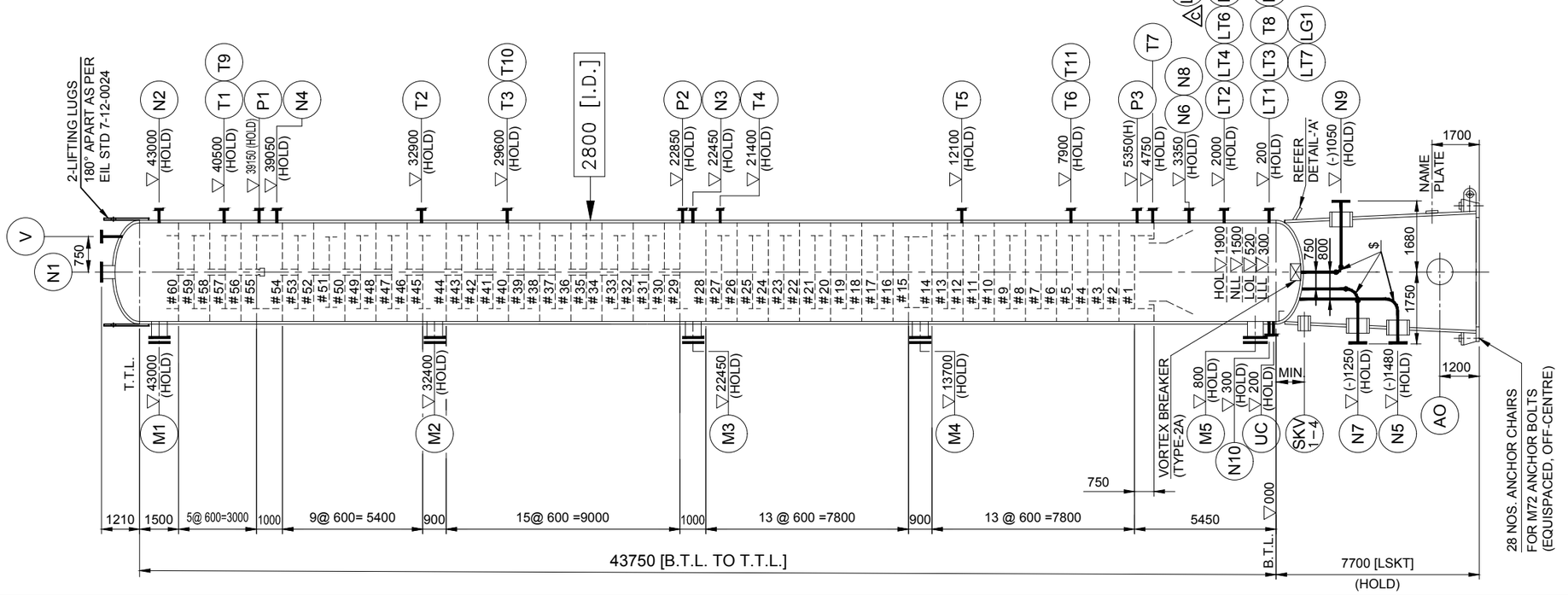


TAILING LUG DETAIL

$ VENDOR TO ENSURE ADEQUACY OF HOLE DIA.



SKIRT BASE DETAIL(HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
C	30.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
B	04.07.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
A	27.06.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	

VESSEL DESIGN DATA	वेसल डिजाइन डाटा	DRAWING NO.	REV.
BENZENE COLUMN	बेंजीन कॉलम	B957-303-80-42-DS-3005	C
ITEM NO. 303-CC-00-3602	आइटम नम्बर 303-सीसी-00-3602	SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सॉवंस
N1	1	500	14 THK.	150	WN	RF	SEE DWG.	250 X T	VAPOR OUTET
N2	1	150	80	300	WN	RF	1530	85 X T	REFLUX
N3	1	100	120	300	WN	RF	1530	60 X T	HYDROCARBON FEED
N4	1	600 (H)	14 THK.	150	WN	RF	SEE DWG.	200XT	REBOILER INLET
N5	1	750 (H)	18 THK.	300	WN	RF	-	380XT	REBOILER RETURN
N6	1	100	120	300	WN	RF	SEE DWG.	60XT	BOTTOM LIQUID OUTLET
N7	1	50(H)	160	600	WN	RF	1520	-	MINIMUM PUMP CIRCULATION FLOW
M 1-5	5	600	14 THK.	150	WN	RF	1580	300 X T	MANWAY+B.F+DAVIT
P 1-2	2	50(H)	160	300	WN	RF	1480	-	PI CONNECTION
SP 1-2	2	50(H)	160	300	WN	RF	1480	-	STAND PIPE
LT 1-8	8	50(H)	160	300	WN	RF	1480	-	LEVEL TRANSMITTER (DP)
T 1-8	8	50(H)	160	300	WN	RF	1480	-	TI CONNECTION
T 9-10	2	50(H)	160	300	WN	RF	1480	-	TDC CONNECTION
T11	1	50(H)	160	300	WN	RF	1480	-	TIC CONNECTION
UC	1	50	160	600	WN	RF	1480	-	STEAM OUT
V	1	50	160	600	WN	RF	SEE DWG.	-	VENT
AO	1	500 ID	14 THK.	AS PER EIL STD.				250 X T	ACCESS OPENING
SKV 1-4	4	100	Sch 40	AS PER EIL STD.					SKIRT VENT

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉउन्डेशन लोडिंग डाटा (ऑपरटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	530000	20000
	-	-
WIND	1100000	34500

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
15. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
16. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
17. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC.
18. COLUMN SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM THREE SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF COLUMN SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). COLUMN SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY COLUMN FABRICATOR.100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY COLUMN FABRICATOR. NDT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE COLUMN AT SITE IS NOT ENVISAGED.
19. AT TOP, MAXIMUM PRESSURE DROP OF 0.6 KG/SQ.CM & LIQUID LEVEL OF 20900 MM DUE TO LIQUID OVERALL CASE (I.E. TOTAL 8.5 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
20. EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION, PLATFORM/LADDERS ETC. (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT.
21. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
22. (B) COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
X	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
	PROCESS DATA SHEET	-
	INTERNALS DETAIL (FEED PIPE / DIST.)	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
X	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
X	STIFFENING DETAILS OF NOZZLE	X	PIPE DAVIT & SUPPORTING STR.
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	TOP 4.5 BOTT. 5.1
DESIGN PRESSURE	(kg/cm^2g)	INT. 6.5(NOTE-19) EXT. -
WORKING TEMPERATURE	(°C)	TOP 161.9 BOTT. 219.2-219.5
DESIGN TEMPERATURE	(°C)	300
MDMT	(°C)	1.1
CORROSION ALLLOWANCE	(MM)	3
TYPE OF HEAD		2:1 ELLIPSOIDAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		(B) YES (NOTE-22)
HEAT TREATMENT		HEAD:AS PER CODE/SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		0.67
WIND SPECIFICATION		IS 875 (PART-3)
SEISMIC		IS 1893 + SITE SPECTRA (PART-4)
CAPACITY	(M^3)	240
PAINTING/CLEANING		AS PER JOB SPECIFICATION (NOTE-12)
INSULATION THICKNESS (mm) (IH)		80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		8.45
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / ~~BOOT~~	SA 516 Gr.70
REINFORCEMENT PAD / INSERT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / ~~LWN~~	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE*
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	SS 410S
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/B0
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	SA 106 Gr. B
VACUUM STIFFENER	-
LIFTING LUG	SA 516 Gr.70
TAILING LUG	IS2062 GR.E250 QUALITY BR/B0

* INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

U CODE STAMPED
SITE ASSEMBLED COLUMN.

SPECIAL SERVICE : (B) **AROMATIC/ BENZENE SERVICE**

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

- **INDIAN BOILER REGULATIONS (IBR)**
- **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) (HOLD)

ERECTION	90000	OPERATING	300000
HYDROTEST(SHOP)	330000	HYDROTEST (FIELD)	394000

NUMBER OF ITEMS : ONE

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	30.10.2025	REVISED & REISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB
A	09.07.2025	ISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER डाईग नम्बर	REV
TOLUENE COLUMN	टोल्यूनि कॉलम	B957-303-80-42-DS-3006	B
ITEM NO. 303-CC-00-3603	आइटम नम्बर 303-सीसी-00-3603	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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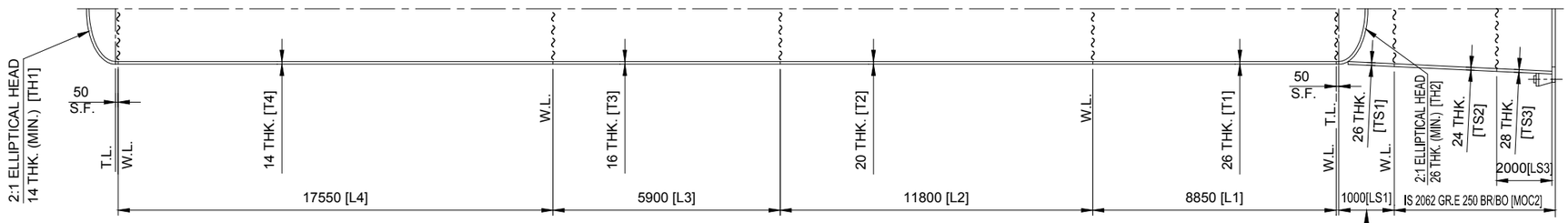
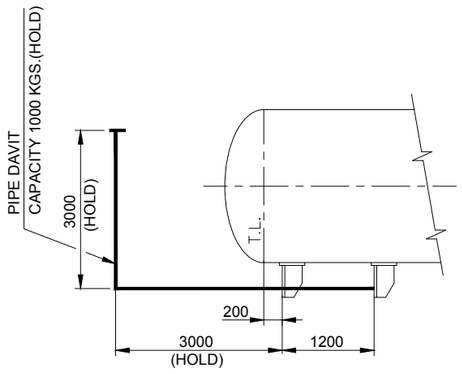
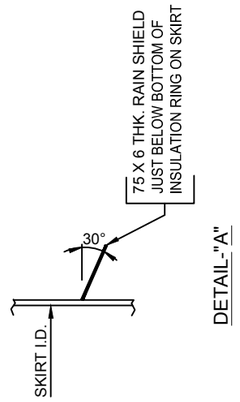
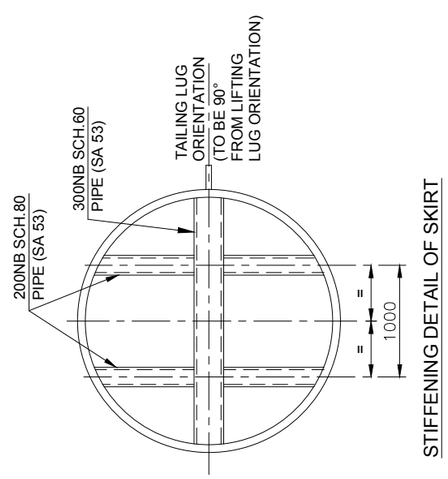




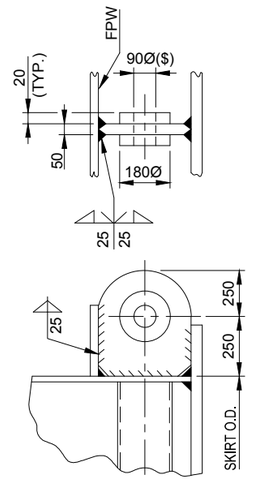
PIPE DAVIT
(ALL OTHER DIMENSIONS AS PER EIL STD.)



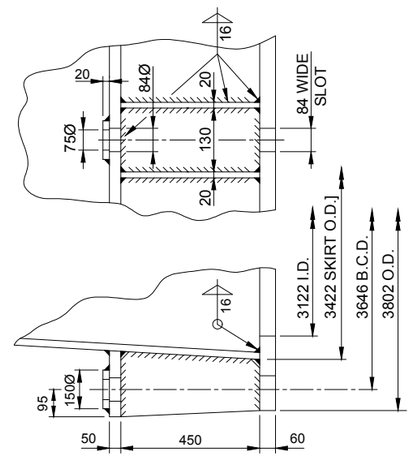
DETAIL-"A"



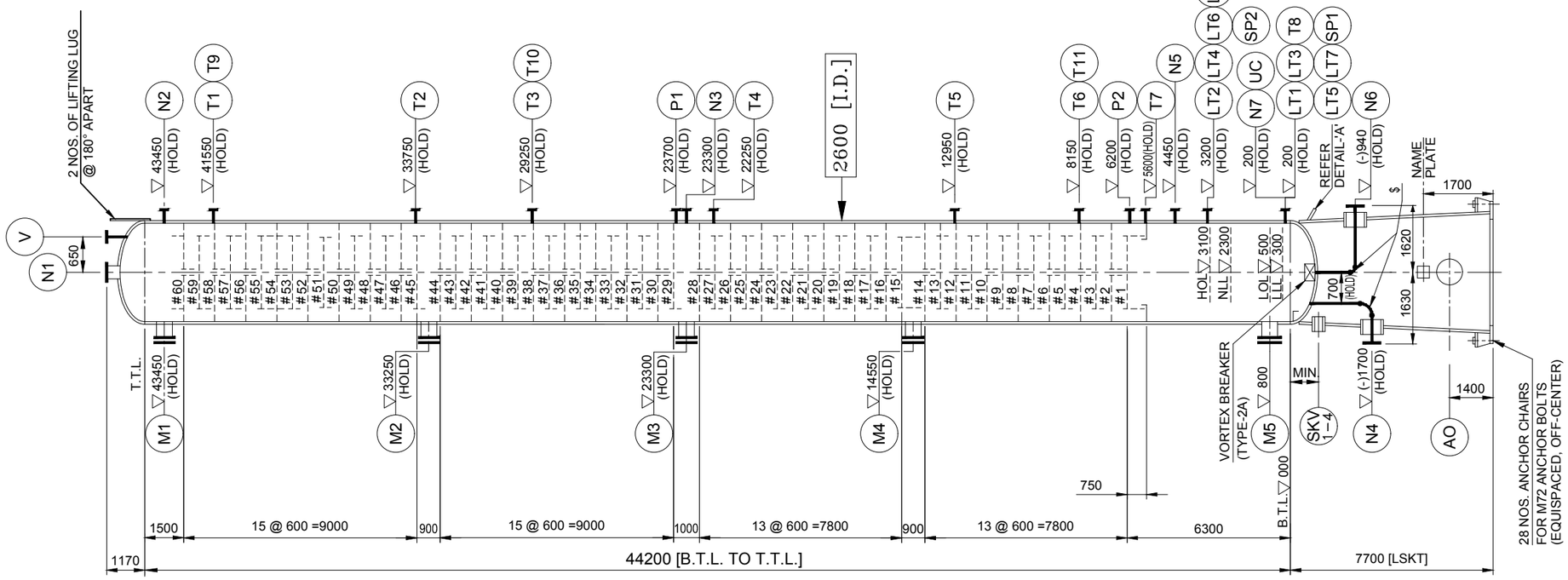
STIFFENING DETAIL OF SKIRT



TAILING LUG DETAIL
$ VENDOR TO ENSURE ADEQUACY OF HOLE DIA.



SKIRT BASE DETAIL(HOLD)
(ALL OTHER DETAILS AS PER EIL STD.)



$ - 90° L.R. ELBOW. SIZE & SHEDULE SAME AS RESPECTIVE NOZZLE NECK.

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	30.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	
A	09.07.2025	ISSUED FOR BIDS/ENGG.	ROHIT	CRG/VIVEK	PB	

VESSEL DESIGN DATA
TOLUENE COLUMN
ITEM NO. 303-CC-00-3603

वेसल डिजाइन डाटा
टोल्यूनि कॉलम
आइटम नम्बर 303-सीसी-00-3603

DRAWING NO. B957-303-80-42-DS-3006 REV. B

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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P0S REV. 0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्ल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	400	14 THK.	150	WN	RF	SEE DWG.	200 X T	VAPOR OUTLET
N2	1	50	160	300	WN	RF	920	-	REFLUX
N3	1	200	80	300	WN	RF	980	110 X T	HYDROCARBON FEED
N4	1	250 (H)	80	300	WN	RF	SEE DWG.	135XT	FEED TO REBOILER
N5	1	400 (H)	14 THK.	150	WN	RF	1050	200 X T	REBOILER RETURN
N6	1	50	160	300	WN	RF	SEE DWG.	-	BOTTOM LIQUID OUTLET
N7	1	50(H)	160	300	WN	RF	950	-	MINIMUM FLOW CIRCULATION
M 1-5	5	600	14 THK.	150	WN	RF	1050	300 X T	MANWAY
LT 1-2	2	50(H)	160	300	WN	RF	950	-	LEVEL TRANSMITTER (DP)
LT 3-4	2	50(H)	160	300	WN	RF	950	-	LEVEL TRANSMITTER (DP)
LT 5-6	2	50(H)	160	300	WN	RF	950	-	LEVEL TRANSMITTER (DP)
LT 7-8	2	50(H)	160	300	WN	RF	950	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50(H)	160	300	WN	RF	950	-	LEVEL GAUGE MAGNETIC (SS)
P 1-2	2	50(H)	160	300	WN	RF	950	-	PI CONNECTION
UC	1	50	160	300	WN	RF	950	-	STEAM OUT
T 1-8	8	50(H)	160	300	WN	RF	950	-	TI CONNECTION
T 9-10	2	50(H)	160	300	WN	RF	950	-	TDC CONNECTION
T11	1	50(H)	160	300	WN	RF	950	-	TIC CONNECTION
V	1	50	160	300	WN	RF	SEE DWG.	40xT	VENT
SKV 1-3	3	100	40	AS PER STANDARD					SKIRT VENT
AO	1	500	14 THK.	AS PER STANDARD					ACCESS OPENING

'T' DENOTES CORRESPONDING SHELL/DISH END/SKIRT NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडेशन लोडिगं डाटा (आपरेटिंग कनडिशन) (HOLD)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	300000	11500
	-	-
WIND	640000	23500

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, SHOP PRIMER & FINSH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH MANHOLE.
14 VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºc.
15 VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT AND CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
16 VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
17 AT TOP, MAXIMUM PRESSURE DROP OF 0.6 KG/SQ.CM & LIQUID LEVEL OF 8220 MM DUE TO LIQUID OVERFILL CASE (I.E. TOTAL 4.7 KG/SQ.CM (g)) IS CONSIDERED FOR MECHANICAL DESIGN.
18 EQUIPMENT MAY BE ERECTED IN SINGLE PIECE IN DRESSED UP CONDITION (BY OTHERS). DRESSED UP IMPLIES THAT THE EQUIPMENT WILL BE ERECTED AFTER INSTALLATION OF INSULATION, PLATFORM/LADDERS ETC. (BY OTHERS). CORRESPONDINGLY EQUIPMENT VENDOR SHALL SELECT LIFTING LUG BASED ON 1.25 TIMES THE ACTUAL ERECTION WEIGHT.
19 COLUMN SHALL BE FIRST COMPLETELY FABRICATED & HYDROTESTED AT SHOP. THEREAFTER IT SHALL BE CUT INTO MAXIMUM TWO SECTIONS (PROVIDE ADDITIONAL LENGTH TO TAKE CARE OF CUTTING & REJOINING ALLOWANCES) BEFORE TRANSPORTATION FROM SHOP TO SITE (WHERE FINAL C-SEAM SHALL BE CARRIED OUT). SECTION LENGTH OF COLUMN SHALL BE DECIDED BASED ON TRANSPORTATION FEASIBILITY (BY VENDOR). COLUMN SHALL BE ASSEMBLED AT SITE IN HORIZONTAL POSITION COMPLETE IN ALL RESPECTS. DP EXAMINATION SHALL BE CARRIED OUT ON SITE JOINT FOR ROOT RUN & FINAL RUNS (INSIDE & OUTSIDE) BY COLUMN FABRICATOR.100% RADIOGRAPHY SHALL BE CARRIED OUT ON SITE JOINT BY COLUMN FABRICATOR. NDT SHALL BE CARRIED OUT AS PER MDS. ONLY LOCAL BOX TYPE (INSIDE) HYDROTEST SHALL BE CARRIED OUT FOR SITE CIRC. SEAM. COMPLETE HYDROTEST OF THE ENTIRE COLUMN AT SITE IS NOT
20 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
21 (B) COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
X	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	-
	LADDERS/PLATFORM CLEATS	-
	PIPE SUPPORT CLEATS	-
	TRAY SUPPORT AND BOLTING BARS	-
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010
	PROCESS DATASHEET	-
	INTERNALS DETAIL (FEED PIPE / DIST.)	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS	X	TRAY SUPPORT/BOLTING BARS
	STIFFENING DETAILS OF NOZZLE	X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	TOP 0.5 BOTT. 1.1
DESIGN PRESSURE	(kg/cm^2g)	INT. 3.5 (NOTE-17) EXT. -
WORKING TEMPERATURE	(°C)	TOP 153.5-153.8 BOTT. 190.8-195.9
DESIGN TEMPERATURE	(°C)	250
MDMT	(°C)	1.1
CORROSION ALLLOWANCE	(MM)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		(B) YES (NOTE-21)
HEAT TREATMENT		AS PER CODE/SPEC.
OPERATING MEDIUM		-
SP. GRAVITY		0.73
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	68.4
PAINTING/CLEANING		AS PER JOB SPECIFICATION(NOTE-12)
INSULATION THICKNESS (mm) (IH)		65 [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[X] YES [ ] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)		4.55
INSPECTION BY		[X] EIL [ ] CIB [ ] TPIA

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)
(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD/INSERT PLATE	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES/SR/LWN	-
NOZZLE FLANGES/SRWN/LWN	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 Gr.B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234Gr.WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS-304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS-304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 Gr.B7/SA 194 Gr.2H
INTERNAL STUDS/BOLTS/NUTS	SS304
SKIRT/ ~~SUPPORT~~	SA 516 Gr.70 / IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 Gr. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 Gr.70 / SA 106 Gr.B
INTERNAL PARTS (BOLTED)	SA 516 Gr.70 / SS 410S
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70 / IS 2062 Gr.E250 QUALITY BR/B0 WELDED OVER BQCS PAD
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 Gr.70 / IS 2062 GR. E 250 QUALITY BR/BO
PIPE DAVIT	SA 106 Gr. B
VACUUM STIFFENER	-
LIFTING LUG	SA 516 Gr.70
TAILING LUG	IS2062 GR.E250 QUALITY BR/B0

`@ INTERNAL GASKET SHALL BE SUITABLE FOR DESIGN TEMP, AND OPERATIING LIQUID

U-CODE STAMPED
SITE ASSEMBLED COLUMN

SPECIAL SERVICE : (B) **AROMATIC / BENZENE SERVICE**

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)
DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन) (HOLD)

ERECTION	84500	OPERATING	160000
HYDROTEST(SHOP)	153000	HYDROTEST (FIELD)	193000
NUMBER OF ITEMS :	ONE		

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	30.10.2025	REVISED & REISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB
A	16.07.2025	ISSUED FOR BIDS / ENGG.	ROHIT	CRG/VIVEK	PB

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
XYLENE COLUMN	जाइलीन कॉलम	B957-303-80-42-DS-3007	B
ITEM NO. 303-CC-00-3604	आइटम नम्बर 303-सीसी-00-3604	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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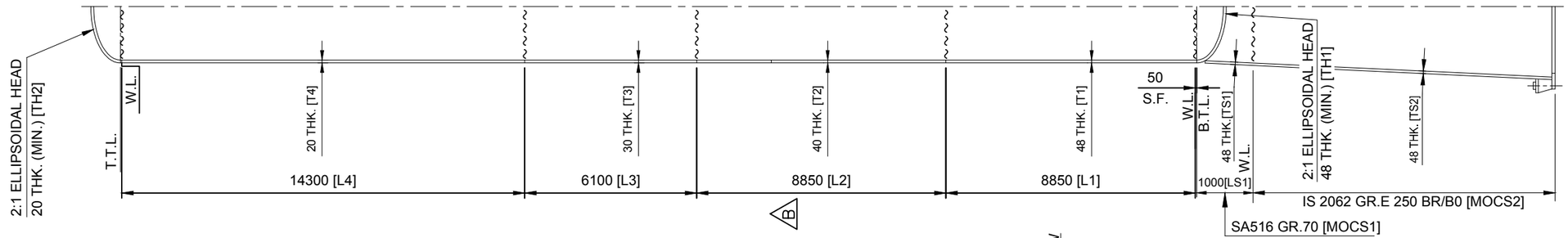
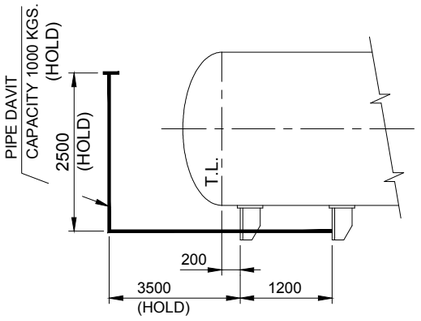
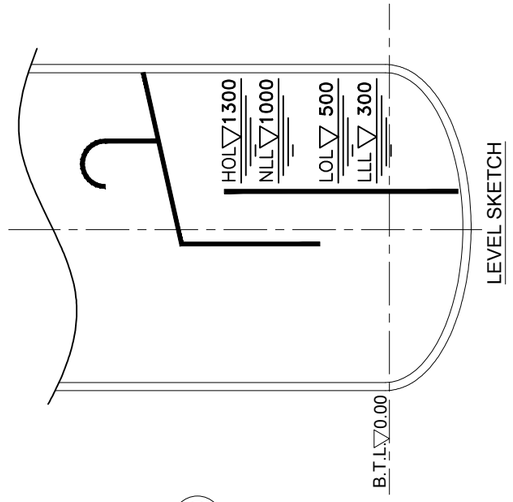
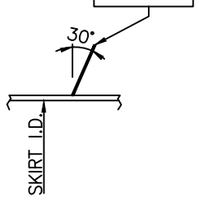


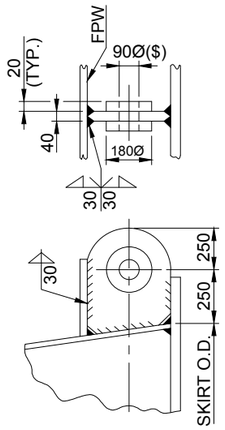


PIPE DAVIT
(ALL OTHER DIMENSIONS AS PER EIL STD.)



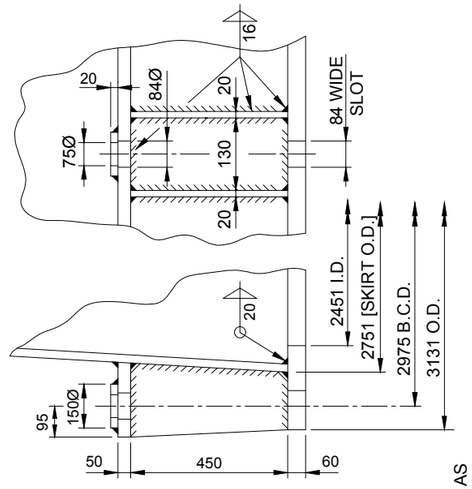
LEVEL SKETCH



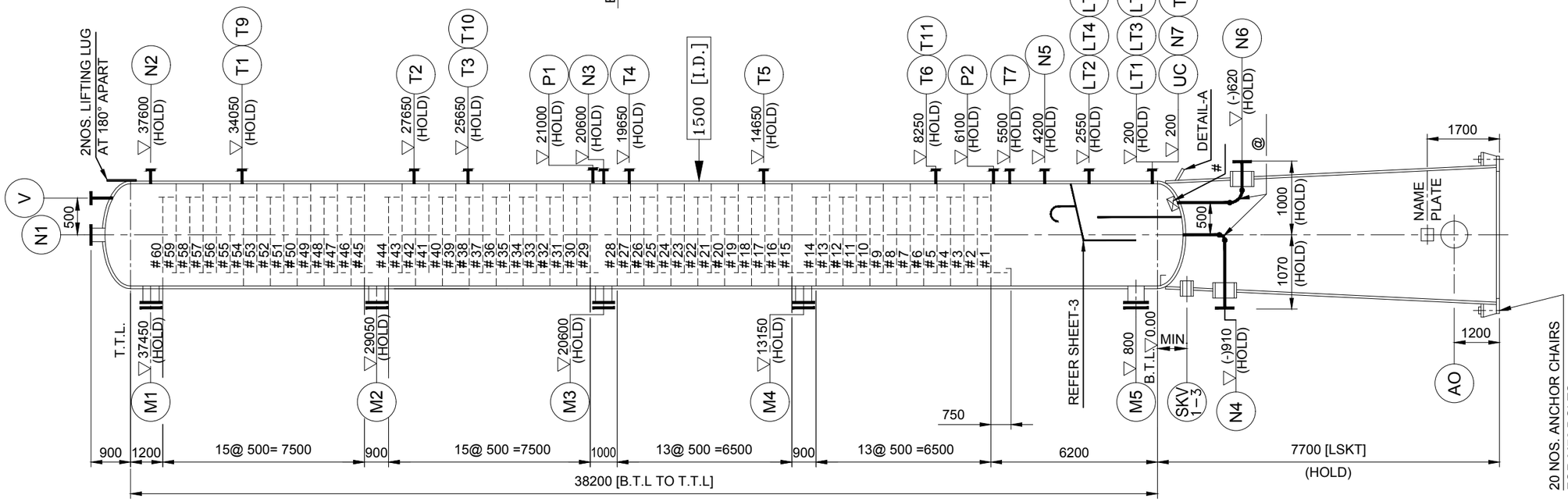


DETAIL-"A"

TAILING LUG DETAIL
$ VENDOR TO ENSURE ADEQUACY OF HOLE DIA.



SKIRT BASE DETAIL (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	30.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	SK/SM	PB	
A	16.07.2025	ISSUED FOR BIDS/ENGG.	ROHIT	SK/SM	PB	

VESSEL DESIGN DATA
XYLENE COLUMN
ITEM NO. 303-CC-00-3604

वेसल डिजाइन डाटा
जाइलीन कॉलम
आइटम नम्बर 303-सीसी-00-3604

DRAWING NO. B957-303-80-42-DS-3007 REV. B

SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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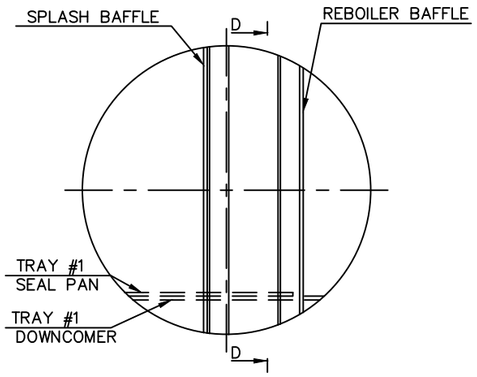
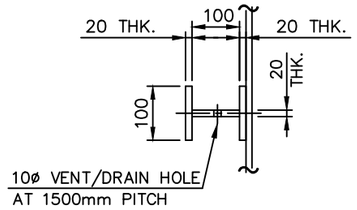
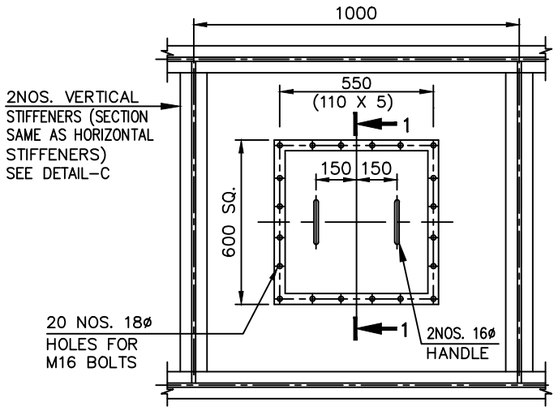
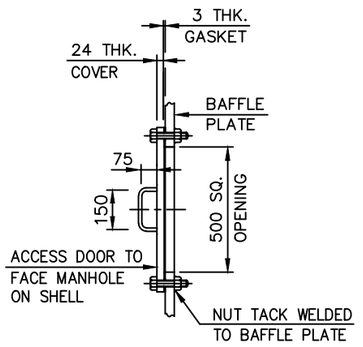




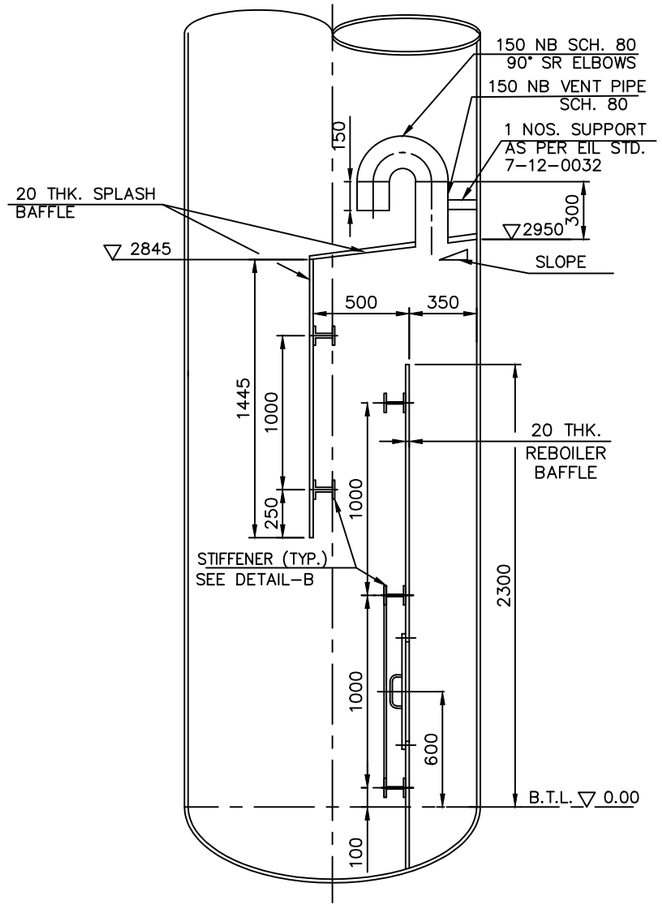
DETAIL–'B'



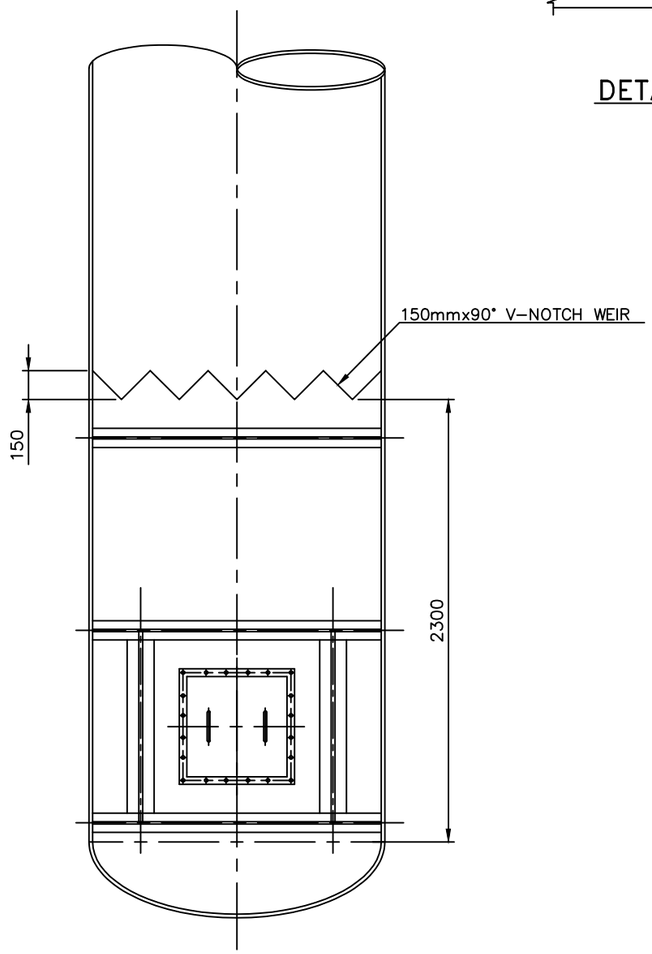
DETAIL OF MANWAY
ON BAFFLE



SECTION 1–1



COLUMN BOTTOM DETAIL



SECTION D–D

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	30.10.2025	REVISED & REISSUED FOR BIDS/ENGG.	ROHIT	CRG./VIVEK	PB	
A	16.07.2025	ISSUED FOR BIDS/ENGG.	AS	CRG./VIVEK	PB	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

VESSEL DESIGN DATA	वेसल डिजाइन डाटा
XYLENE COLUMN	जाइलीन कॉलम
ITEM NO. 303-CC-00-3604	आइटम नम्बर 303-सीसी-00-3604

DRAWING NO.	REV.
B957–303–80–42–DS–3007	B
SHEET 3 OF 3	

1–1641–0503 REV.0 A3–420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
N1	1	200/250	80	150	WN	RF	1620	115xT	HC INLET+REDUCING FLANGE+BOLTING (NOTE-15)
N2	1	150	80	150	WN	RF	1420	70xT	HC OUTLET
N3	1	50	160	300	WN	RF	1620	-	N2 INLET/VAPOR OUTLET
N4	1	50	160	300	WN	RF	SEE DWG.	-	WATER OUTLET (BOOT)
N5	1	80	160	300	WN	RF	1620	40xT	HC MIN FLOW LINE (NOTE-16)
N6	1	50	160	300	WN	RF	1620	-	EQUALIZING LINE
N7	1	25	XXS	300	WN	RF	SEE DWG.	-	WATER PUMP MIN FLOW LINE
LT 1-8	8	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL TRANSMITTER (GWR)-INT
LT 9-16	8	50 (H)	160	300	WN	RF	1130	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL GAUGE (MAG)-INT
LG 3-4	2	50 (H)	160	300	WN	RF	1130	-	LEVEL GAUGE (MAG)
M 1-2	2	600	12 THK.	150	WN	RF	SEE DWG.	300xT	MANWAY + BF + GASKET + BOLTING + DAVIT
UC	1	50	160	300	WN	RF	SEE DWG.	45xT	STEAM OUT
V1	1	150	80	150	WN	RF	1620	70xT	PSV CONNECTION
V2	1	150	80	150	WN	RF	1620	70xT	VENTILATION (NOTE-14)
P1	1	50	160	300	WN	RF	1620	-	PI PRESSURE INSTRUMENT
V2A	1	50	160	300	WN	RF	SEE DWG.	-	VENT (NOTE-14)

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION लाईसन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) फॉऊंडशन लोडिगं डाटा (आपरेटिंग कनडिशन)		
TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM HORIZONTAL PLANE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM VERTICAL PLANETO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
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9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH NEAREST MANHOLE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºc WITH VESSEL OPEN
14. BLANKED OFF VENTILATION NOZZLE (V2) PROVIDED AT TOP OF VESSEL. 2" VESSEL VENT NOZZLE TO BE WELDED TO THE VENTILATION NOZZLE BLIND FLANGE.
15. PROVIDE AT NOZZLE N1, DIP PIPE OF 8'' FROM INCH 10'' NOZZLE WITH CLOSE END 200MM FROM THE BOTTOM AND HAVING 4 HOLES 100 MM WIDTH X 200 MM HIGH ON SIDE, FACING TOWARDS HEAD.
16. PROVIDE AT NOZZLE N5, DIP PIPE WITH CLOSE END 200MM FROM THE BOTTOM AND HAVING 4 HOLES 50 MM WIDTH X 100 MM HIGH ON SIDE, FACING TOWARDS HEAD.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
X	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	
X	PROCESS DATA SHEET	B957-303-79-41-DS-1202

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT 1-16, LG1-4)
	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	0.25
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. --
WORKING TEMPERATURE (°C)	55
DESIGN TEMPERATURE (°C)	150
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	HYDROCARBON (H/C) + WATER
SP. GRAVITY	0.7133
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	31.8
PAINTING/CLEANING	AS PER JOB SPECIFICATION (NOTE-11)
INSULATION THICKNESS (mm) (IH)	NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL ~~/ VERTICAL (AT TOP)~~
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	☒ EIL ☐ CIB ☒ TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.70
REINFORCEMENT PAD / INSERT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT~~/ SUPPORT	SA 516 GR.70
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/SA 106 GR.B
INTERNAL PARTS (BOLTED)	SA 516 GR.70/SA 106 GR.B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY B
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	-

@ INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

ASME U-CODE STAMPED

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	10500	OPERATING	29000
HYDROTEST(SHOP)	42300	HYDROTEST (FIELD)	45300
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB
A	11.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
EDC OVHD RECEIVER	ईडीसी ओवीएचडी रीसीवर	B957-303-80-42-DS-3102	B
ITEM NO. 303-VV-HI-3502	आइटम नम्बर 303-वीवी-एचआइ-3502	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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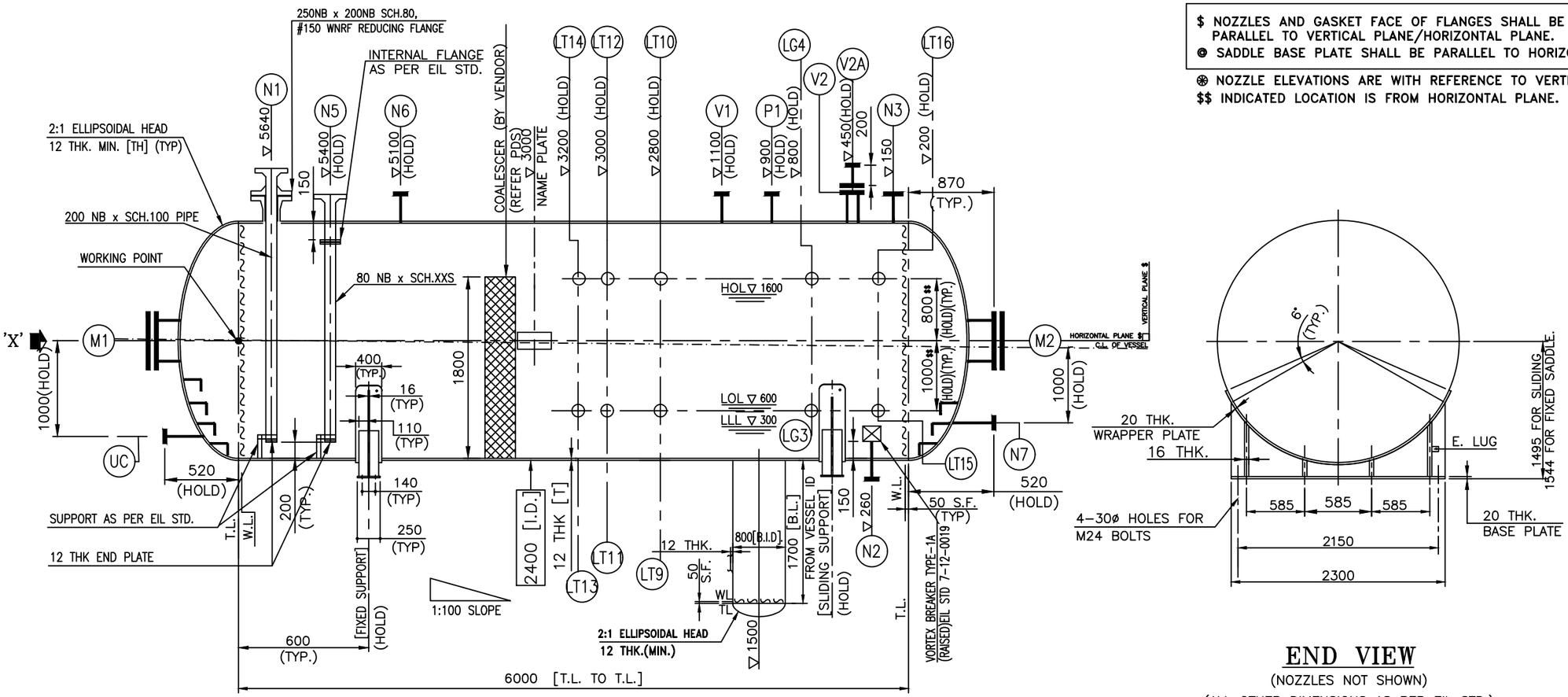
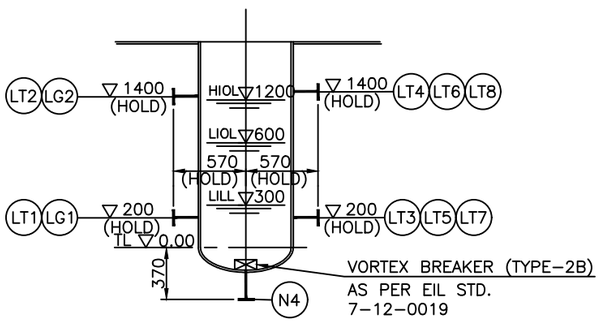
$ NOZZLES AND GASKET FACE OF FLANGES SHALL BE PARALLEL TO VERTICAL PLANE/HORIZONTAL PLANE.
◎ SADDLE BASE PLATE SHALL BE PARALLEL TO HORIZONTAL PLANE.
⊛ NOZZLE ELEVATIONS ARE WITH REFERENCE TO VERTICAL PLANE.
$$ INDICATED LOCATION IS FROM HORIZONTAL PLANE.

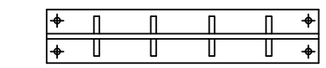




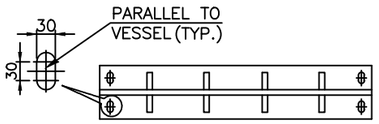
BOOT DETAIL

END VIEW

(NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



HOLES FOR FIXED SUPPORT



HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	
A	11.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
EDC OVHD RECEIVER
ITEM NO. 303-VV-HI-3502

वेसेल डिजाइन डाटा
ईडीसी ओवीएचडी रीसीवर
आइटम नम्बर 303-वीवी-एचआइ-3502

DRAWING NO. B957-303-80-42-DS-3102
REV. B
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	150	80	300	WN	RF	880	85XT	CONDENSATE INLET
N2	1	50	160	600	WN	RF	SEE DWG.	-	EQUALIZING LINE
N3	1	150	80	300	WN	RF	SEE DWG.	85X T	CONDENATE OUTLET
LT 1-2	2	50 (H)	160	300	WN	RF	830	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50 (H)	160	300	WN	RF	830	-	LEVEL GAUGE MAGENTIC (SS)
V	1	50	160	600	WN	RF	SEE DWG.	-	VENT
M	1	600	14 THK.	300	WN	RF	980	300X T	MANHOLE + BF + GASKET + BOLTING
P1	1	50	160	600	WN	RF	SEE DWG.	-	PI PRESSURE INSTRUMENT
UC	1	50	160	600	WN	RF	830	-	UTILITY CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लोडिगं डाटा (आपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 900 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER CODE & IBR AND MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & AI AND ALSO GET THE EQPT. INSPECTED BY CIB & AI.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR & CODE REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD.
17. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
18. HYDROTEST SHALL BE CARRIED OUT AS PER IBR & CODE REQUIREMENTS.
19. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईंग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
	SKETCH FOR MONKEY LADDER	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT-1-2, LG1-2)
X	NOZZLE ELEVATIONS (LT1-2 , LG1-2)		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	INSULATION THICKNESS		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR & ASME SEC. VIII DIV.I ED.2023
WORKING PRESSURE (kg/cm²g)	16
DESIGN PRESSURE (kg/cm²g)	INT. 22 EXT. F.V
WORKING TEMPERATURE (°C)	203.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	YES (NOTE-19)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	MP CONDENSATE
SP. GRAVITY	0.8606
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	3
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR & CODE
INSPECTION BY	[ ] EIL [X] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 GR.70
REINFORCEMENT PAD	SA 516 GR.70
HEADS	SA 516 GR.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 GR.70
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT~~/ SUPPORT	SA 106 GR. B
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR /B0
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	-
VACUUM STIFFENER	-
LIFTING LUG	SA 516 GR.70

ASME U-CODE STAMPED

NO PIPING, PLATFORM AND LADDER CLIPS TO BE ATTACHED ON VESSEL

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

X	**INDIAN BOILER REGULATIONS (IBR)**
	DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	3400	OPERATING	5000
HYDROTEST(SHOP)	6400	HYDROTEST (FIELD)	6600
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	08.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA

EDC REBOILER CONDENSATE POT

ITEM NO. 303-VV-VW-3503

डिजाइन डाटा

ईडीसी रीबॉयलर कन्डैसेट पॉट

आइटम नम्बर 303-वीवी-वीडब्ल्यू-3503

DRAWING NUMBER
डाईंग नम्बर
B957-303-80-42-DS-3103 REV A

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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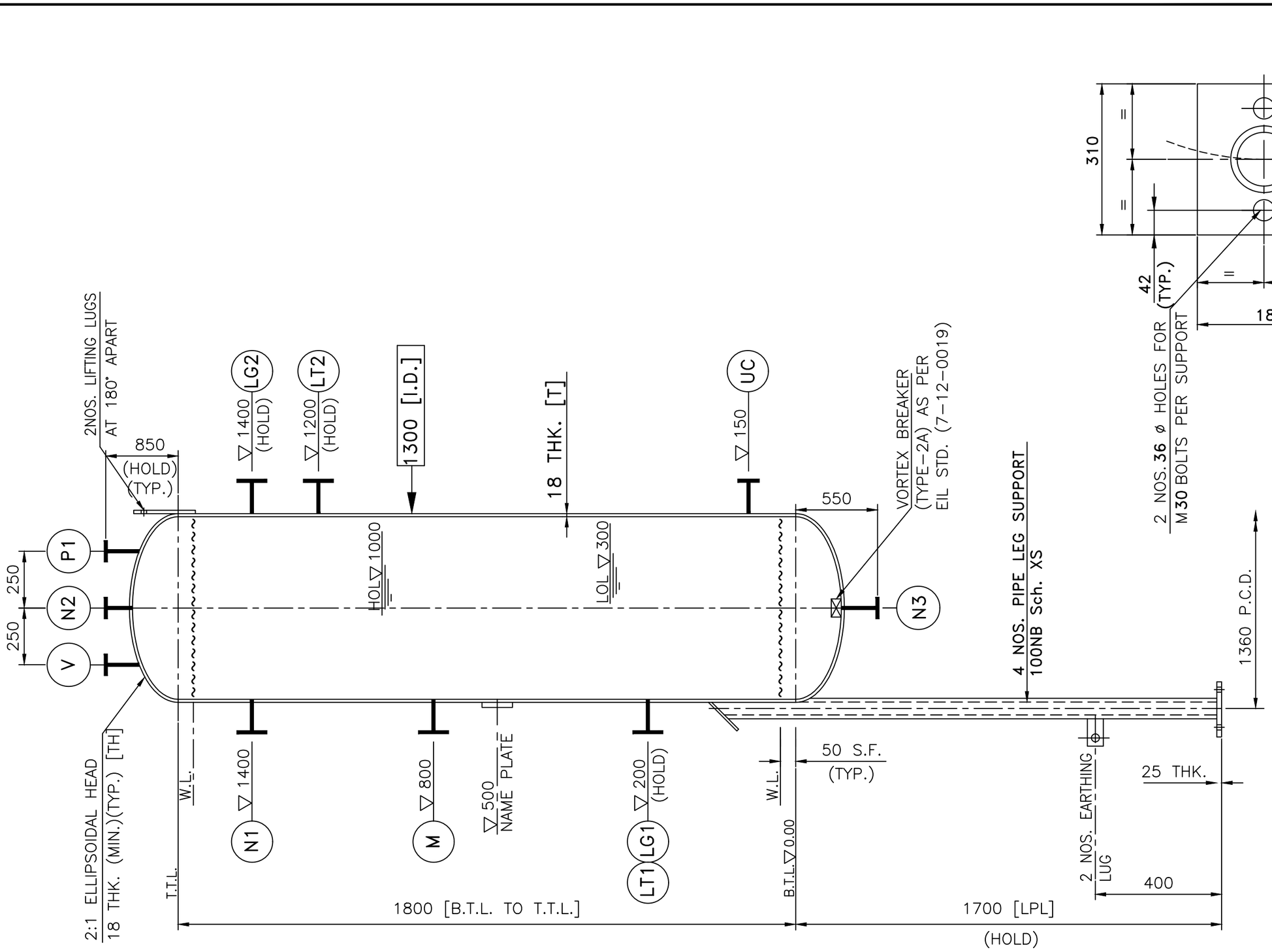

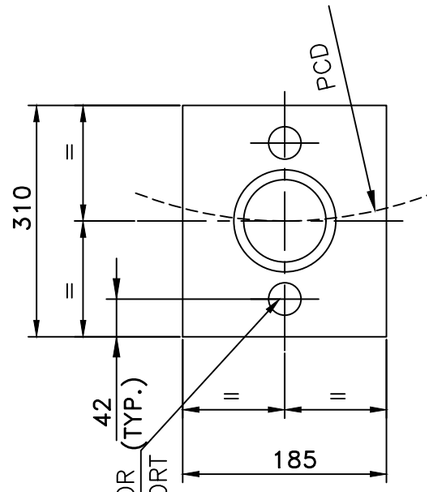

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

A	08.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB		
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
EDC REBOILER CONDENSATE POT
ITEM NO. 303-VV-VW-3503

वेसेल डिजाइन डाटा
ईडीसी रीबॉयलर कन्डैसेट पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3503

DRAWING NO. B957-303-80-42-DS-3103 | REV. A

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
N1	1	150	80	300	WN	RF	830	85XT	CONDENSATE INLET
N2	1	50	160	600	WN	RF	SEE DWG.	-	EQUALIZING LINE
N3	1	150	80	300	WN	RF	SEE DWG.	85X T	CONDENATE OUTLET
LT 1-2	2	50 (H)	160	300	WN	RF	780	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50 (H)	160	300	WN	RF	780	-	LEVEL GAUGE MAGNETIC (SS)
V	1	50	160	600	WN	RF	SEE DWG.	-	VENT
M	1	500	14 THK.	300	WN	RF	880	250X T	MANWAY + BF + GASKET + BOLTING
P1	1	50	160	600	WN	RF	SEE DWG.	-	PI PRESSURE INSTRUMENT
UC	1	50	160	600	WN	RF	780	-	UTILITY CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊंडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 900 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER CODE & IBR AND MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & AI AND ALSO GET THE EQPT. INSPECTED BY CIB & AI.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR & CODE REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD.
17. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
18. HYDROTEST SHALL BE CARRIED OUT AS PER IBR & CODE REQUIREMENTS.
19. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROFFING AND INSULATION SUPPORT	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-2, LG1-2)
X	NOZZLE ELEVATIONS LT1-2, LG1-2		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	INSULATION THICKNESS		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR & ASME SEC. VIII DIV.I ED.2023
WORKING PRESSURE (kg/cm²g)	16
DESIGN PRESSURE (kg/cm²g)	INT. 22 EXT. F.V
WORKING TEMPERATURE (°C)	203.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	YES (NOTE-19)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	MP CONDENSATE
SP. GRAVITY	0.8606
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	2.5
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [X] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR & CODE
INSPECTION BY	[ ] EIL [X] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्सैन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 GR.70
REINFORCEMENT PAD	SA 516 GR.70
HEADS	SA 516 GR.70
SHELL FLANGES/SR	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 GR.70
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT~~/PIPE SUPPORT	SA 106 GR. B
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	-
VACUUM STIFFENER	-
LIFTING LUG	SA 516 GR.70

ASME U-STAMPED

PIPE, PLATFORM & LADDER CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

X	INDIAN BOILER REGULATIONS (IBR)
	DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	2600	OPERATING	4000
HYDROTEST(SHOP)	5100	HYDROTEST (FIELD)	5400
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	05.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा
SRC REBOILER CONDENSATE POT	एसआरसी रीबॉयलर कन्डैसेट पॉट
ITEM NO. 303-VV-VW-3505	आइटम नम्बर 303-वीवी-वीडब्ल्यू-3505

DRAWING NUMBER / डाईग नम्बर: B957-303-80-42-DS-3105 REV: A

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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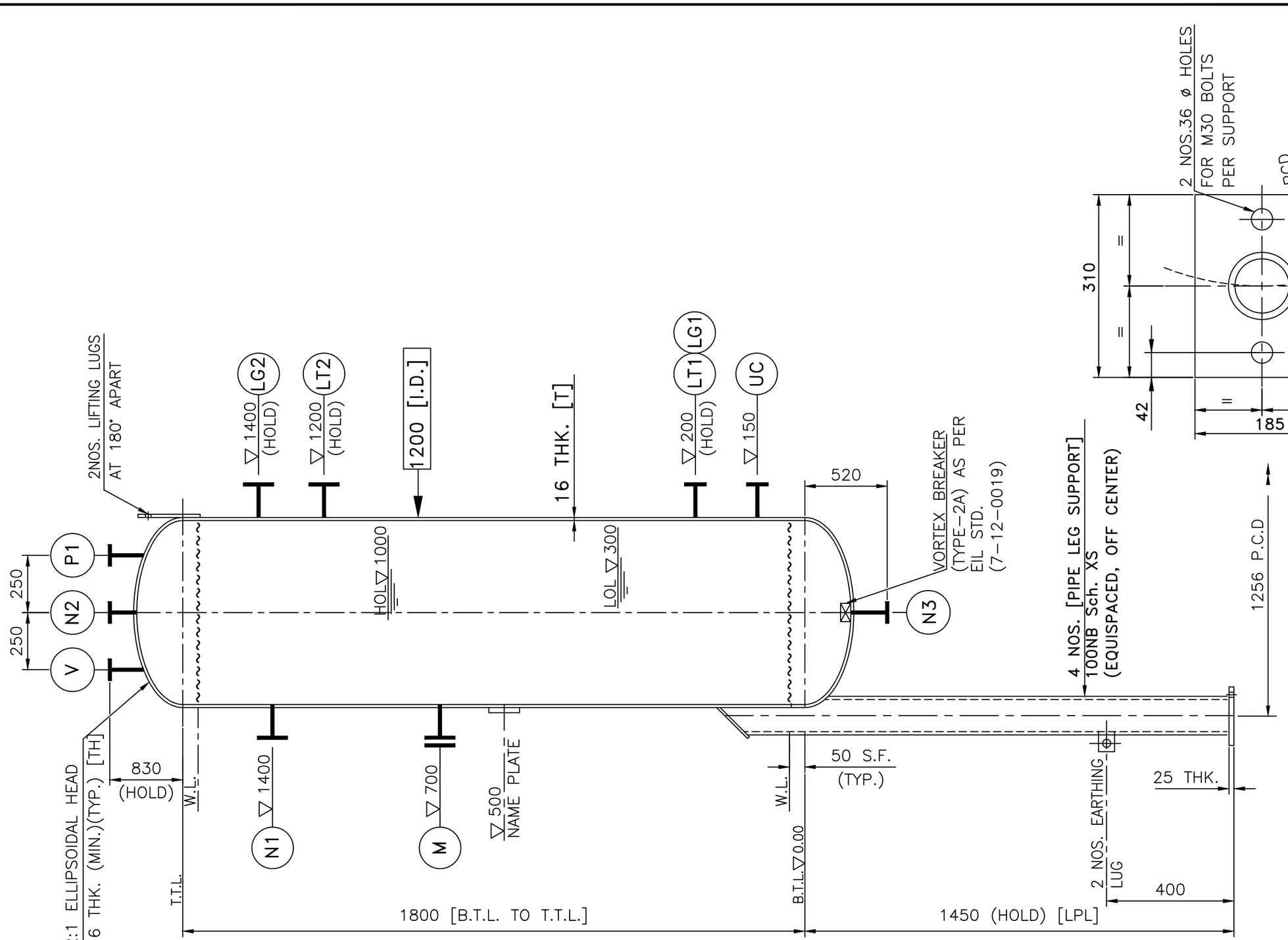

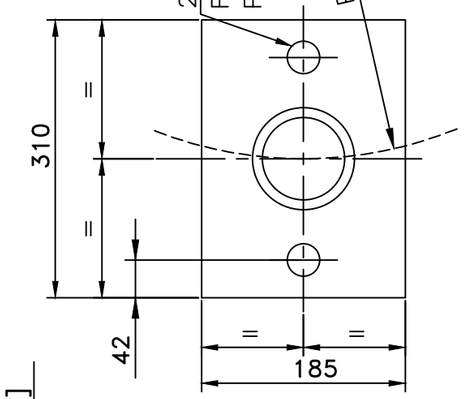

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	05.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SRIKANTH	PB	

VESSEL DESIGN DATA
SRC REBOILER CONDENSATE POT
ITEM NO. 303-VV-VW-3505

वेसेल डिजाइन डाटा
एसआरसी रीबॉयलर कन्डैसेट पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3505

DRAWING NO.	REV.
B957-303-80-42-DS-3105	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
N1	1	50	160	300	WN	RF	1570	-	SOLVENT INLET
N2	1	50	160	300	WN	RF	1570	-	SOLVENT INLET
N3	1	50	160	300	WN	RF	1570	-	WATER INLET
N4	1	600	16 THK.	150	WN	RF	SEE DWG.	300xT	STRIPPING STEAM OUT
N5	1	600	16 THK.	150	WN	RF	1670	255xT	STRIPPING STEAM IN (NOTE-16)
N6	1	800	16 THK.	150	WN	RF	1800	350xT	REBOILER BUNDLE
N7	1	100	120	300	WN	RF	SEE DWG.	60xT	DRAIN TO COLLECTION SYSTEM
LT 1-2	2	50 (H)	160	300	WN	RF	1570	-	LEVEL TRANSMITTER (GWR)
SP 1-2	2	50 (H)	160	300	WN	RF	1570	-	STAND PIPE
P1	1	50	160	300	WN	RF	1570	-	PI PRESSURE INSTRUMENT
T1	1	50	160	300	WN	RF	1570	-	TI PRESSURE INSTRUMENT
V1	1	250	80	300	WN	RF	1620	115xT	PSV CONNECTION
V2	1	50	160	300	WN	RF	SEE DWG.	-	VENT
M1-M2	2	600	16 THK.	150	WN	RF	1670	255xT	MANWAY + BF + DAVIT+ GASKET+ BOLTING
UC	1	50	160	300	WN	RF	1570	-	STEAM OUT
SKV 1-4	4	100	40	AS PER STANDARD				-	SKIRT VENT
AO	1	500 I.D.	14 THK.	AS PER STANDARD				250xT	ACCESS OPENING

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION) (HOLD)
फॉऊंडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	190000	16000
WIND	110500	9500

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH NEAREST MANHOLE.
13. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
14. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
15. PROVIDE ELECTRICAL TRACING (BY OTHERS) ON THE BELOW LEVEL OF STAB-IN REBOILER. ELECTRICAL TRACING TO BE DESIGNED FOR 100ºC PROCESS TEMPERATURE.
16. VENDOR TO DESIGN AND PROVIDE TAILING LUG (AT 90° TO LIFTING LUGS) AND BRACING ARRANGEMENT CONSIDERING AN IMPACT FACTOR OF 1.5. ANY MODIFICATION (IF REQUIRED DUE TO DESIGN OF TAILING LUG) ENVISAGED IN TAILING LUG, BRACING AND BASE BLOCK SHALL BE CARRIED OUT BY VENDOR. COST OF THE SAME SHALL BE INCLUDED IN BASE PRICE. DETAILS PROVIDED IN THE MDS ARE MINIMUM TO BE FOLLOWED.
17. NOZZLE N7 TO BE INCLUDED ON HEATING CIRCUIT.
18. T1 LOCATION BETWEEN LLL AND TOP HX TUBE BUNDLE.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
X	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
X	INLET DEFLECTOR BAFFLE	7-12-0020
X	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
X	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
X	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	-
X	PROCESS DATASHEET	B957-303-79-41-DS-1206
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-2, SP1-2)
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
		X	PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	-0.05
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. FV
WORKING TEMPERATURE (°C)	175
DESIGN TEMPERATURE (°C)	250
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	SOLVENT/WATER/STEAM
SP. GRAVITY	1.1393
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	42.7
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11
INSULATION THICKNESS (mm) (IH)	50 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	[X] EIL [ ] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB (SEAMLESS)
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	@
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
SKIRT/ ~~SUPPORT~~	SA 516 GR.70 / IS 2062 GR. E 250 QUALITY BR/B0
SKIRT/~~SUPPORT~~ BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70
WRAPPER PLATE	-
DEMISTER/GRID	410SS
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
LIFTING LUG	SA 516 GR.70

@ INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING LIQUID.

ASME U-CODE STAMPED

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	23000	OPERATING	90000
HYDROTEST(SHOP)	65700	HYDROTEST (FIELD)	110000
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	16.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
SOLVENT REGENERATOR	साल्वन्ट रिजेनरेटर	B957-303-80-42-DS-3106	A
ITEM NO. 303-VV-VI-3506	आइटम नम्बर 303-वीवी-वीआई-3506	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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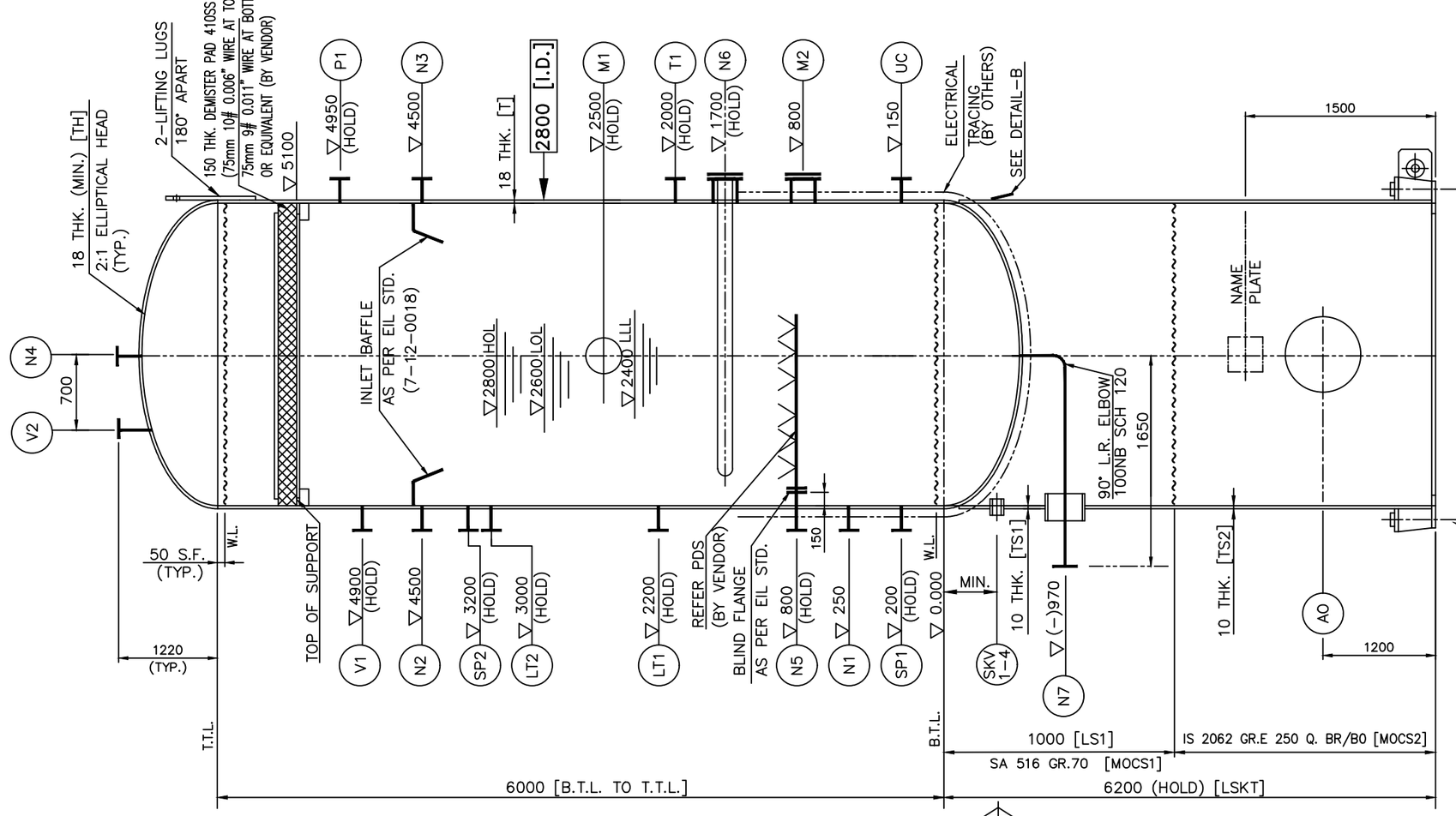
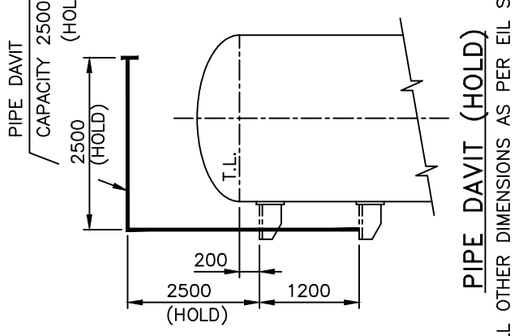


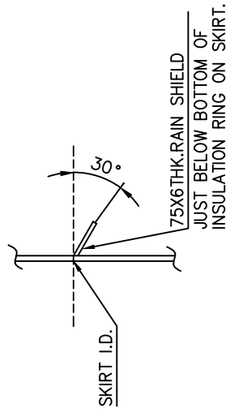
TAILING LUG DETAIL

($) VENDOR TO ENSURE THE ADEQUACY OF HOLE DIA.

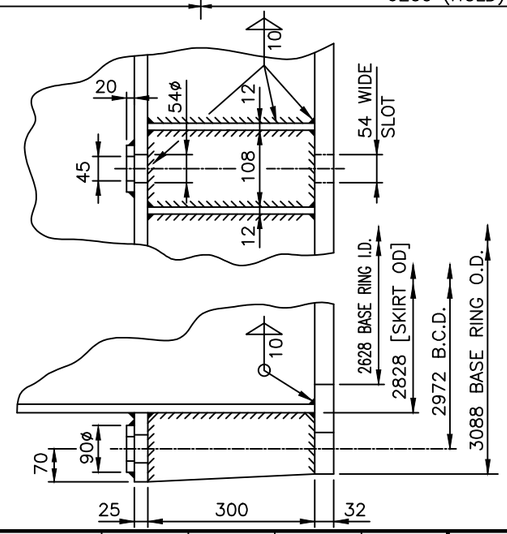


PIPE DAVIT (HOLD)

(ALL OTHER DIMENSIONS AS PER EIL STD.)

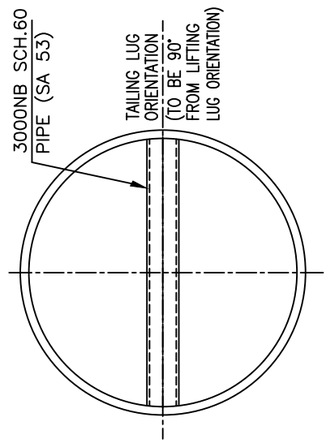


DETAIL - B



SKIRT BASE DETAIL (HOLD)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



STIFFENING DETAIL OF SKIRT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	16.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
SOLVENT REGENERATOR
ITEM NO. 303-VV-VI-3506

वेसल डिजाइन डाटा
साल्वन्ट रिजेनरेटर
आइटम नम्बर 303-वीवी-वीआई-3506

DRAWING NO.	REV.
B957-303-80-42-DS-3106	A
SHEET 2 OF 3	

1-1641-0503 REV.0 A3-420x297

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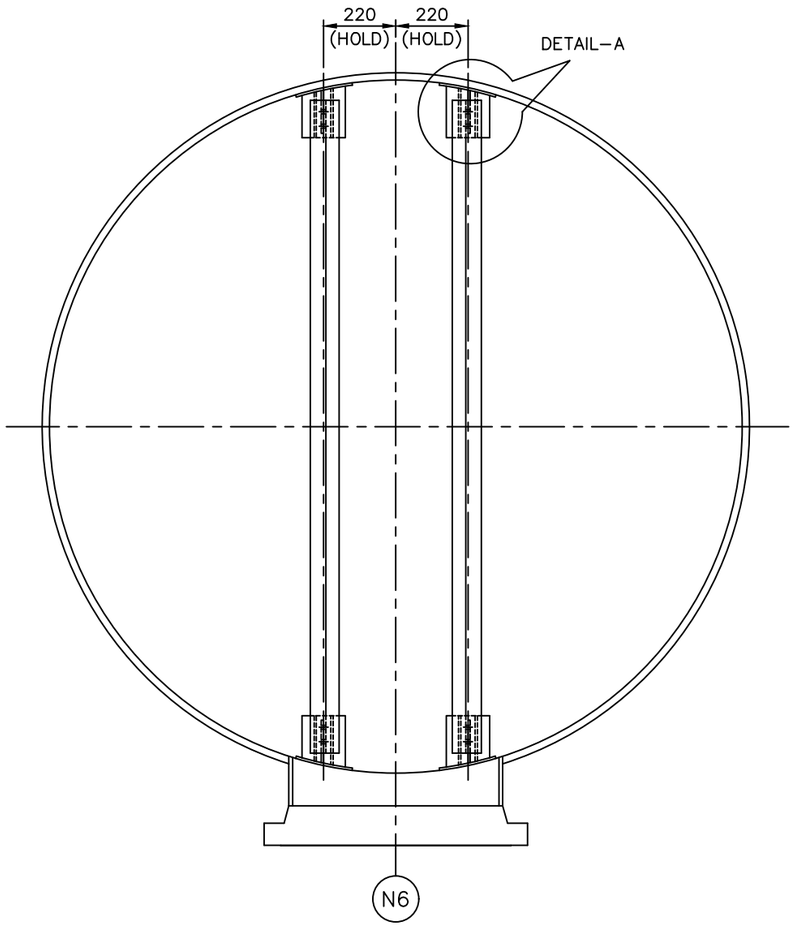
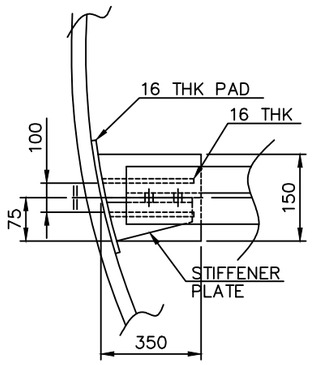
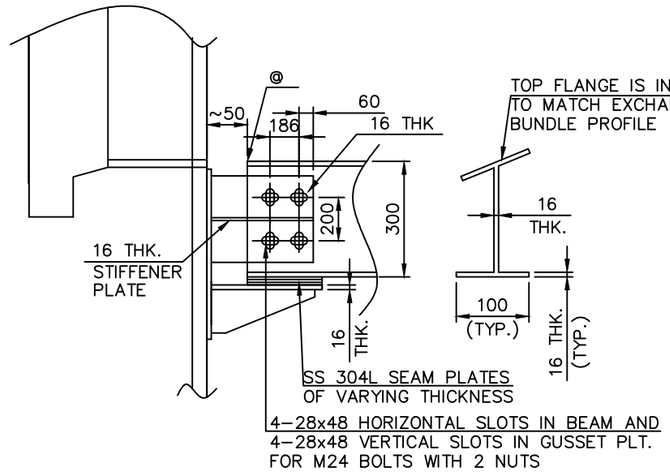
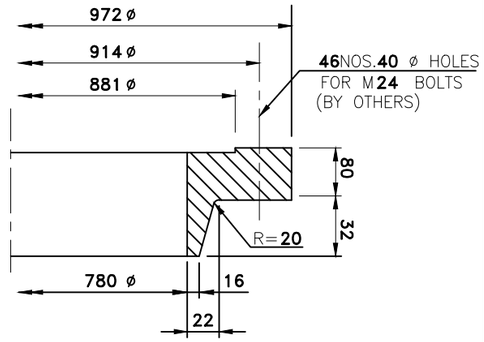






TOP FLANGE IS INCLINED
TO MATCH EXCHANGER
BUNDLE PROFILE

DETAIL–A



DETAIL OF NOZZLE –N6

@ BEAM TOP TO FLUSH WITH NOZZLE ID AT AN OFFSET OF 220mm (HOLD)

BEAM SUPPORT FOR STUB–IN REBOILER CONNECTION SHALL BE PROVIDED BY VENDOR. CONSIDERING WEIGHT OF EXCHANGER AS 3500 kgs. DEFLECTION OF BEAM SHALL BE RESTRICTED TO 3mm.

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	16.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
SOLVENT REGENERATOR
ITEM NO. 303-VV-VI-3506

वेसल डिजाइन डाटा
साल्वन्ट रिजेनरेटर
आइटम नम्बर 303–वीवी–वीआई–3506

DRAWING NO.	REV.
B957–303–80–42–DS–3106	A
SHEET 3 OF 3	

1–1641–0503 REV.0 A3–420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	50	160	600	WN	RF	520	-	CONDENSATE INLET
N2	1	50	160	600	WN	RF	SEE DWG.	-	EQUALIZING LINE
N3	1	50	160	600	WN	RF	SEE DWG.	-	CONDENSATE OUTLET
LT 1-2	2	50 (H)	160	300	WN	RF	520	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50 (H)	160	300	WN	RF	520	-	LEVEL GAUGE MAGNETIC (SS)
V	1	50	160	600	WN	RF	SEE DWG.	-	VENT
H 1-2	2	200 (H)	80	300	WN	RF	570	110xT	HANDHOLE + BF +HINGE + GASKET + BOLTING
P1	1	50	160	300	WN	RF	SEE DWG.	-	PI PRESSURE INSTRUMENT
UC	1	50	160	600	WN	RF	520	-	UTILITY CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)(HOLD)
फॉऊडेशन लाडिंगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER CODE & IBR AND MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & AI AND ALSO GET THE EQPT. INSPECTED BY CIB & AI.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR & CODE REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD.
17. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
18. HYDROTEST SHALL BE CARRIED OUT AS PER IBR & CODE REQUIREMENTS.
19. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
X	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	
PIPE SUPPORT CLEATS	
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	-

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-2, LG1-2 & H1-2)
X	NOZZLE ELEVATIONS (LT1-2, LG1-2)		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR & ASME SEC. VIII DIV.I ED.2023
WORKING PRESSURE (kg/cm²g)	16
DESIGN PRESSURE (kg/cm²g)	INT. 22 EXT. FV
WORKING TEMPERATURE (°C)	203.5
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	YES (NOTE-19)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	MP CONDENSATE
SP. GRAVITY	0.8606
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M³)	0.51
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm) (IC)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR & CODE
INSPECTION BY	[ ] EIL [X] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 GR.70
REINFORCEMENT PAD	SA 516 GR.70
HEADS	SA 516 GR.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR.B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT~~/SUPPORT	SA 106 GR.B
~~SKIRT~~/SUPPRT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
LIFTING LUG	SA 516 GR.70

ASME U STAMPED

NO PIPING, PLATFORM AND LADDER CLIPS TO BE ATTACHED ON VESSEL

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	1100	OPERATING	1400
HYDROTEST(SHOP)	1610	HYDROTEST (FIELD)	1640
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	05.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
SOLVENT REGENERATOR REBOILER CONDENSATE POT	साल्वन्ट रिजेनरेटर रेबोइलर कन्डेन्सेट पॉट	B957-303-80-42-DS-3107	A
ITEM NO. 303-VV-VW-3507	आइटम नम्बर 303–वीवी–वीडब्ल्यू–3507	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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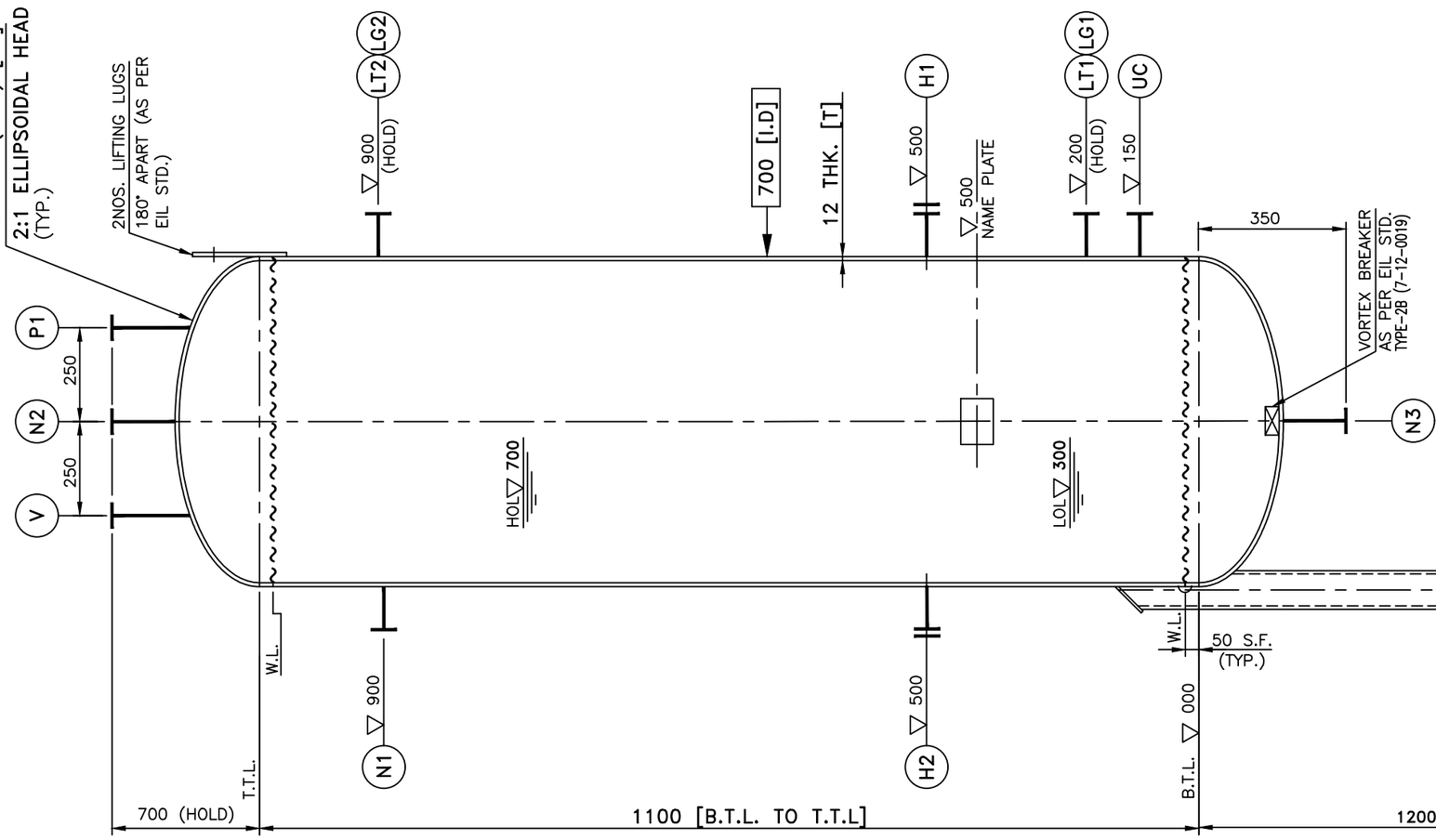

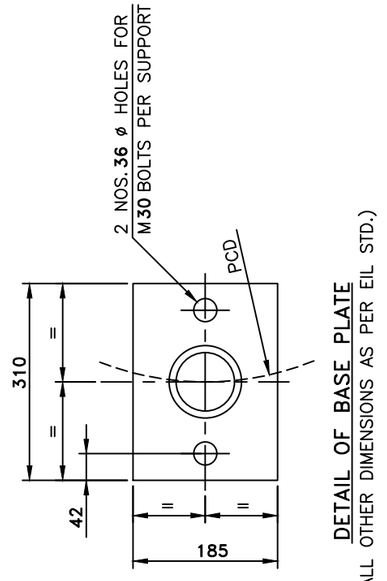

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	04.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
SOLVENT REGENERATOR
REBOILER CONDENSATE
POT
ITEM NO. 303-VV-VW-3507

वेसेल डिजाइन डाटा
साल्वन्ट रिजेनरेटर
रेबोइलर कन्डेन्सेट
पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3507

DRAWING NO.	REV.
B957-303-80-42-DS-3107	A
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेशन	पैड	सर्विस
N1	1	50	160	300	WN	RF	1160	-	SRC WATER INLET
N2	1	50	160	300	WN	RF	1160	-	BFW INLET
N3	1	50	160	300	WN	RF	1160	-	BENZENE WATER INLET
N4	1	25	XXS	300	WN	RF	1160	-	MIN FLOW LINE
N5	1	50	160	300	WN	RF	SEE DWG	-	N2 INLET/VAPOR OUTLET
N6	1	80	160	300	WN	RF	SEE DWG	45xT	WATER OUTLET
N7	1	50	160	300	WN	RF	1160	-	SAMPLE
LT 1-8	8	50 (H)	160	300	WN	RF	1160	-	LEVEL TRANSMITTER (DP)
SP 1-2	2	50 (H)	160	300	WN	RF	1160	-	STAND PIPE
T	1	50	160	300	WN	RF	1160	-	TI TEMPERATURE INSTRUMENT
M	1	600	8 THK.	150	WN	RF	1310	255xT	MANWAY + BF + GASKET + BOLTING + DAVIT
UC	1	50	160	300	WN	RF	1160	-	STEAM OUT
V1	1	100	120	300	WN	RF	SEE DWG	60xT	PSV CONNECTION
V2	1	50	160	300	WN	RF	SEE DWG	-	VENT
P1	1	50	160	300	WN	RF	1160	-	PI PRESSURE INSTRUMENT
SKV 1-4	4	100	40	AS PER EIL STD.				-	SKIRT VENT
AO 1	1	500 I.D.	14 THK.	AS PER EIL STD.				250X T	ACCESS OPENING

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊंडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	12100	2500
WIND	3600	1050

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VENDOR SHALL PROVIDE 2 NOS. PERMANENT SLOPING STEEL MONKEY LADDERS INSIDE THE SKIRT TO ACCESS THE BOTTOM HEAD FOR INSPECTION.
13. EQUIPMENT SHALL BE SUBJECT TO STEAMOUT AT 0.5KG/CM2 @ 190°C WITH VESSEL OPEN.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
X	SKIRT BASE DETAILS	7-12-0004
X	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE
X	SKETCH FOR MONKEY LADDER	B957-000-80-42-SK-0010

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-8 & SP1-2)
X	NOZZLE ELEVATIONS (AS MARKED)	X	PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE			ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm^2g)	0.5		
DESIGN PRESSURE (kg/cm^2g)	INT. 3.5	EXT.	--
WORKING TEMPERATURE (°C)	40.2		
DESIGN TEMPERATURE (°C)	150		
MDMT (°C)	1.1		
CORROSION ALLOWANCE (mm)	3		
TYPE OF HEAD	2:1 ELLIPTICAL		
JOINT EFFICIENCY	SHELL 0.85	HEAD	1
RADIOGRAPHY	SHELL SPOT	HEAD	FULL
POST WELD HEAT TREATMENT	AS PER CODE / SPEC.		
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.		
OPERATING MEDIUM	PROCESS WATER		
SP. GRAVITY	0.9891		
WIND SPECIFICATION	IS-875 (PART-3)		
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)		
CAPACITY (M^3)	13.8		
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11)		
INSULATION THICKNESS (mm) (IH)	NIL ☐ HOT ☐ COLD		
FIRE PROOFING CLEATS	☒ YES ☐ NO		
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL		(AT TOP)
PRESSURE (NEW & COLD)	4.55		
INSPECTION BY	☒ EIL ☐ CIB ☒ TPIA/AI		

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
SKIRT/ ~~SUPPORT~~	SA 516 GR.70/IS 2062 GR.E250 QUALITY BR/B0
SKIRT/ ~~SUPPORT~~ BASE	IS 2062 GR.E250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	B SA 516 GR.70/ IS 2062 GR. E 250 QUALITY B
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

ASME U-CODE STAMPED

SPECIAL SERVICE :

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	7000	OPERATING	22500
HYDROTEST(SHOP)	20800	HYDROTEST (FIELD)	26800
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB
A	09.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
WATER SURGE DRUM	वाटर सर्ज ड्रम	B957-303-80-42-DS-3108	B
ITEM NO. 303-VV-VW-3508	आइटम नम्बर 303-वीवी-वीडब्ल्यू-3508	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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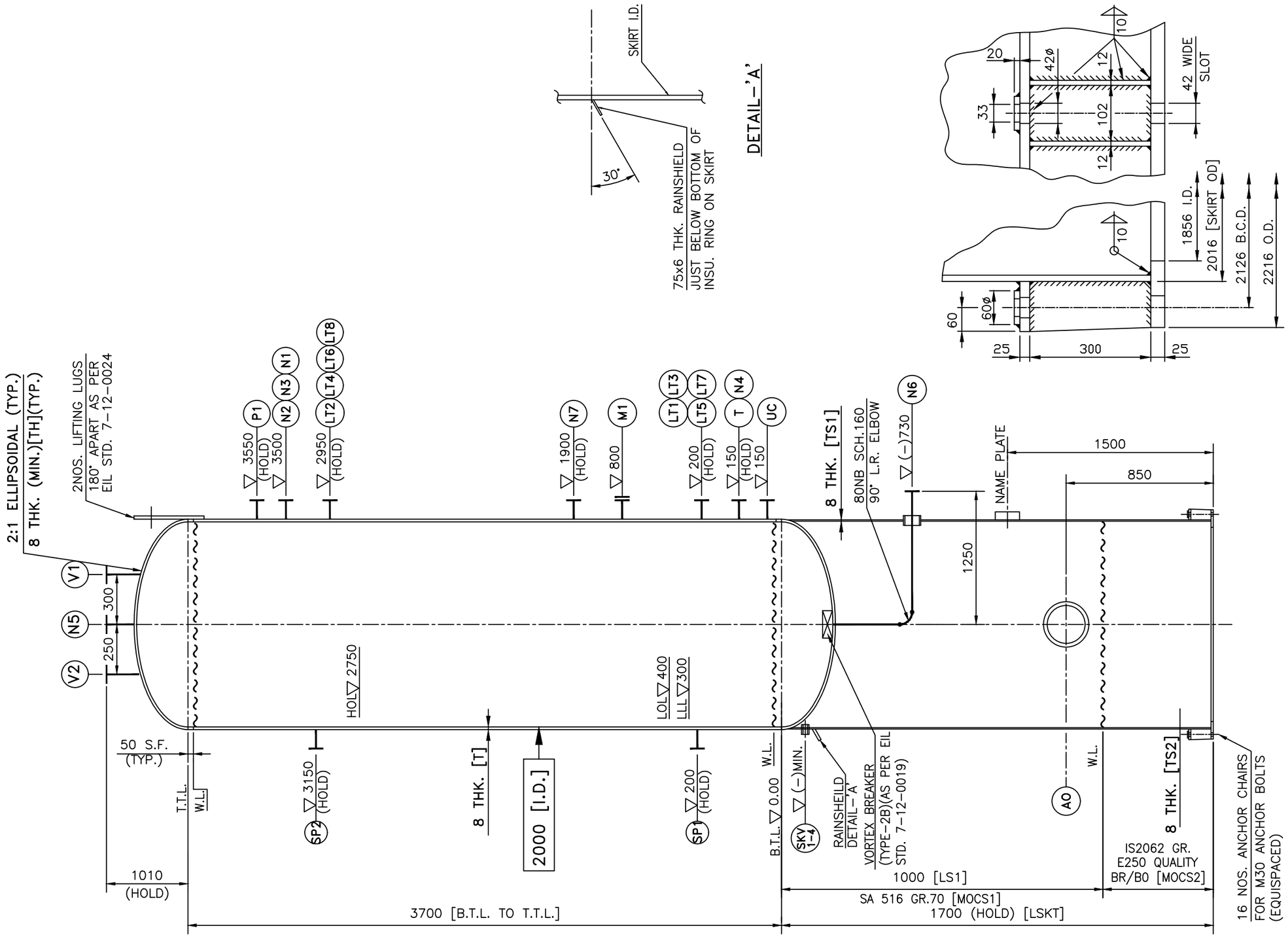

SKIRT BASE DETAIL
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	
A	09.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
WATER SURGE DRUM
ITEM NO. 303-VV-VW-3508

वेसेल डिजाइन डाटा
वाटर सर्ज ड्रम
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3508

DRAWING NO.	REV.
B957-303-80-42-DS-3108	B
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS B957-303-79-41-DS-1211 REV.2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS / क्लास	FLANGES TYPE / टाईप	FLANGES FACING / फेसिंग	PROJECTION NOTE-4 / प्रोजेक्शन	PAD W x T / पैड	SERVICE / सॉर्विस
N1	1	150	120	300	WN	RF	SEE DWG.	85X T	HC INLET
N2/ N4	2	100 (H)	BY PUMP VENDOR						HC OUTLET (PUMP CONNECTION)
N3	1	50	160	300	WN	RF	SEE DWG.	-	N2 INLET/EQUALISATION
LT 1-2	2	150 (H)	120	300	WN	RF	SEE DWG.	60XT	LEVEL TRANSMITTER (RDAR)
T1	1	50	160	300	WN	RF	SEE DWG.	-	TI TEMPERATURE INSTRUMENT
P1	1	50	160	300	WN	RF	SEE DWG.	-	PI PRESSURE INSTRUMENT
M2	1	600	14 THK.	150	WN	RF	SEE DWG.	200 X T	MANWAY+BF+GASKET+BOLTING+HINGE
M1/ M3	1	600 (H)	14 THK.	150	WN	RF	SEE DWG.	200X T	PUMP MOUNT
UC	1	50	160	300	WN	RF	SEE DWG.	-	STEAM OUT
D1	1	50	160	300	WN	RF	SEE DWG.	-	DRAIN CONNECTION
D2	1	50	160	300	WN	RF	SEE DWG.	-	DRAIN
S1	1	600	14 THK.	150	WN	RF	SEE DWG.	200xT	MOUNTING NOZZLE + BF + GASKET + BOLTING FOR PI, UC,TI & N3

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडेशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ~~ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.~~
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES SHALL BE STIFFENED WITH 4 NOS. 100 x 10 THK FLATS AT 90 DEG.APART. MANHOLE,PUMP NOZZLE AND MOUNTING NOZZLES SHALL BE STIFFENED WITH 8 NOS 10THKx R.F PAD WIDE FLATS EQUISPACED.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES / REDUCING FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. THE VESSEL SHALL BE LOCATED IN RCC PIT.
14 (a). SIZE OF SUMP1-2 & NOZZLE M2 & M3 IS UNDER HOLD & SHALL BE AS CONFIRMED BY PUMP VENDOR.
14 (b). PUMP NOZZLE COVER / BLIND FLANGE WITH PUMP ASSEMBLY, NOZZLES N3 & N4, BOLTING & GASKET SHALL BE SUPPLIED BY PUMP SUPPLIER.
15. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED/BOLTED CS INTERNAL SHALL BE 12mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
16. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190 ºC.
17. LIFTING LUG FOR HANDLING OF VESSEL SHALL BE DESIGNED (CONSIDERING IMPACT FACTOR 1.5) AND PROVIDED BY VENDOR. INDICATIVE DETAILS ARE FURNISHED ON SHEET-3.
18. PROVIDE ELECTRIC TRACING AROUND THE VESSEL CONSIDERING SOLVENT FREEZING POINT AT 10°C.
19A (B). ELECTRICAL TRACING (BY OTHERS) INSULATION TO BE APPLIED AROUND THE VESSEL CONSIDERING SOLVENT FREEZING POINT AT 10°C.
19B (B). INSULATION (IE) MATERIAL:
INNER LAYER: ROCK WOOL (IS8183) - 90mm.
OUTER LAYER: POLYISOCYANURATE (PIR) (ASTM C591, GRADE-2 TYPE-II) - 25mm

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	STD. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
X	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038
X	STILL WELL FOR LEVEL TRANSMITTER (RADAR TYPE) FOR BURIED VESSEL	7-12-0039

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	STILL WELL FOR		PIPE DAVIT
X	SUMP DIAMETER, LENGTH		PACKING SUPPORT
X	BURIED HEIGHT		

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	0.1
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. F.V
WORKING TEMPERATURE (°C)	45-175
DESIGN TEMPERATURE (°C)	250
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 0.85 HEAD 1
RADIOGRAPHY	SHELL SPOT HEAD FULL
POST WELD HEAT TREATMENT	AS PER CODE/SPEC.
HEAT TREATMENT	HEAD: AS PER CODE /SPEC.
OPERATING MEDIUM	SOLVENT+HYDROCARBONS+WATER
SP. GRAVITY	1.1404-1.2442
WIND SPECIFICATION	IS 875
SEISMIC	IS 1893 + SITE SPECTRA
CAPACITY (M^3)	65
PAINTING/CLEANING	REFER AS PER JOB SPEC.
INSULATION THICKNESS (mm)(NOTE-19B)	(90+25) (IE) ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	(B) ☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	☒ EIL ☐ CIB ☒ TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL/BOOT	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES / BLIND FLANGE	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
SUPPORT	SA 516 Gr.70
SUPPORT BASE	-
INTERNAL PARTS (WELDED)	SA 516 Gr.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70
WRAPPER PLATE	SA 516 Gr.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
LIFTING LUG	SA 516 Gr.70
STIFFENER	SA 516 Gr.70
STILL WELL FOR LT1 & LT2	SS304L

ASME U-STAMP VESSEL

@ WITHOUT PUMP ASSEMBLY

SPECIAL SERVICE : -

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	25000@	OPERATING	85000@
HYDROTEST(SHOP)	94000@	HYDROTEST (FIELD)	94000@
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	14.01.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB
A	12.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB

DESIGN DATA	डिजाइन डाटा
SOLVENT SUMP	सॉल्वन्ट सम्प
ITEM NO. 303-VV-HW-3511	आइटम नम्बर 303-वीवी-एचडब्ल्यू-3511

DRAWING NUMBER / डाईग नम्बर	REV
B957-303-80-42-DS-3111	B
SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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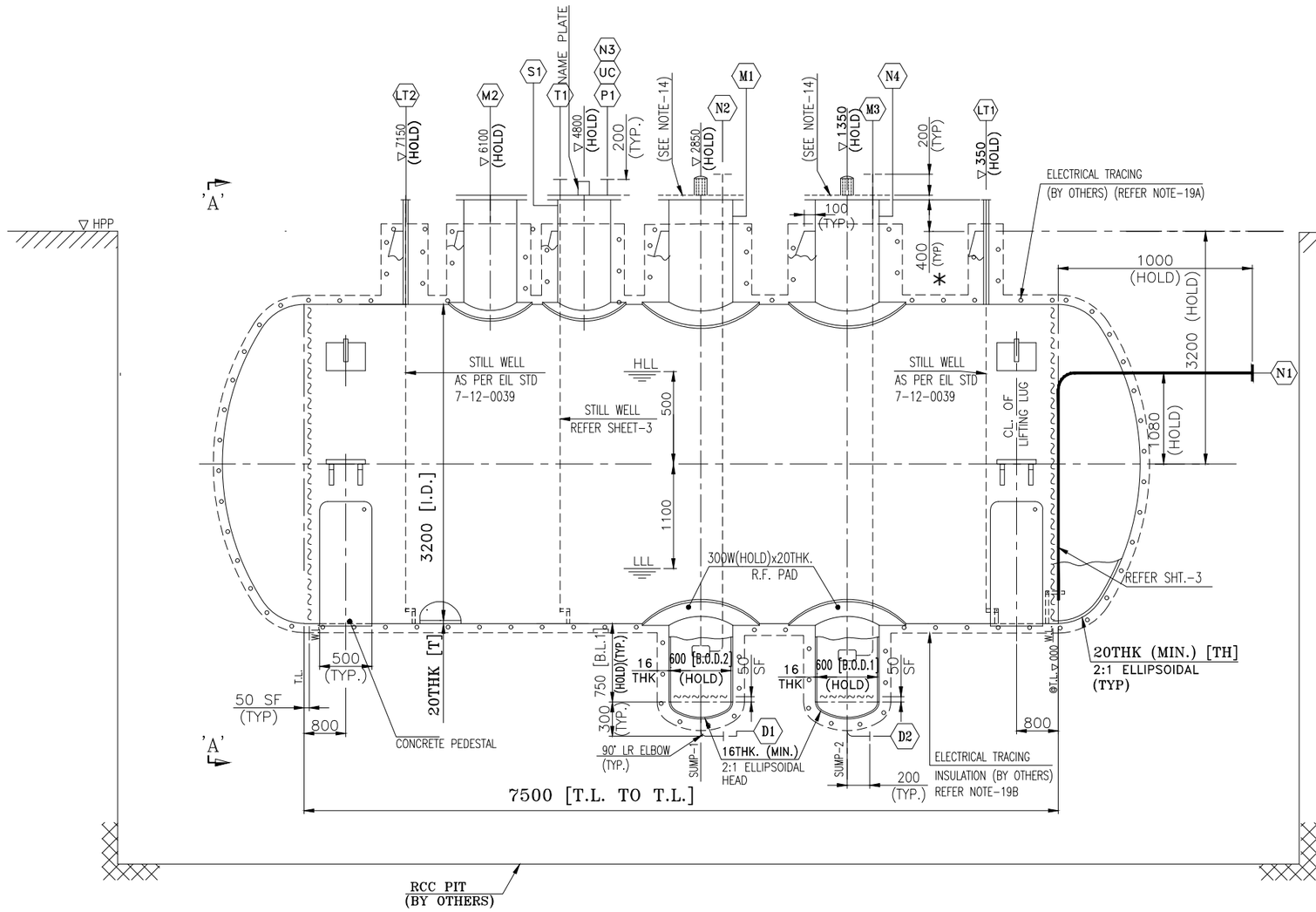

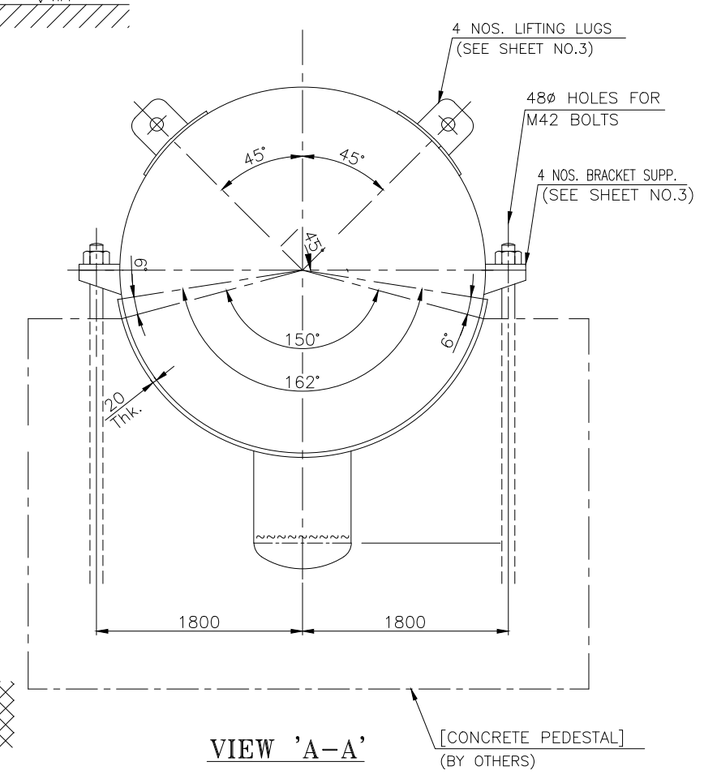

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VESSEL DESIGN DATA
SOLVENT SUMP
ITEM NO. 303-VV-HW-3511

वेसेल डिजाइन डाटा
साल्वन्ट सम्प
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DRAWING NO. B957-303-80-42-DS-3111
REV. B
SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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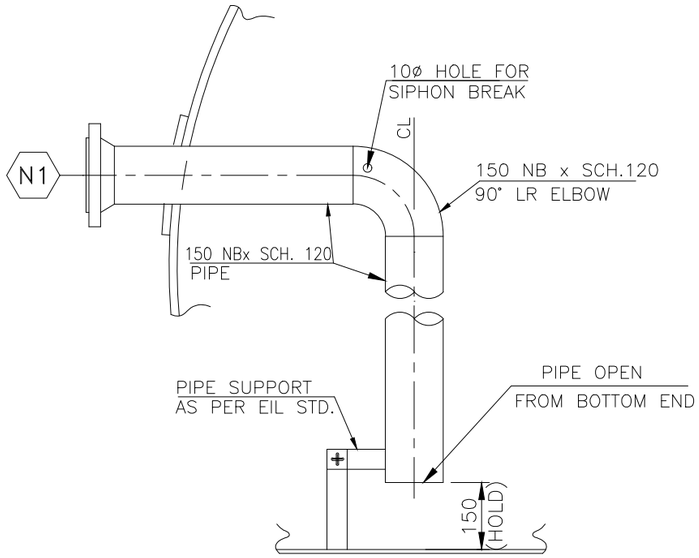
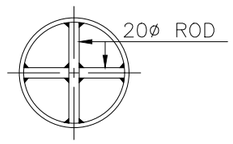
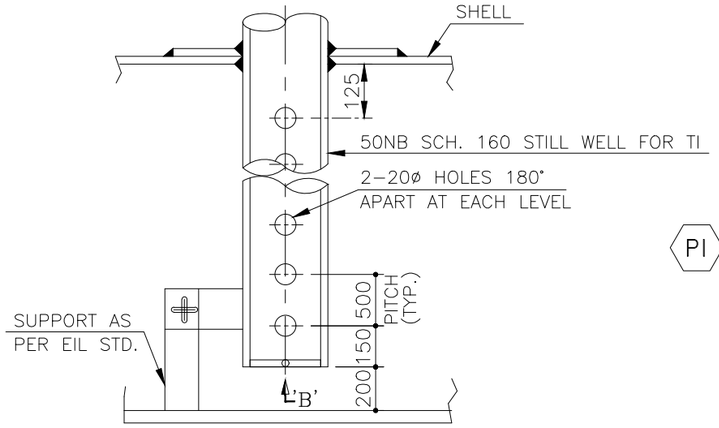


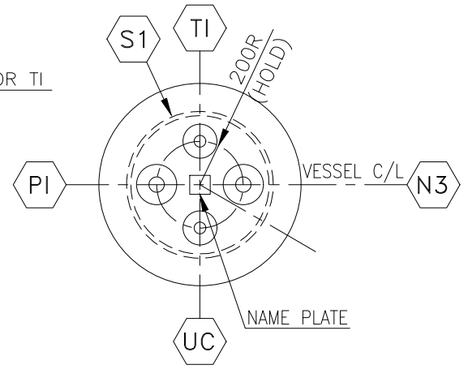
DETAIL OF NOZZLE–N1



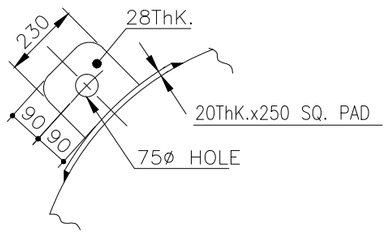
VIEW 'B'
(TYP)



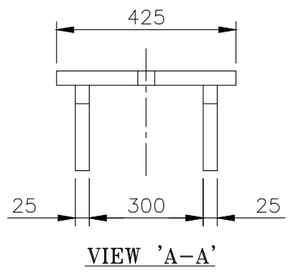
DETAIL OF STILL WELL FOR NOZZLE TI
(HOLD)



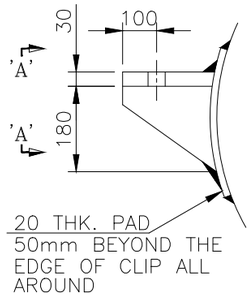
PLAN FOR
MOUNTING NOZZLE S1 (HOLD)
(FOLLOW AS PER NOZZLE ORIENTATION)



DETAIL OF LIFTING LUG (TYP)



VIEW 'A–A'



DETAIL OF BRACKET SUPPORT (TYP)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
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VESSEL DESIGN DATA
SOLVENT SUMP
ITEM NO. 303-VV-HW-3511

वेसेल डिजाइन डाटा
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DRAWING NO. B957-303-80-42-DS-3111
REV. B
SHEET 3 OF 3

1-1641-0503 REV.0 A3-420x297

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PDS B957-303-79-41-DS-1212 REV.2

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS / क्लास	FLANGES TYPE / टाईप	FLANGES FACING / फेसिंग	PROJECTION NOTE-4 / प्रोजेक्शन	PAD W x T / पैड	SERVICE / सॉर्विस
N1	1	150	120	300	WN	RF	SEE DWG.	85X T	HC INLET
N2/ N4	2	100 (H)	BY PUMP VENDOR						HC OUTLET (PUMP CONNECTION)
N3	1	50	160	300	WN	RF	SEE DWG.	-	N2 INLET/EQUALISATION
LT 1-2	2	150 (H)	120	300	WN	RF	SEE DWG.	60XT	LEVEL TRANSMITTER (RDAR)
T1	1	50	160	300	WN	RF	SEE DWG.	-	TI TEMPERATURE INSTRUMENT
P1	1	50	160	300	WN	RF	SEE DWG.	-	PI PRESSURE INSTRUMENT
M2	1	600	14 THK.	150	WN	RF	SEE DWG.	200 X T	MANWAY+BF+GASKET+BOLTING+HINGE
M1/ M3	1	600 (H)	14 THK.	150	WN	RF	SEE DWG.	200X T	PUMP MOUNT
UC	1	50	160	300	WN	RF	SEE DWG.	-	STEAM OUT
D1	1	50	160	300	WN	RF	SEE DWG.	-	DRAIN CONNECTION
D2	1	50	160	300	WN	RF	SEE DWG.	-	DRAIN
S1	1	600	14 THK.	150	WN	RF	SEE DWG.	200xT	MOUNTING NOZZLE + BF + GASKET + BOLTING FOR PI, UC,TI & N3

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लोडिगं डाटा (आपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2 ~~ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.~~
3 NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A) FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B) FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5 THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6 FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7 DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8 ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9 NOZZLES SHALL BE STIFFENED WITH 4 NOS. 100 x 10 THK FLATS AT 90 DEG.APART. MANHOLE,PUMP NOZZLE AND MOUNTING NOZZLES SHALL BE STIFFENED WITH 8 NOS 10THKx R.F PAD WIDE FLATS EQUISPACED.
10 ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11 NOZZLES SHOWN WITH BLIND FLANGES / REDUCING FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12 SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13 THE VESSEL SHALL BE LOCATED IN RCC PIT.
14 (a) SIZE OF SUMP1-2 & NOZZLE M2 & M3 IS UNDER HOLD & SHALL BE AS CONFIRMED BY PUMP VENDOR.
14 (b) PUMP NOZZLE COVER / BLIND FLANGE WITH PUMP ASSEMBLY, NOZZLES N3 & N4, BOLTING & GASKET SHALL BE SUPPLIED BY PUMP SUPPLIER.
15 UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED/BOLTED CS INTERNAL SHALL BE 12mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
16 VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190 ºC.
17 LIFTING LUG FOR HANDLING OF VESSEL SHALL BE DESIGNED (CONSIDERING IMPACT FACTOR 1.5) AND PROVIDED BY VENDOR. INDICATIVE DETAILS ARE FURNISHED ON SHEET-3.
18 PROVIDE ELECTRIC TRACING (BY OTHERS) AROUND THE VESSEL CONSIDERING SOLVENT FREEZING POINT AT 10°C.
19A (B) ELECTRICAL TRACING (BY OTHERS) INSULATION TO BE APPLIED AROUND THE VESSEL CONSIDERING SOLVENT FREEZING POINT AT 10°C.
19B (B) INSULATION (IE) MATERIAL:
INNER LAYER: ROCK WOOL (IS8183) - 90mm.
OUTER LAYER: POLYISOCYANURATE (PIR) (ASTM C591, GRADE-2 TYPE-II) - 25mm
20 ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
21 COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	STD. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR HARNDESS REQUIREMENT	6-15-0091
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
X	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038
X	STILL WELL FOR LEVEL TRANSMITTER (RADAR TYPE) FOR BURIED VESSEL	7-12-0039

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (AS MARKED)
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
X	STILL WELL FOR		PIPE DAVIT
X	SUMP DIAMETER, LENGTH		PACKING SUPPORT
X	BURIED HEIGHT		

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SEC.-VIII DIV.-1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	0.1
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. F.V
WORKING TEMPERATURE (°C)	45-90
DESIGN TEMPERATURE (°C)	150
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-21)
HEAT TREATMENT	HEAD: AS PER CODE /SPEC.
OPERATING MEDIUM	HYDROCARBONS (H/C)+WATER
SP. GRAVITY	0.8079-0.8515
WIND SPECIFICATION	IS 875
SEISMIC	IS 1893 + SITE SPECTRA
CAPACITY (M^3)	65
PAINTING/CLEANING	REFER AS PER JOB SPEC.
INSULATION THICKNESS (mm)(NOTE-19B)	(90+25) (IE) ☐ HOT ☐ COLD
FIRE PROOFING CLEATS	B ☐ YES ☒ NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL /~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	☒ EIL ☐ CIB ☒ TPIA/AI

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(AS PER ASME / IS ~~OR EQUIVALENT~~)

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NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
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	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
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INTERNAL STUDS/BOLTS/NUTS	SS 304
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INTERNAL PARTS (WELDED)	SA 516 Gr.70 / SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70
WRAPPER PLATE	SA 516 Gr.70
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PAD FOR EXTERNAL ATTACHMENTS	SA 516 Gr.70
LIFTING LUG	SA 516 Gr.70
STIFFENER	SA 516 Gr.70
STILL WELL FOR LT1 & LT2	SS304L

ASME U-STAMP VESSEL

@ WITHOUT PUMP ASSEMBLY

SPECIAL SERVICE : AROMATIC/BENZENE

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INDIAN BOILER REGULATIONS (IBR)
DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

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HYDROTEST(SHOP)	94000@	HYDROTEST (FIELD)	94000@
NUMBER OF ITEMS :	ONE		

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AROMATIC SUMP	ऐरमैटिक सम्प	B957-303-80-42-DS-3112	B
ITEM NO. 303-VV-HW-3512	आइटम नम्बर 303-वीवी-एचडब्ल्यू-3512	SHEET 1 OF 3	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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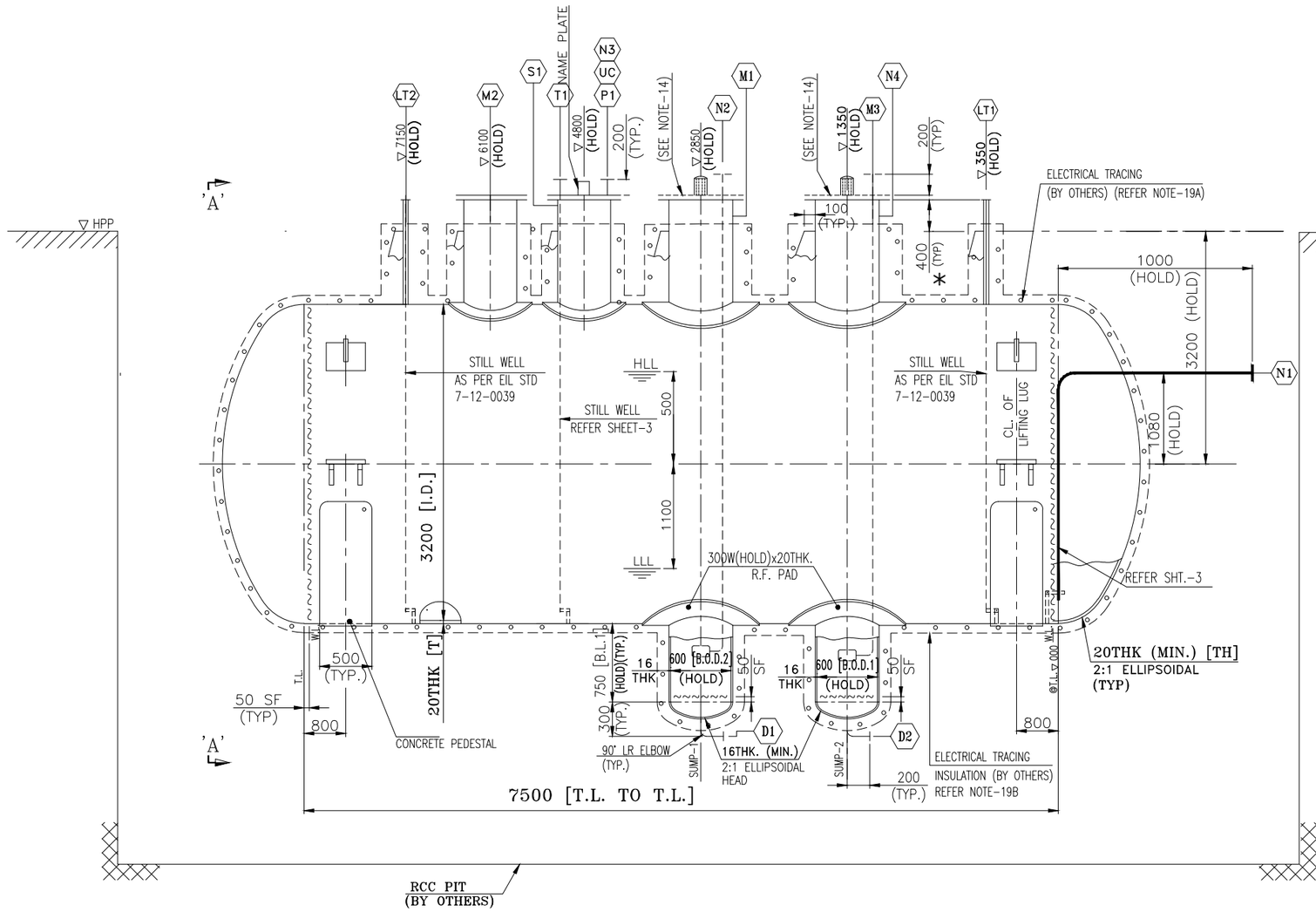
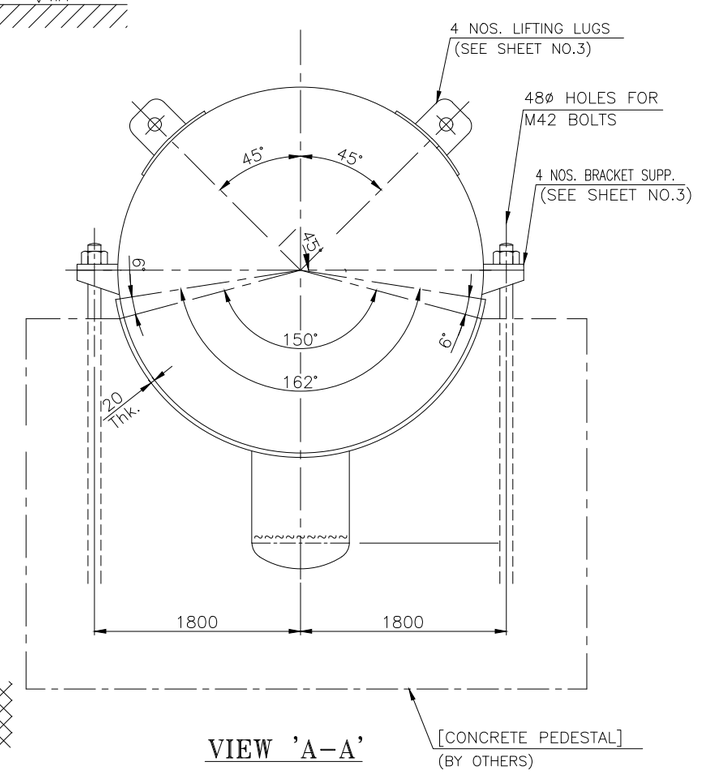
* NOZZLES MAY BE SUITABLY CUT WITH WELD EDGE PREPARATION (WITH SUITABLE COVER)FOR TRANSPORTATION. SUITABLE CUTTING ALLOWANCE IN NOZZLES SHALL BE CONSIDERED TO MAINTAIN THE GIVEN PROJECTION.FINAL ASSEMBLY OF NOZZLES AT SITE SHALL BE BY OTHERS (NOT BY VESSEL FABRICATOR)





VIEW 'A-A'

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	14.01.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
A	15.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
AROMATIC SUMP
ITEM NO. 303-VV-HW-3512

वेसेल डिजाइन डाटा
ऐरमैटिक सम्प
आइटम नम्बर 303-वीवी-एचडब्ल्यू-3512

DRAWING NO. B957-303-80-42-DS-3112
REV. B
SHEET 2 OF 3

1-1641-0503 REV.0 A3-420x297

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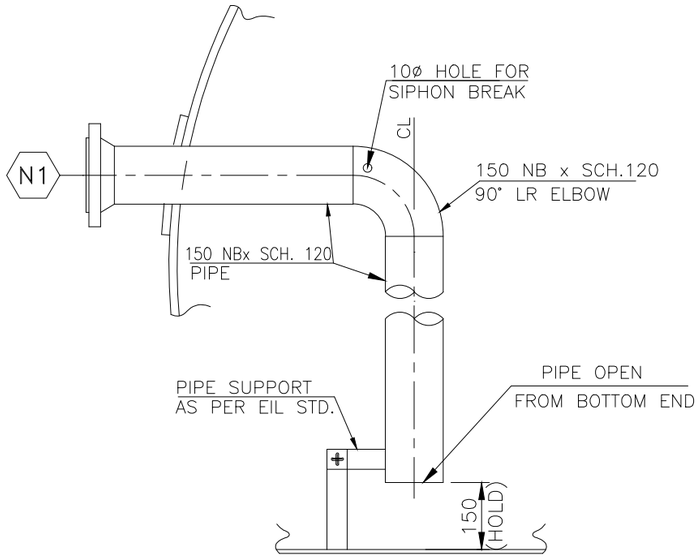
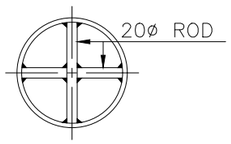
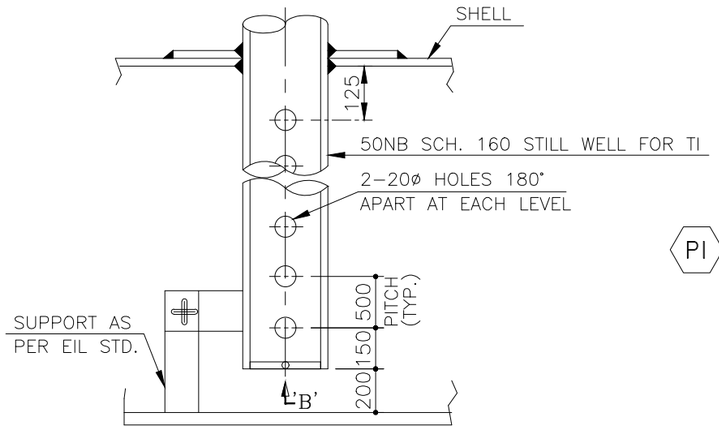


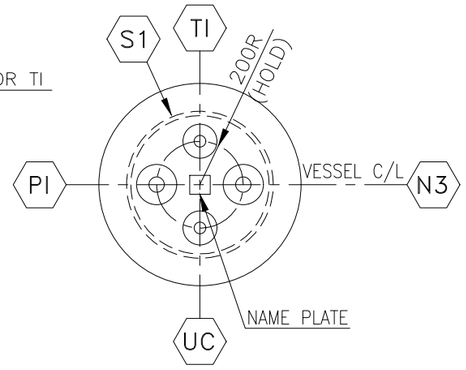
DETAIL OF NOZZLE–N1



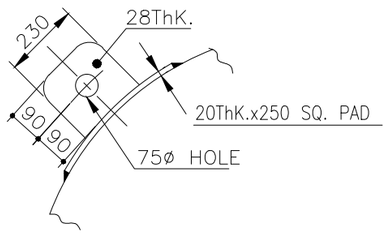
VIEW 'B'
(TYP)



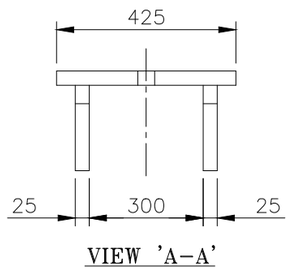
DETAIL OF STILL WELL FOR NOZZLE TI
(HOLD)



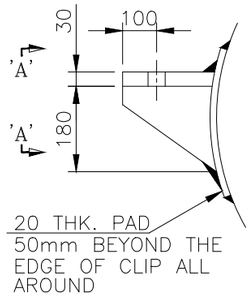
PLAN FOR
MOUNTING NOZZLE S1 (HOLD)
(FOLLOW AS PER NOZZLE ORIENTATION)



DETAIL OF LIFTING LUG (TYP)



VIEW 'A–A'



DETAIL OF BRACKET SUPPORT (TYP)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	14.01.2026	REVISED & REISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	
A	15.12.2025	ISSUED FOR BIDS/ENGG.	AS	RR/VIVEK	PB	

VESSEL DESIGN DATA
AROMATIC SUMP
ITEM NO. 303-VV-HW-3512

वेसेल डिजाइन डाटा
ऐरमैटिक सम्प
आइटम नम्बर 303-वीवी-एचडब्ल्यू-3512

DRAWING NO. B957-303-80-42-DS-3112
REV. B
SHEET 3 OF 3

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेशन	पैड	सर्विस
N1	1	150/ 200	80	150	WN	RF	2020	110X T	HC INLET+REDUCING FLANGE+BOLTING
N2	1	200	80	150	WN	RF	1820	50X T	HC OUTLET
N3	1	100	120	300	WN	RF	SEE DWG.	60xT	MIN. FLOW LINE
N4	1	80	160	300	WN	RF	2020	45X T	N2 INLET / VAPOR OUTLET
N5	1	50	160	300	WN	RF	SEE DWG.	-	WATER OUTLET (BOOT)
LT 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL TRANSMITTER (GWR)-INT
LT 3-10	8	50 (H)	160	300	WN	RF	1420	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL GAUGE (MAG)-INT
LG 3-4	2	50 (H)	160	300	WN	RF	1420	-	LEVEL GAUGE (MAG)
M1-2	2	600	14 THK.	150	WN	RF	SEE DWG.	300X T	MANWAY + BF + GASKET + BOLTING
UC	1	50	160	300	WN	RF	SEE DWG.	45X T	STEAM OUT
V1	1	200	80	150	WN	RF	2020	110X T	PSV CONNECTION
V2	1	150	80	150	WN	RF	2020	85X T	VENTILATION (NOTE-15)
V2A	1	50	160	300	WN	RF	SEE DWG.	-	VENT (NOTE-15)

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM HORIZONTAL FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM VERTICAL PLANE FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. ALL REMOVABLE INTERNALS SHALL BE SIZED SO AS TO PASS THROUGH NEAREST MANHOLE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
14. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
15. BLANKED OFF VENTILATION NOZZLE (V2) PROVIDED AT TOP OF VESSEL. 2" VESSEL VENT NOZZLE TO BE WELDED TO THE VENTILATION NOZZLE BLIND FLANGE.
16. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
X	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-10 & LG1-4)
	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm²g)	0.50
DESIGN PRESSURE	(kg/cm²g)	INT. 3.5 EXT. --
WORKING TEMPERATURE	(°C)	40.4
DESIGN TEMPERATURE	(°C)	150
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		YES (NOTE-14)
HEAT TREATMENT		HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM		HYDROCARBON (H/C)
SP. GRAVITY		0.8558
WIND SPECIFICATION		IS-875
SEISMIC		SITE SPECTRA + IS-1893
CAPACITY	(M^3)	60.4
PAINTING/CLEANING		AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm) (IH)		NIL ☐ HOT ☐ COLD
FIRE PROOFING CLEATS		- ☐ YES ☒ NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL ~~/ VERTICAL (AT TOP)~~
PRESSURE (NEW & COLD)		4.55
INSPECTION BY		☒ EIL ☐ CIB ☒ TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.70
REINFORCEMENT PAD / ~~INSERT PAD~~	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	COMPRESSED FIBRE ASBESTOS FREE @
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT~~/ SUPPORT	SA 516 GR.70/IS 2062 GR.E250 QUALITY BR/B0
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/SA 106 GR.B
INTERNAL PARTS (BOLTED)	SA 516 GR.70/SA 106 GR.B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/ IS 2062 GR. E 250 QUALITY B
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	-

@ INTERNAL GASKETS SHALL BE SUITABLE FOR DESIGN TEMP. AND OPERATING FLUID.

ASME U-CODE STAMPED

SPECIAL SERVICE : AROMATIC/BENZENE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	15500	OPERATING	57500
HYDROTEST(SHOP)	75900	HYDROTEST (FIELD)	79900
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	11.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा
CLAY TOWER CHARGE DRUM	क्ले टॉवर चार्ज ड्रम
ITEM NO. 303-VV-HW-3601	आइटम नम्बर 303-वीवी-एचडब्ल्यू-3601

DRAWING NUMBER डाईग नम्बर	REV
B957-303-80-42-DS-3113	A
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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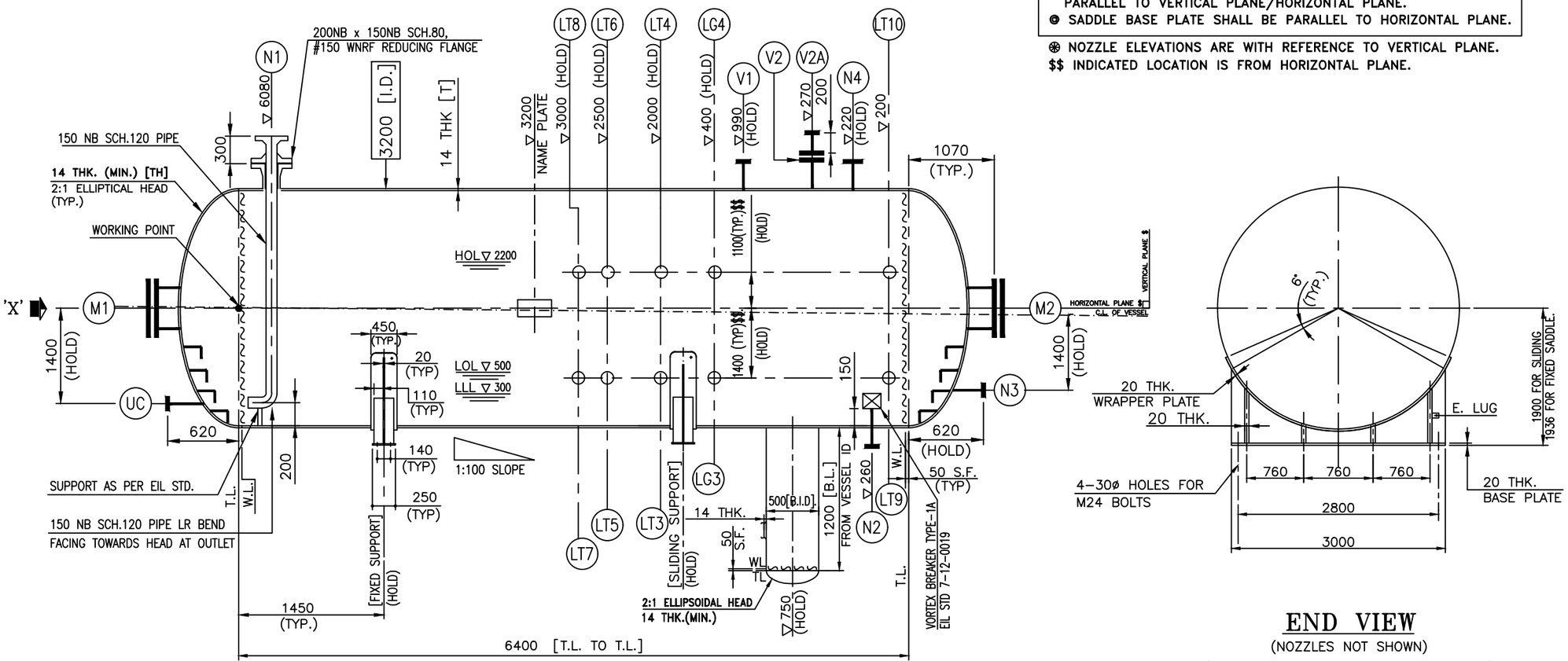
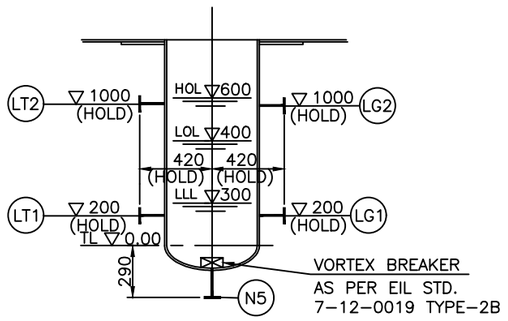
$ NOZZLES AND GASKET FACE OF FLANGES SHALL BE PARALLEL TO VERTICAL PLANE/HORIZONTAL PLANE.
◎ SADDLE BASE PLATE SHALL BE PARALLEL TO HORIZONTAL PLANE.
⊛ NOZZLE ELEVATIONS ARE WITH REFERENCE TO VERTICAL PLANE.
$$ INDICATED LOCATION IS FROM HORIZONTAL PLANE.



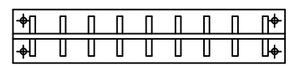
END VIEW

(NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)

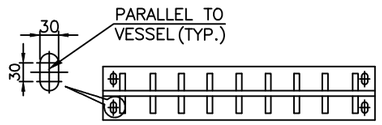
BOOT DETAIL



HOLES FOR FIXED SUPPORT



HOLES FOR SLIDING SUPPORT



ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	11.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
CLAY TOWER
CHARGE DRUM
ITEM NO. 303-VV-HW-3601

वेसेल डिजाइन डाटा
क्ले टॉवर
चार्ज ड्रम
आइटम नम्बर 303-वीवी-एचडब्ल्यू-3601

DRAWING NO. B957-303-80-42-DS-3113
REV. A
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शेड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
N1	1	50	160	600	WN	RF	590	-	CONDENSATE INLET
N2	1	50	160	600	WN	RF	SEE DWG	-	EQUALIZING LINE
N3	1	50	160	600	WN	RF	SEE DWG	-	CONDENATE OUTLET
LT 1-2	2	50 (H)	160	600	WN	RF	590	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50 (H)	160	600	WN	RF	590	-	LEVEL GAUGE MAGNETIC (SS)
V	1	50	160	600	WN	RF	SEE DWG	-	VENT
H 1-2	2	200	80	600	WN	RF	690	110X T	HANDHOLES + BF + GASKET
P1	1	50	160	600	WN	RF	SEE DWG	-	PI PRESSURE INSTRUMENT
UC	1	50	160	600	WN	RF	590	-	UTILITY CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190°C WITH VESSEL OPEN.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER CODE & IBR AND MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & AI AND ALSO GET THE EQPT. INSPECTED BY CIB & AI.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR & CODE REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD.
17. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
18. HYDROTEST SHALL BE CARRIED OUT AS PER IBR & CODE REQUIREMENTS.
19. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES L1A-B & L2A-B
X	NOZZLE ELEVATIONS L1A-B & L2A-B		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	INSULATION THICKNESS		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR & ASME SEC. VIII DIV.I ED.2023
WORKING PRESSURE (kg/cm²g)	38
DESIGN PRESSURE (kg/cm²g)	INT. 46 EXT. F.V
WORKING TEMPERATURE (°C)	247.8
DESIGN TEMPERATURE (°C)	420
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	YES (NOTE-20)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.8022
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	0.7
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-12)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR & CODE
INSPECTION BY	[ ] EIL [X] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 GR.70
REINFORCEMENT PAD	SA 516 GR.70
HEADS	SA 516 GR.70
SHELL FLANGES/SR/LWN	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/PIPE SUPPORT	SA 106 GR. B
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	-
VACUUM STIFFENER	-
LIFTING LUG	SA 516 GR.70

U-CODE STAMPED

PIPE, PLATFORM & LADDER CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**

[ ] **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	1800	OPERATING	2300
HYDROTEST(SHOP)	2500	HYDROTEST (FIELD)	2500
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
A	05.12.2025	ISSUED FOR BIDS / ENGG.	AS	CRG/VIVEK	PB

DESIGN DATA	CLAY TOWER CHARGE HEATER CONDENSATE POT
ITEM NO.	303-VV-VW-3602
डिजाइन डाटा	क्ले टावर चार्ज हीटर कन्डेन्सेट पॉट
आइटम नम्बर	303-वीवी-वीडब्ल्यू-3602
DRAWING NUMBER / डाईग नम्बर	B957-303-80-42-DS-3114
REV	A
SHEET	1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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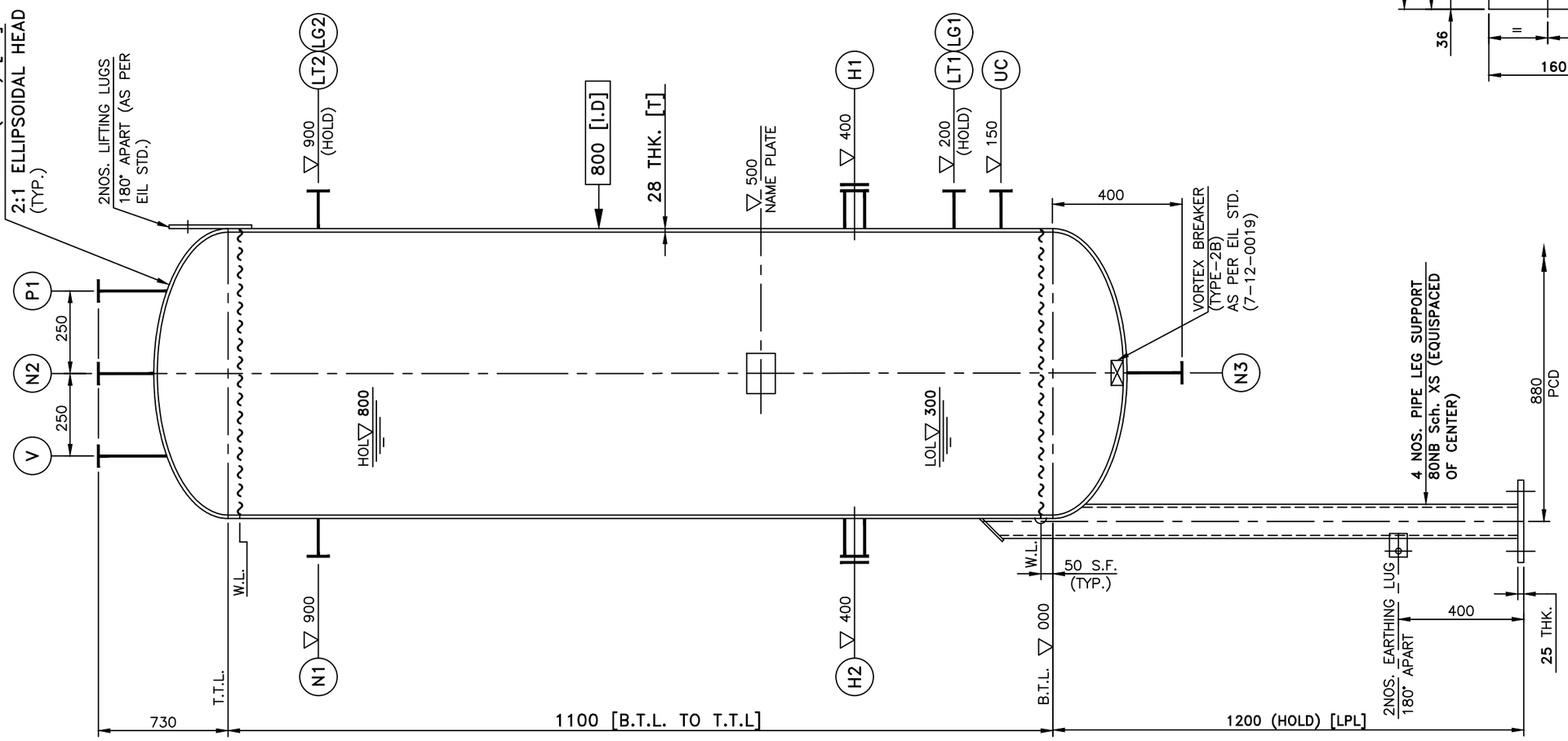

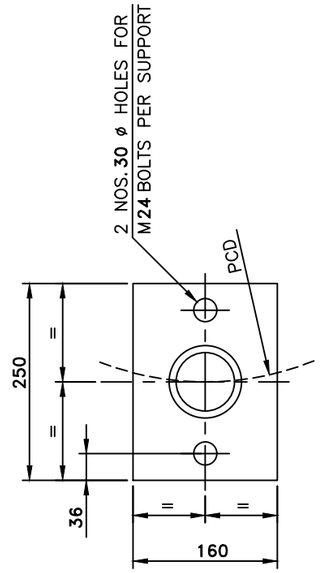

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
A	08.12.2025	ISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	

VESSEL DESIGN DATA
CLAY TOWER CHARGE
HEATER CONDENSATE
POT
ITEM NO. 303-VV-VW-3602

वेसेल डिजाइन डाटा
क्ले टावर चार्ज
हीटर कन्डेन्सेट पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3602

DRAWING NO. B957-303-80-42-DS-3114 | REV. A

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS: B957- REV.-3

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेक्शन	पैड	सर्विस
N1	1	250/ 300	14 THK.	150	WN	RF	1820	160XT	HC INLET + REDUCING FLANGE + BOLTING (NOTE-15)
N2	1	200	80	150	WN	RF	1620	110X T	HC OUTLET
N3	1	100	120	300	WN	RF	SEE DWG.	60X T	MIN FLOW LINE
N4	1	80	160	300	WN	RF	1820	45xT	N2 INLET/VAPOR OUTLET
N5	1	50	160	300	WN	RF	SEE DWG.	-	WATER OUTLET (BOOT)
N6	1	50	160	300	WN	RF	1820	-	EQUALIZING LINE
LT 1-2	2	50	160	300	WN	RF	SEE DWG.	-	LEVEL TRANSMITTER (GWR)-INT
LT 3-10	8	50	160	300	WN	RF	1230	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50	160	300	WN	RF	SEE DWG.	-	LEVEL GAUGE (MAG)-INT
LG 3-4	2	50	160	300	WN	RF	1230	-	LEVEL GAUGE (MAG)
P1	1	50	160	300	WN	RF	1820	-	PI PRESSURE INSTRUMENT
M1-2	2	600	14 THK.	150	WN	RF	SEE DWG.	300xT	MANWAY + BF + DAVIT + GASKET + BOLTING
UC	1	50	160	300	WN	RF	SEE DWG.	45xT	STEAM OUT
V1	1	150	80	150	WN	RF	1820	85xT	VENTILATIONS (NOTE-16)
V1A	1	50	160	150	WN	RF	SEE DWG.	-	VENT (NOTE-16)

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM HORIZONTAL PLANE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM VERTICAL PLANE TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
13. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
14. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
15. PROVIDE AT NOZZLE N1, DIP PIPE OF 10'' FROM 12'' NOZZLE WITH CLOSE END 200 MM FROM THE BOTTOM AND HAVING 4 HOLES 100 MM WIDTH X 280 MM HIGH ON SIDE, FACING TOWARDS HEAD.
16. BLANKED OFF VENTILATION NOZZLE (V1) PROVIDED AT TOP OF VESSEL. 2" VESSEL VENT NOZZLE TO BE WELDED TO THE VENTILATION NOZZLE BLIND FLANGE.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-10, LG 1-4)
	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE (kg/cm²g)	0.3
DESIGN PRESSURE (kg/cm²g)	INT. 3.5 EXT. --
WORKING TEMPERATURE (°C)	65
DESIGN TEMPERATURE (°C)	150
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-13)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	BENZENE + WATER
SP. GRAVITY	0.8347
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	48.1
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm) (IS)	70 (HOLD) [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[ ] YES [X] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)	4.55
INSPECTION BY	[X] EIL [ ] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	SA 516 GR.70
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	B SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/BO WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

ASME U-CODE STAMPED

SPECIAL SERVICE : BENZENE / AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	13500	OPERATING	46000
HYDROTEST(SHOP)	61600	HYDROTEST (FIELD)	67100
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB
A	12.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	BENZENE COLUMN OVHD RECEIVER	ITEM NO.	303-VV-HW-3603
डिजाइन डाटा	बेन्जीन कालम ओवहेड रसीवर	आइटम नम्बर	303-वीवी-एचडब्ल्यू-3603

DRAWING NUMBER / डाईग नम्बर: **B957-303-80-42-DS-3115** REV: B

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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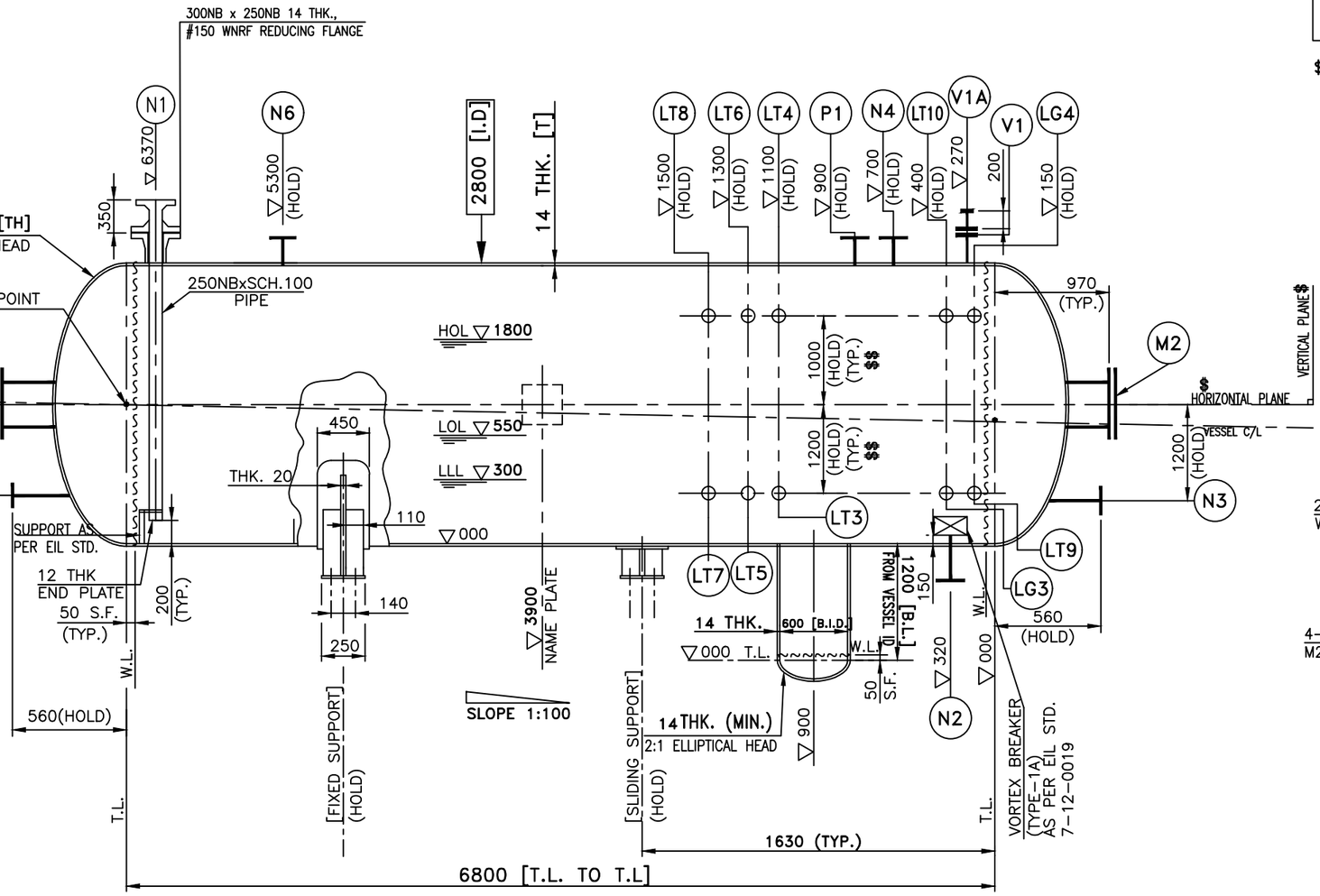
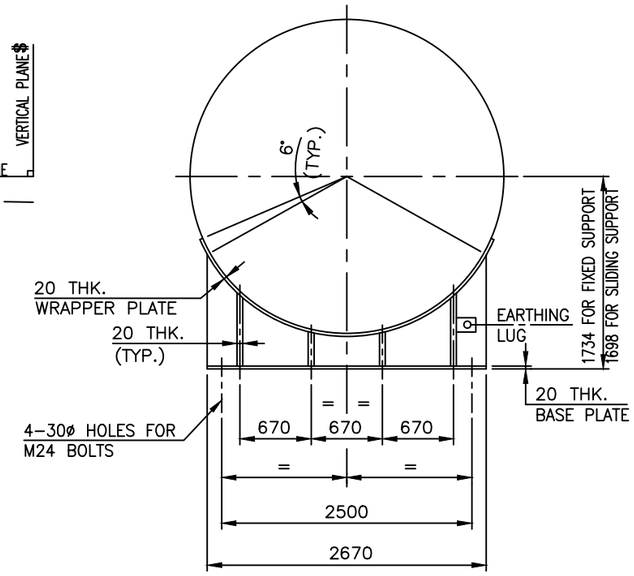
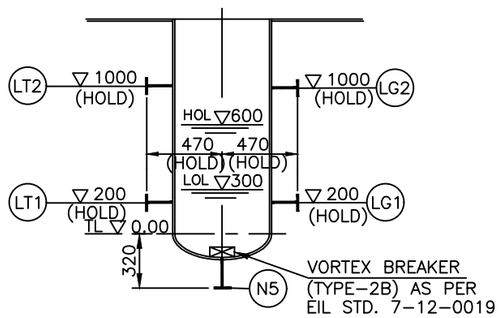
$ 1) NOZZLES AND GASKET FACE OF FLANGES SHALL BE PARALLEL TO VERTICAL PLANE/HORIZONTAL PLANE
2) BASE PLATE TO SUPPORT SADDLE SHALL BE PARALLEL TO HORIZONTAL PLANE
3) NOZZLE ELEVATION/PROJECTION ARE WITH REFERENCED VERTICAL /HORIZONTAL PLANE

$$ INDICATED LOCATION IS FROM HORIZONTAL PLANE.

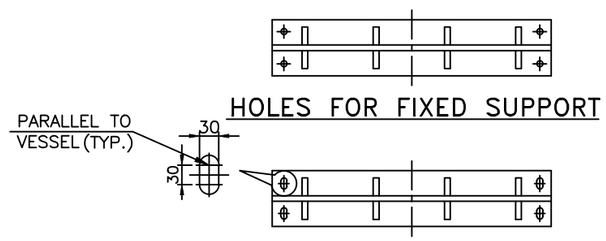




END VIEW
(NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



BOOT DETAIL



HOLES FOR FIXED SUPPORT

HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	
A	12.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
BENZENE COLUMN
OVHD RECEIVER
ITEM NO. 303-VV-HW-3603

वेसेल डिजाइन डाटा
बेन्जीन कालम
ओवहेड रसीवर
आइटम नम्बर 303-वीवी-एचडब्ल्यू-3603

DRAWING NO. B957-303-80-42-DS-3115
REV. B
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.0

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	100	120	600	WN	RF	830	60xT	CONDENSATE INLET
N2	1	50	160	600	WN	RF	SEE DWG	-	EQUALIZING LINE
N3	1	100	120	600	WN	RF	SEE DWG	60xT	CONDENSATE OUTLET
LT 1-2	2	50 (H)	160	300	WN	RF	780	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50 (H)	160	300	WN	RF	780	-	LEVEL GAUGE MAGNETIC (SS)
V	1	50	160	600	WN	RF	SEE DWG	-	VENT
M	1	500	14 THK.	300	WN	RF	930	250xT	MANWAY + BF + DAVIT + GASKET + BOLTING
P1	1	50	160	600	WN	RF	SEE DWG	-	PI PRESSURE INSTRUMENT
UC	1	50	160	600	WN	RF	780	-	UTILITY CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90^0 APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
13. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER CODE & IBR AND MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & AI AND ALSO GET THE EQPT. INSPECTED BY CIB & AI.
14. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR & CODE REQUIREMENTS.
15. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
16. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD.
17. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
18. HYDROTEST SHALL BE CARRIED OUT AS PER IBR & CODE REQUIREMENTS.
19. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING B	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	-
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-2 & LG 1-2)
X	NOZZLE ELEVATIONS (LT1-2 & LG 1-2)		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	NOZZLE RATINGS		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR & ASME SEC. VIII DIV.I ED.2023
WORKING PRESSURE (kg/cm²g)	17
DESIGN PRESSURE (kg/cm²g)	INT. 22 EXT. F.V.
WORKING TEMPERATURE (°C)	206.2
DESIGN TEMPERATURE (°C)	350
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	YES (NOTE-19)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	MP CONDENSATE
SP. GRAVITY	0.8573
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M^3)	2.4
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm) (IS)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR & CODE
INSPECTION BY	[ ] EIL [X] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT/~~ SUPPORT	SA 106 GR. B
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 Gr.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	-
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

ASME U STAMPED

PLATFORM OR PIPE CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**
[ ] **DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)**

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	2600	OPERATING	4000
HYDROTEST(SHOP)	5000	HYDROTEST (FIELD)	5250
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB
A	08.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA

BENZENE COLUMN REBOILER II CONDENSATE POT

ITEM NO. 303-VV-VW-3604

डिजाइन डाटा

बेंजीन कॉलम रीबॉयलर II कन्डैसेट पॉट

आइटम नम्बर 303–वीवी–वीडब्ल्यू–3604

DRAWING NUMBER / डाईग नम्बर: **B957-303-80-42-DS-3116** REV: B

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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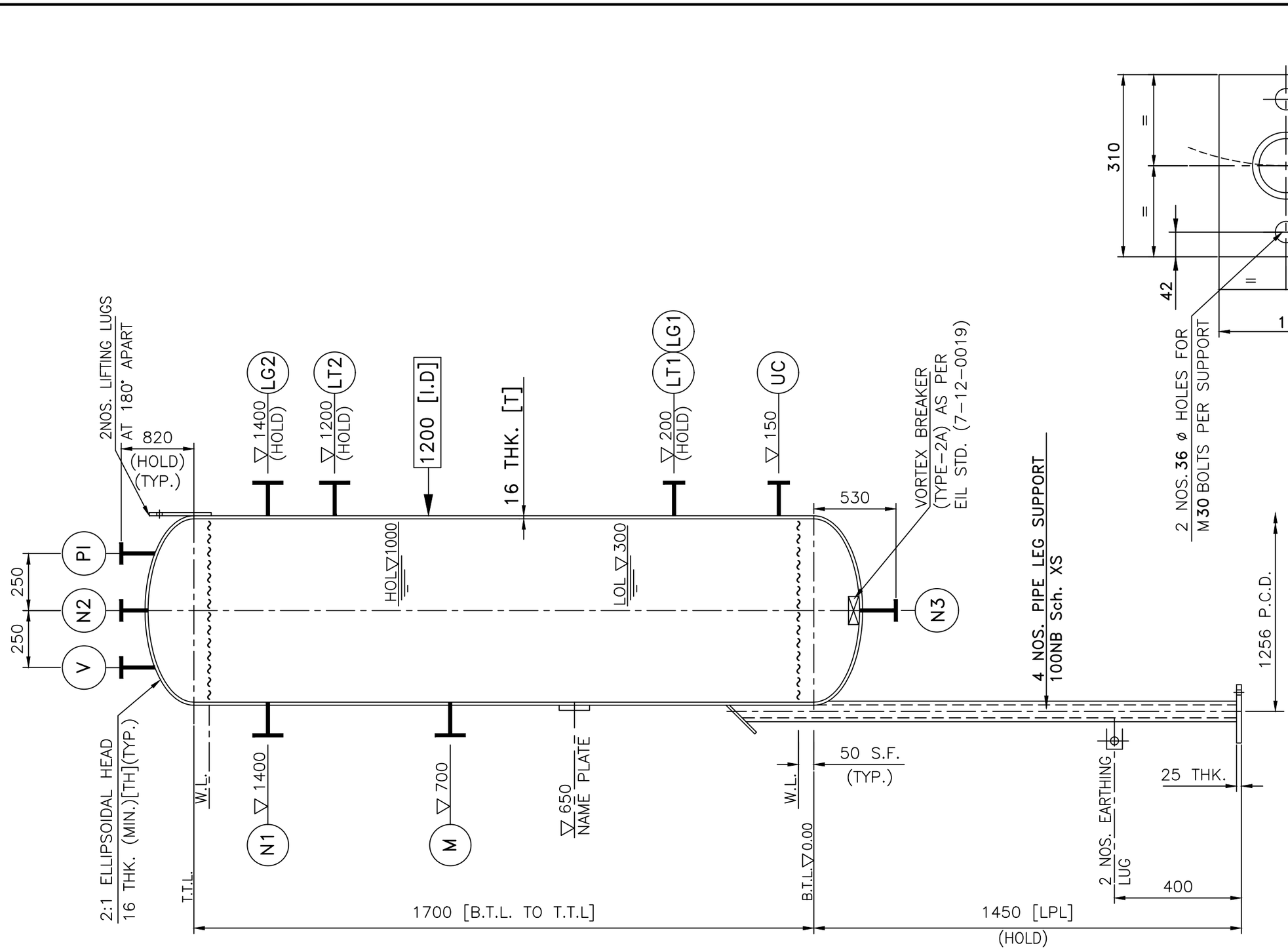

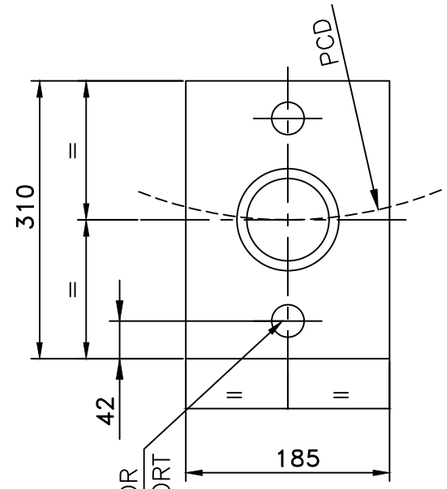

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

B	16.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB		
A	08.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB		
REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED	

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

VESSEL DESIGN DATA
BENZENE COLUMN
REBOILER II
CONDENSATE POT
ITEM NO. 303-VV-VW-3604

वेसेल डिजाइन डाटा
बेंजीन कॉलम
रीबॉयलर II कन्डैसेट पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3604

DRAWING NO. B957-303-80-42-DS-3116
REV. B
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.3

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सर्विस
N1	1	150/ 200	80	300	WN	RF	2020	110X T	HC INLET FROM CONDENSER + REDUCING FLANGE + BOLTING (NOTE-16)
N2	1	50	160	300	WN	RF	2020	-	EQUALIZING LINE
N3	1	250	80	300	WN	RF	1820	135X T	HC OUTLET
N4	1	80	160	300	WN	RF	2020	45xT	N2 INLET/VAPOR OUTLET
N5	1	150	80	300	WN	RF	SEE DWG.	85xT	MIN FLOW LINE
N6	1	50	160	300	WN	RF	SEE DWG.	-	WATER OUTLET (BOOT)
N7	1	250/ 300	14 THK.	300	WN	RF	2020	160X T	HC INLET FROM BENZENE REBOILER I (NOTE 17)
N8	1	250	80	300	WN	RF	2020	135X T	OVHD HOT BYPASS INLET
LT 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL TRANSMITTER (GWR)-INT
LT 3-10	8	50 (H)	160	300	WN	RF	1410	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50 (H)	160	300	WN	RF	SEE DWG.	-	LEVEL GAUGE (MAG)-INT
LG 3-4	2	50 (H)	160	300	WN	RF	1410	-	LEVEL GAUGE (MAG)
P1	1	50	160	300	WN	RF	2020	-	PI PRESSURE INSTRUMENT
M1-2	2	600	14 THK.	150	WN	RF	SEE DWG.	300xT	MANWAY + BF + DAVIT + GASKET
UC	1	50	160	300	WN	RF	SEE DWG.	45xT	STEAM OUT
V1	1	100	120	300	WN	RF	2020	60xT	PSV CONNECTION
V2	1	150	80	300	WN	RF	2020	85xT	VENTILLATION (NOTE-15)
V2A	1	50	160	300	WN	RF	SEE DWG.	-	VENT (NOTE-15)

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC. WITH VESSEL OPEN.
13. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
14. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
15. BLANKED OFF VENTILATION NOZZLE (V2) PROVIDED AT TOP OF VESSEL. 2" VESSEL VENT NOZZLE TO BE WELDED TO THE VENTILATION NOZZLE BLIND FLANGE.
16. PROVIDE AT NOZZLE N1, DIP PIPE OF 6 INCH FROM 8 INCH NOZZLE WITH CLOSE END 200 MM FROM THE BOTTOM AND HAVING 16 4 HOLES 50 MM WIDTH X 200 MM HIGH ON SIDE, FACING TOWARDS HEAD.
17. PROVIDE AT NOZZLE N7, DIP PIPE OF 10'' FROM 12'' NOZZLE WITH CLOSE END 200 MM FROM THE BOTTOM AND HAVING 22 4 HOLES 80 MM WIDTH X 350 MM HIGH ON SIDE, FACING TOWARDS HEAD.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	
PIPE SUPPORT CLEATS	
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-10, LG1-4)
	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	3.5
DESIGN PRESSURE	(kg/cm^2g)	INT. 6.5 EXT. --
WORKING TEMPERATURE	(°C)	162
DESIGN TEMPERATURE	(°C)	250
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		YES (NOTE-13)
HEAT TREATMENT		HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM		TOLUENE + WATER
SP. GRAVITY		0.7276
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	60.4
PAINTING/CLEANING		AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm) (IS)		70(H) [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[ ] YES [X] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)		8.45
INSPECTION BY		[X] EIL [ ] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL / BOOT	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
~~SKIRT~~/ SUPPORT	SA 516 GR.70
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	B SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/BO WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

ASME U CODE STAMPED

SPECIAL SERVICE : BENZENE / AROMATIC

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	17000	OPERATING	54500
HYDROTEST(SHOP)	77400	HYDROTEST (FIELD)	82900
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB
A	13.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा
TOLUENE COLUMN OVHD RECEIVER	टाल्युईन कालम ओविएचडी रीसीवर
ITEM NO. 303-VV-HW-3606	आइटम नम्बर 303-वीवी-एचडब्ल्यू-3606

DRAWING NUMBER / डाईग नम्बर: **B957-303-80-42-DS-3118** REV: B

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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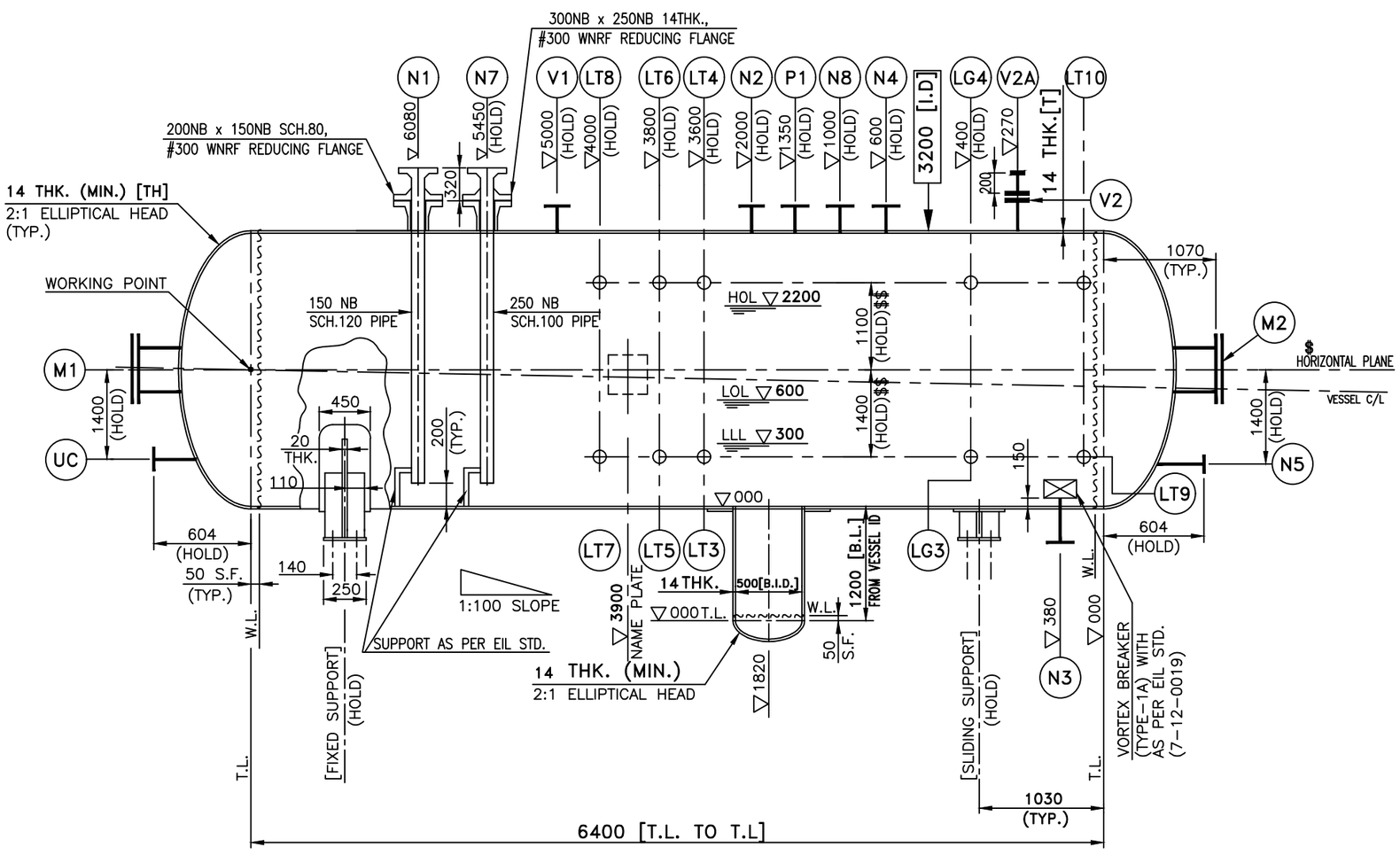
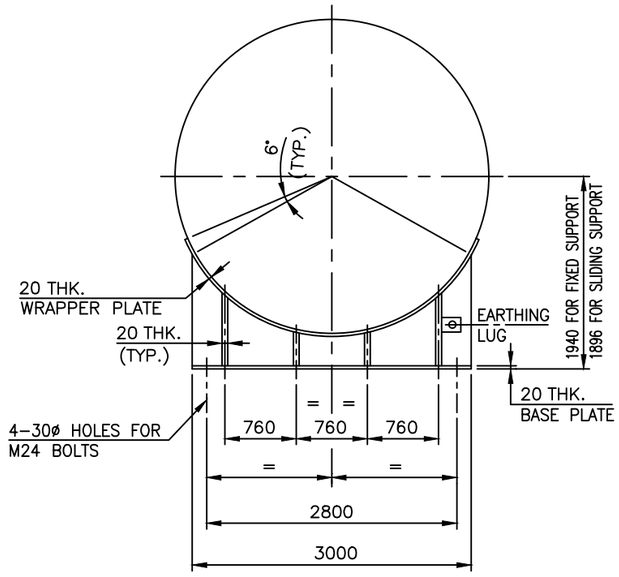
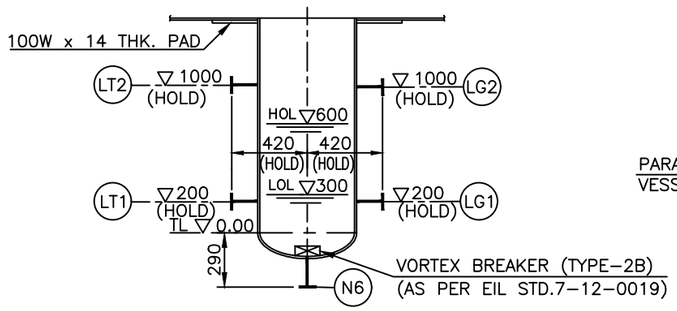
$ 1) NOZZLES AND GASKET FACE OF FLANGES SHALL BE PARALLEL TO VERTICAL PLANE/HORIZONTAL PLANE
2) BASE PLATE TO SUPPORT SADDLE SHALL BE PARALLEL TO HORIZONTAL PLANE
3) NOZZLE ELEVATION/PROJECTION ARE WITH REFERENCED VERTICAL /HORIZONTAL PLANE

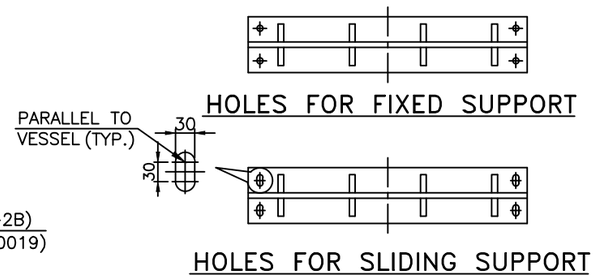




END VIEW
(NOZZLES NOT SHOWN)
(ALL OTHER DIMENSIONS AS PER EIL STD.)



BOOT DETAIL



ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	
A	13.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
TOLUENE COLUMN
OVHD RECEIVER
ITEM NO. 303-VV-HW-3606

वेसेल डिजाइन डाटा
टाल्युईन कालम
ओविएचडी रीसीवर
आइटम नम्बर 303-वीवी-एचडब्ल्यू-3606

DRAWING NO. B957-303-80-42-DS-3118
REV. B
SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK / मार्क	QTY / क्वान्टिटी	NOM. DIA नामिनल डायां	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS / क्लास	FLANGES TYPE / टाईप	FLANGES FACING / फेसिंग	PROJECTION NOTE-4 / प्रोजेक्शन	PAD W x T / पैड	SERVICE / सर्विस
N1	1	150	80	600	WN	RF	900	85X T	CONDENSATE INLET
N2	1	50	160	600	WN	RF	SEE DWG.	40x T	EQUALIZING LINE
N3	1	150	80	600	WN	RF	SEE DWG.	85X T	CONDENSATE OUTLET
LT 1-2	2	50(H)	160	600	WN	RF	850	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50(H)	160	600	WN	RF	850	-	LEVEL GAUGE MAGNETIC (SS)
V	1	50	160	600	WN	RF	SEE DWG.	40x T	VENT
M	1	600	40 THK.	600	WN	RF	1000	300xT	MANWAY + BF + GASKET + DAVIT + BOLTING
P1	1	50	160	600	WN	RF	SEE DWG.	40x T	PI PRESSURE INSTRUMENT
UC	1	50	160	600	WN	RF	850	40x T	UTILITY CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लोडिगं डाटा (आपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190 ºc WITH VESSEL OPEN.
14. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
15. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER CODE & IBR AND MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & AI AND ALSO GET THE EQPT. INSPECTED BY CIB & AI.
16. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR & CODE REQUIREMENTS.
17. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
18. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD.
19. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
20. HYDROTEST SHALL BE CARRIED OUT AS PER IBR & CODE REQUIREMENTS.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	NOT APPLICABLE
	PIPE SUPPORT CLEATS	NOT APPLICABLE
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES
X	NOZZLE ELEVATIONS		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	NOZZLE RATINGS		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR & ASME SEC. VIII DIV.I ED.2023
WORKING PRESSURE (kg/cm²g)	38
DESIGN PRESSURE (kg/cm²g)	INT. 46 EXT. F.V.
WORKING TEMPERATURE (°C)	247.8
DESIGN TEMPERATURE (°C)	420
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPTICAL
JOINT EFFICIENCY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	YES (NOTE-14)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.8022
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	3.1
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-12)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR & CODE
INSPECTION BY	[ ] EIL [X] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	-
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT/~~ SUPPORT	SA 106 GR.B
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 Gr.70
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	-
PIPE DAVIT	-
LIFTING LUG	SA 516 GR.70

U-CODE STAMPED

PLATFORM OR PIPE CLIPS SHALL NOT BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

X	**INDIAN BOILER REGULATIONS (IBR)**
	DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	7000	OPERATING	9000
HYDROTEST(SHOP)	10100	HYDROTEST (FIELD)	10100
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	08.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	CRG/VIVEK	PB
A	07.08.2025	ISSUED FOR BIDS / ENGG.	AS	CRG/VIVEK	PB

DESIGN DATA
TOLUENE COLUMN REBOILER CONDENSATE POT
ITEM NO. 303-VV-VW-3607

डिजाइन डाटा
टोल्यून कॉलम रीबॉयलर कन्डनसेट पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3607

DRAWING NUMBER / डाईग नम्बर: **B957-303-80-42-DS-3119** REV: B
SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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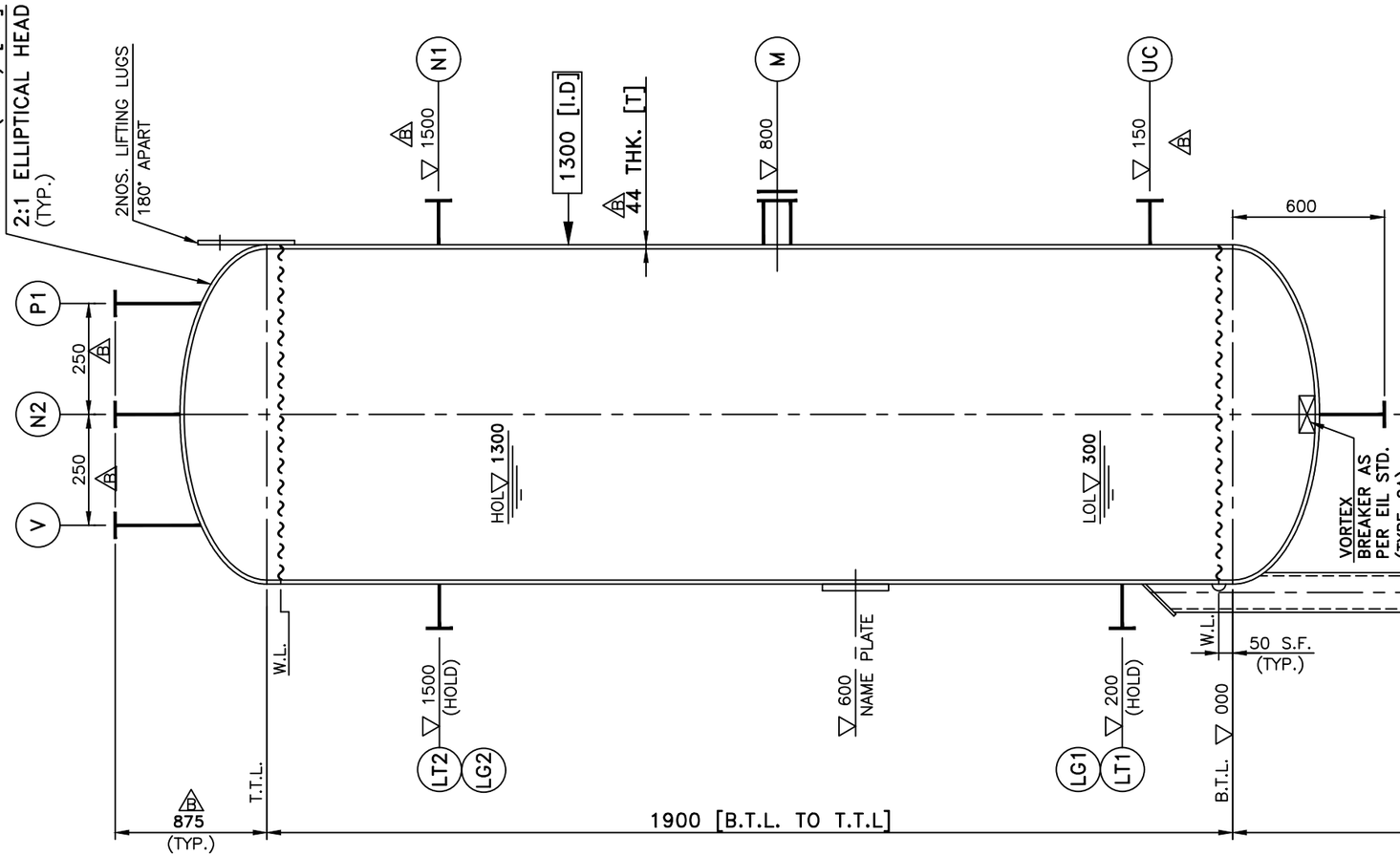

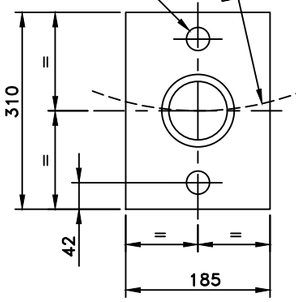

DETAIL OF BASE PLATE (HOLD)
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	08.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	
A	07.08.2025	ISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	

VESSEL DESIGN DATA
TOLUENE COLUMN REBOILER CONDENSATE POT
ITEM NO. 303-VV-VW-3607

वेसल डिजाइन डाटा
टोल्यून कॉलम रीबॉयलर कन्डनसेट पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3607

DRAWING NO. B957-303-80-42-DS-3119 | REV. B

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.3

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिग	प्रोजेशन	पैड	सर्विस
N1	1	150/ 200	80	300	WN	RF	1420	110xT	HC INLET+ REDUCING FLANGE+ BOLTING (NOTE-16)
N2	1	100	120	300	WN	RF	1220	60xT	HC OUTLET
N3	1	50	160	300	WN	RF	1420	-	N2 INLET/VAPOR OUTLET
N4	1	50	160	300	WN	RF	SEE DWG.	-	MIN FLOW LINE
N5	1	50	160	300	WN	RF	1420	-	EQUALIZING LINE
LT 1-8	8	50 (H)	160	300	WN	RF	1030	-	LEVEL TRANSMITTER (DP)
LG 1-2	2	50 (H)	160	300	WN	RF	1030	-	LEVEL GAUGE MAGNETIC (SS)
P1	1	50	160	300	WN	RF	1420	-	PRESSURE INSTRUMENT
M	1	600	10 THK.	150	WN	RF	SEE DWG.	300xT	MANWAY + BF + GASKET + BOLTING + DAVIT
UC	1	50	160	300	WN	RF	SEE DWG.	45xT	STEAM OUT
V1	1	100	120	300	WN	RF	1420	60xT	VENTILLATION (NOTE-15)
V1A	1	50	160	300	WN	RF	SEE DWG.	-	VENT (NOTE-15)

'T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसन्सर स्पेसिफिकशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉऊडशन लोडिगं डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC (DB)	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES-B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
13. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
14. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.
15. BLANKED OFF VENTILATION NOZZLE (V2) PROVIDED AT TOP OF VESSEL. 2" VESSEL VENT NOZZLE TO BE WELDED TO THE VENTILATION NOZZLE BLIND FLANGE.
16. PROVIDE AT NOZZLE N1, DIP PIPE OF 6" FROM 8" NOZZLE WITH CLOSE END 200 MM FROM THE BOTTOM AND HAVING 4 HOLES 50 MM WIDTH X 200 MM HIGH ON SIDE, FACING TOWARDS HEAD.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
X	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
X	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
X	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
	DEMISTER DATA SHEET	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT 1-8, LG 1-2)
	NOZZLE ELEVATIONS	X	PIPE SUPPORT CLEATS
	SUPPORT HEIGHT	X	LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE		ASME SECTION VIII DIV.1 EDITION 2023
WORKING PRESSURE	(kg/cm^2g)	0.3
DESIGN PRESSURE	(kg/cm^2g)	INT. 3.5 EXT. --
WORKING TEMPERATURE	(°C)	138.1
DESIGN TEMPERATURE	(°C)	250
MDMT	(°C)	1.1
CORROSION ALLOWANCE	(mm)	3
TYPE OF HEAD		2:1 ELLIPTICAL
JOINT EFFICIENCY		SHELL 1 HEAD 1
RADIOGRAPHY		SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT		YES (NOTE-13)
HEAT TREATMENT		HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM		HYDROCARBON (H/C) + WATER
SP. GRAVITY		0.7643
WIND SPECIFICATION		IS-875 (PART-3)
SEISMIC		SITE SPECTRA + IS-1893 (PART-4)
CAPACITY	(M^3)	14.7
PAINTING/CLEANING		AS PER JOB SPECIFICATION (REFER NOTE-12)
INSULATION THICKNESS (mm) (IS)		70 (H) [X] HOT [ ] COLD
FIRE PROOFING CLEATS		[ ] YES [X] NO
HYDROSTATIC TEST	(kg/cm2g)	HORIZONTAL / ~~VERTICAL~~ (AT TOP)
PRESSURE (NEW & COLD)		4.55
INSPECTION BY		[X] EIL [ ] CIB [X] TPIA / AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)
(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 Gr.70
REINFORCEMENT PAD	SA 516 Gr.70
HEADS	SA 516 Gr.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	SA 516 Gr.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304 METAL WINDING AND GRAFOIL FILLER MATERIAL WITH CS OUTER & SS 304 INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/ SUPPORT	IS 2062 GR.E250 QUALITY BR/BO
~~SKIRT~~/ SUPPORT BASE	IS 2062 GR.E250 QUALITY BR/BO
INTERNAL PARTS (WELDED)	SA 516 GR.70/ SA 106 GR.B
INTERNAL PARTS (BOLTED)	SA 516 GR.70/ SA 106 GR.B
CLIPS & ATTACHMENTS (EXTERNAL)	B SA 516 GR.70/ IS 2062 GR. E 250 QUALITY BR/BO WELDED OVER BQCS PAD
WRAPPER PLATE	SA 516 GR.70
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70

ASME U CODE STAMPED

SPECIAL SERVICE : AROMATIC/BENZENE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	5300	OPERATING	16000
HYDROTEST(SHOP)	20000	HYDROTEST (FIELD)	22200
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB
A	11.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा	DRAWING NUMBER / डाईग नम्बर	REV
XYLENE COLUMN OVHD RECEIVER	जाइलीन कालम ओविएचडी रीसीवर	B957-303-80-42-DS-3120	B
ITEM NO. 303-VV-HW-3608	आइटम नम्बर 303-वीवी-एचडब्ल्यू-3608	SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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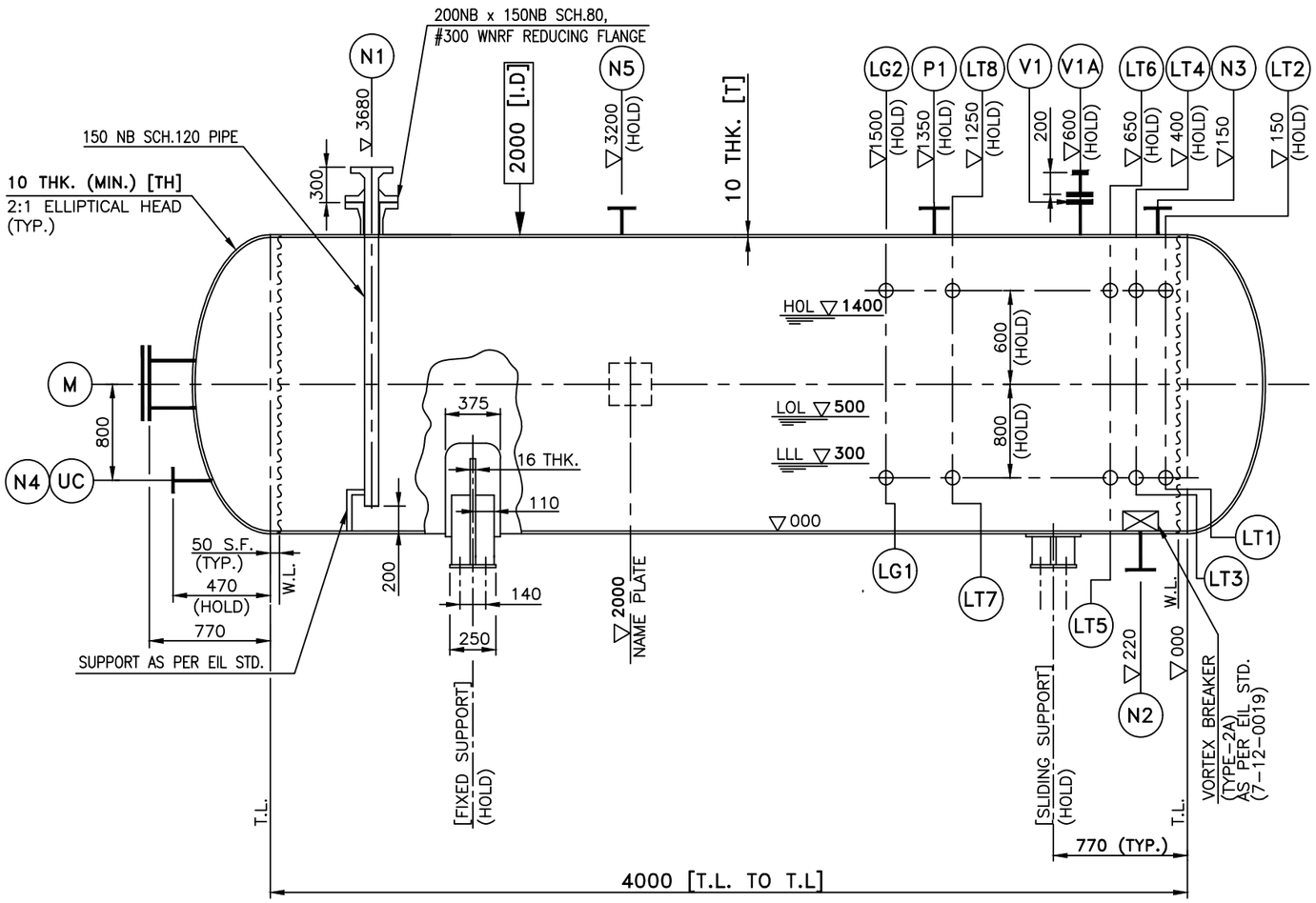
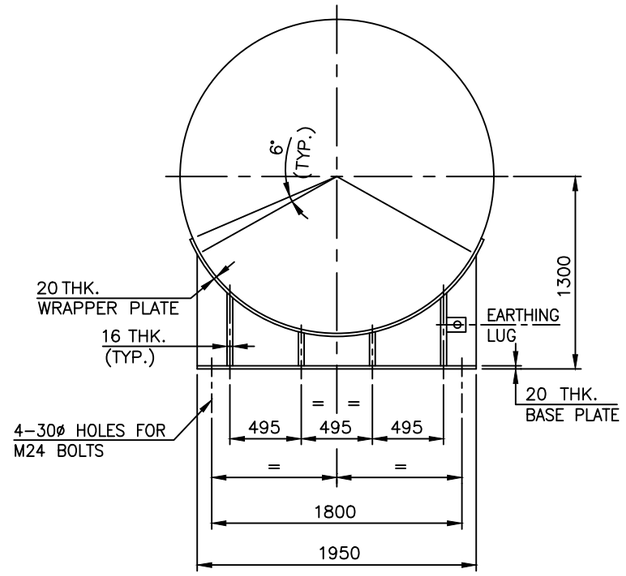
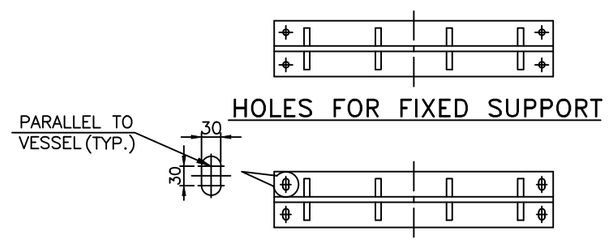




END VIEW

(NOZZLES NOT SHOWN)

(ALL OTHER DIMENSIONS AS PER EIL STD.)



HOLES FOR FIXED SUPPORT

HOLES FOR SLIDING SUPPORT

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	16.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	
A	11.12.2025	ISSUED FOR BIDS/ENGG.	AS	SSR/SA	PB	

VESSEL DESIGN DATA
XYLENE COLUMN
OVHD RECEIVER
ITEM NO. 303-VV-HW-3608

वेसेल डिजाइन डाटा
जाइलीन कालम
ओविएचडी रीसीवर
आइटम नम्बर 303-वीवी-एचडब्ल्यू-3608

DRAWING NO. B957-303-80-42-DS-3120 | REV. B

SHEET 2 OF 2

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK मार्क	QTY क्वान्टिटी	NOM. DIA नामिनल डांया	SCH./THK. शड्यूल व थिकनैस	FLANGES CLASS क्लास	FLANGES TYPE टाईप	FLANGES FACING फेसिंग	PROJECTION NOTE-4 प्रोजेक्शन	PAD W x T पैड	SERVICE सार्विस
N1	1	80	160	600	WN	RF	640	45XT	CONDENSATE INLET
N2	1	50	160	600	WN	RF	SEE DWG	-	EQUALIZING LINE
N3	1	80	160	600	WN	RF	SEE DWG	45X T	CONDENATE OUTLET
LT 1-2	2	50 (H)	160	600	WN	RF	590	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50 (H)	160	600	WN	RF	590	-	LEVEL GAUGE MAGNETIC (SS)
V	1	50	160	600	WN	RF	SEE DWG	-	VENT
H 1-2	2	200	80	600	WN	RF	690	110X T	HANDHOLES + BF + GASKET
P1	1	50	160	600	WN	RF	SEE DWG	-	PI PRESSURE INSTRUMENT
UC	1	50	160	600	WN	RF	590	-	UTILITY CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES HOLD

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)
फॉउन्डेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES 'B' UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90° APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. NOZZLES SHOWN WITH BLIND FLANGES SHALL BE PROVIDED WITH BOLTS/NUTS AND GASKETS.
12. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
13. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190°C WITH VESSEL OPEN.
14. VENDOR SHALL CARRY OUT COMPLETE MECHANICAL DESIGN AS PER CODE & IBR AND MODIFY THE THICKNESS, IF NECESSARY, WITHOUT ANY COST AND TIME IMPLICATION. HOWEVER, INDICATED THK. ARE MINIMUM TO BE PROVIDED. IT IS SOLE RESPONSIBILITY OF VENDOR TO GET APPROVAL OF ALL DOCUMENTS & DESIGN CALCULATION FROM CIB & AI AND ALSO GET THE EQPT. INSPECTED BY CIB & AI.
15. ALL MATERIAL / FABRICATION / TESTING (INCLUDING HYDROTEST) / INSPECTION SHALL MEET IBR & CODE REQUIREMENTS.
16. ALL PRESSURE BEARING WELDS SHALL BE CHECKED BY MP/DP TESTED AFTER HYDROTEST.
17. WELD FOR ALL PRESSURE BEARING COMPONENTS SHALL BE FULL PENETRATION WELD.
18. ALL CIRCUMFERENTIAL, LONGITUDINAL WELDS SHALL BE WELD FROM BOTH SIDE. WHEREVER WELDING IS NOT POSSIBLE FROM OTHER SIDE FIRST TWO (2) ROOT RUNS SHALL BE CARRIED OUT BY TIG.
19. HYDROTEST SHALL BE CARRIED OUT AS PER IBR & CODE REQUIREMENTS.
20. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC. FOR SURFACE PREPARATION & PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
	MANHOLE WITH DAVIT	7-12-0010
	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
X	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
X	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

NOZZLE ORIENTATIONS	
LADDERS/PLATFORM CLEATS	NOT APPLICABLE
PIPE SUPPORT CLEATS	NOT APPLICABLE
TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES L1A-B & L2A-B
X	NOZZLE ELEVATIONS L1A-B & L2A-B		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
	INSULATION THICKNESS		PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	IBR & ASME SEC. VIII DIV.I ED.2023
WORKING PRESSURE (kg/cm²g)	38
DESIGN PRESSURE (kg/cm²g)	INT. 46 EXT. F.V
WORKING TEMPERATURE (°C)	247.8
DESIGN TEMPERATURE (°C)	420
MDMT (°C)	1.1
CORROSION ALLLOWANCE (MM)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
RADIOGRAPHY	SHELL AS PER IBR/CODE HEAD SINGLE PIECE
POST WELD HEAT TREATMENT	YES (NOTE-20)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	-
SP. GRAVITY	0.8022
WIND SPECIFICATION	IS-875 (PART-3)
SEISMIC	SITE SPECTRA + IS-1893 (PART-4)
CAPACITY (M³)	0.84
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-12)
INSULATION THICKNESS (mm) (IH)	80 [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[X] YES [ ] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	AS PER IBR & CODE
INSPECTION BY	[ ] EIL [X] CIB [X] TIA/AI (B)

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 GR.70
REINFORCEMENT PAD	SA 516 GR.70
HEADS	SA 516 GR.70
SHELL FLANGES/SR/LWN	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR. B
NOZZLE NECK ABOVE 250 NB	-
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS304 METAL WINDING & GRAFOIL FILLER WITH CS OUTER RING & SS304 INNER RING AS PER ASME B16.20
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	-
~~SKIRT~~/PIPE SUPPORT	SA 106 GR. B
~~SKIRT/~~ SUPPORT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70
INTERNAL PARTS (BOLTED)	-
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70
WRAPPER PLATE	-
DEMISTER/GRID	-
PAD FOR EXTERNAL ATTACHMENT	SA 516 GR.70
PIPE DAVIT	-
VACUUM STIFFENER	-
LIFTING LUG	SA 516 GR.70

U-CODE STAMPED

PIPE, PLATFORM & LADDER CLIPS NOT TO BE SUPPORTED ON THE EQUIPMENT

SPECIAL SERVICE : IBR

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

[X] **INDIAN BOILER REGULATIONS (IBR)**

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	2000	OPERATING	2500
HYDROTEST(SHOP)	2850	HYDROTEST (FIELD)	2850
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

REV	DATE	REVISION	BY	CHECKED	APPROVED
B	08.12.2025	REVISED & REISSUED FOR BIDS / ENGG.	AS	CRG/VIVEK	PB
A	04.12.2025	ISSUED FOR BIDS / ENGG.	AS	CRG/VIVEK	PB

DESIGN DATA
XYLENE COLUMN REBOILER CONDENSATE POT

ITEM NO. 303-VV-VW-3609

डिजाइन डाटा
जाइलीन कालम
रेबोइलर कन्डेन्सेट पॉट

आइटम नम्बर 303-वीवी-वीडब्ल्यू-3609

DRAWING NUMBER / डाईग नम्बर: **B957-303-80-42-DS-3121** REV: B

SHEET 1 OF 2

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297

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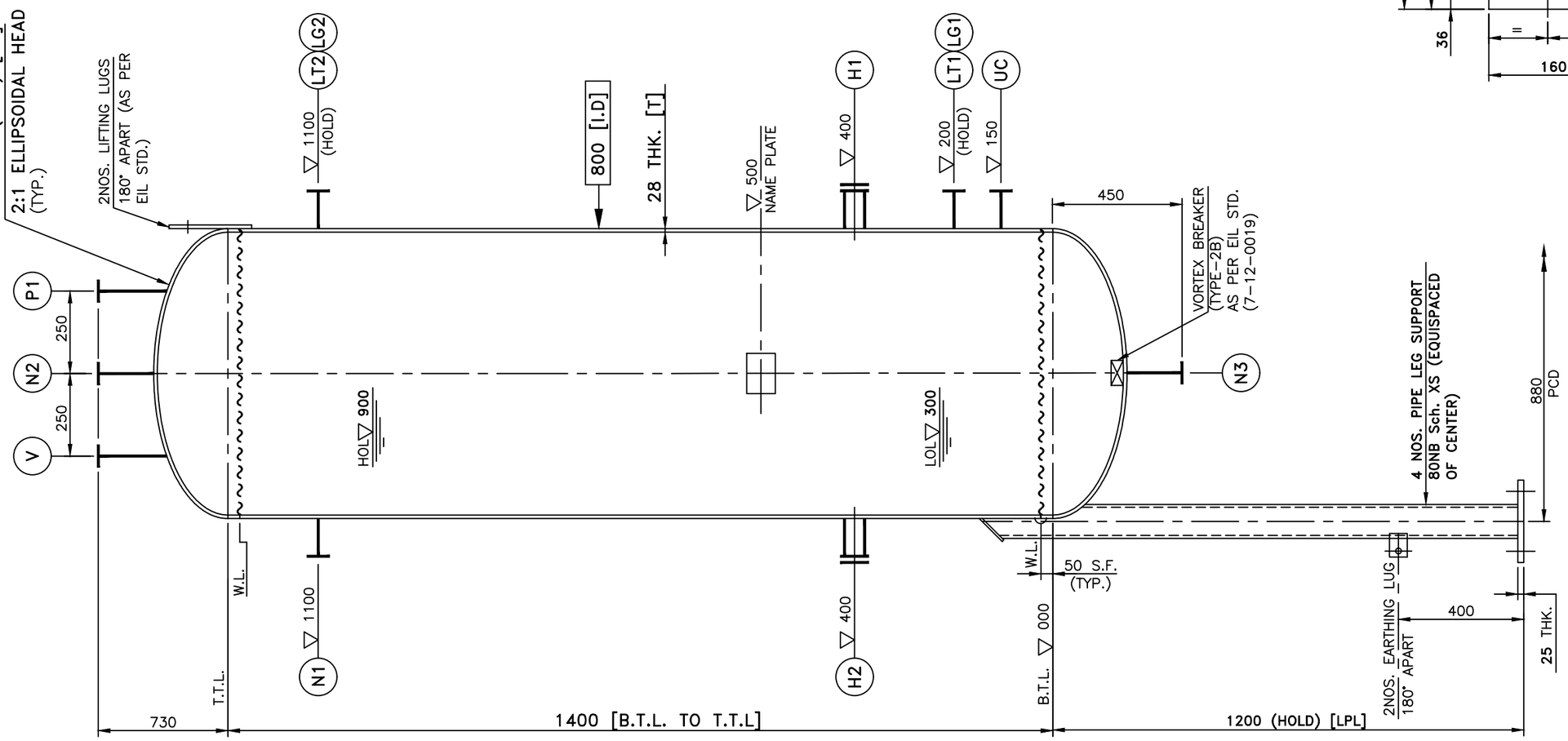

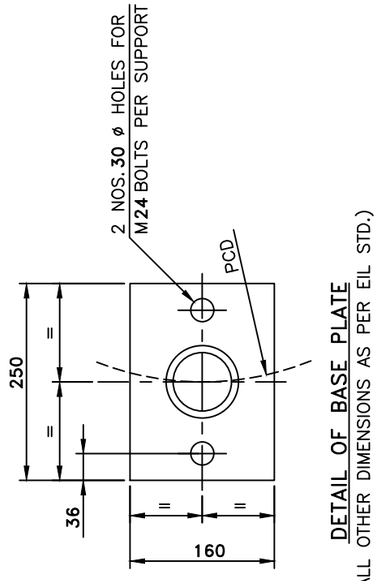

DETAIL OF BASE PLATE
(ALL OTHER DIMENSIONS AS PER EIL STD.)

ENGINEERS INDIA LIMITED
NEW DELHI

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL &
REFINERY EXPANSION
PROJECT (BPREP)

REV.	DATE	REVISION	BY	CHK	APPROVED	APPROVED
B	08.12.2025	REVISED & REISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	
A	20.11.2025	ISSUED FOR BIDS/ENGG.	AS	CRG/VIVEK	PB	

VESSEL DESIGN DATA
XYLENE COLUMN
REBOILER CONDENSATE
POT
ITEM NO. 303-VV-VW-3609

वेसेल डिजाइन डाटा
जाइलीन कालम्
रेबोइलर कन्डेन्सेट
पॉट
आइटम नम्बर 303-वीवी-वीडब्ल्यू-3609

DRAWING NO.	REV.
B957-303-80-42-DS-3121	B
SHEET 2 OF 2	

1-1641-0503 REV.0 A3-420x297

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PDS REV.1

NOZZLES AND CONNECTIONS (नोजल व कनैक्शन)

MARK	QTY	NOM. DIA	SCH./THK.	FLANGES			PROJECTION NOTE-4	PAD W x T	SERVICE
		नामिनल	शड्यूल व	CLASS	TYPE	FACING			
मार्क	क्वान्टिटी	डांया	थिकनैस	क्लास	टाईप	फेसिंग	प्रोजेशन	पैड	सर्विस
N1	1	250	80	150	WN	RF	720	135xT	GAS INLET
N2	1	250	80	150	WN	RF	SEE DWG.	135xT	GAS OUTLET
N3	1	80	160	300	WN	RF	SEE DWG.	-	CONDENSATE OUTLET
LT 1-2	2	50 (H)	160	300	WN	RF	670	-	LEVEL TRANSMITTER (GWR)
LG 1-2	2	50 (H)	160	300	WN	RF	670	-	LI LEVEL GAUGE MAGNETIC (SS)
M	1	500	12 THK.	150	WN	RF	760	250xT	MANWAY + BF + DAVIT + GASKET
P1	1	50	160	300	WN	RF	670	-	PI PRESSURE INSTRUMENT
T	1	50	160	300	WN	RF	670	-	TI TEMPERATURE INSTRUMENT
UC	1	50	160	300	WN	RF	670	-	STEAM OUT
V1	1	50	160	300	WN	RF	SEE DWG.	-	VENT
V2	1	50	160	300	WN	RF	670	-	PSV CONNECTION

T' DENOTES CORRESPONDING SHELL/DISH END NOMINAL THICKNESS

'H' DENOTES (HOLD)

LICENSOR'S SPECIFICATION
लाईसेन्सर स्पेसिफिकेशन्स

FOUNDATION LOADING DATA (OPERATING CONDITION)(HOLD)
फॉउंडेशन लोडिंग डाटा (ऑपरेटिंग कनडिशन)

TYPE	MAX MOMENT AT BASE (M) (kgm)	MAX. SHEAR FORCE AT BASE (H) (kg)
SEISMIC	-	-
WIND	-	-

GENERAL NOTES (जनरल नोट्स)

UNLESS STATED OTHER WISE

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. ALL ANCHOR BOLT HOLES TO STRADDLE N/S CENTRE LINE.
3. NORTH DIRECTION WHEREVER SHOWN IS WITH RESPECT TO PLAN VIEW.
4 (A). FOR NOZZLES ON SHELL PROJECTIONS ARE REFERRED FROM VESSEL CENTER LINE TO FLANGE CONTACT FACE.
4 (B). FOR NOZZLES ON HEAD PROJECTIONS ARE REFERRED FROM HEAD T.L TO FLANGE CONTACT FACE.
5. THE INDICATED THICKNESS IS THE MINIMUM ACCEPTABLE AFTER CONSTRUCTION.
6. FLANGE GASKET FACE SHALL HAVE 125 AARH FINISH.
7. DIMENSIONS OF FLANGES FOR NOZZLES UPTO 600NB SHALL BE AS PER ASME B16.5 AND FOR NOZZLE ABOVE 600NB SHALL BE AS PER ASME B16.47 SERIES B UNLESS SPECIFIED OTHERWISE.
8. ID OF WELD NECK FLANGES SHALL MATCH WITH CORRESPONDING ID OF NOZZLE PIPE/SHELL.
9. NOZZLES 50NB AND BELOW SHALL BE STIFFENED WITH 2 NOS. 40 x 6 THK FLATS 90º APART.
10. ALL FABRICATED NOZZLES SHALL BE 100% RADIOGRAPHED.
11. SURFACE PREPARATION, SHOP PRIMER & FINISH PAINT AS PER JOB SPECIFICATION FOR SURFACE PREPARATION AND PROTECTIVE COATING IS IN VENDOR'S SCOPE.
12. ALL REMOVABLE INTERNALS SHALL BE SEIZED SO AS TO PASS THROUGH NEAREST MANHOLE.
13. UNLESS OTHERWISE SPECIFIED MINIMUM THICKNESS OF WELDED INTERNAL & BOLTED INTERNAL SHALL BE 12mm. IN CASE OF PIPE AND PIPE FITTINGS SCHEDULE TO BE SELECTED ACCORDINGLY.
14. VESSEL SHALL BE SUBJECTED TO STEAM OUT CONDITIONS OF 0.5 Kg/Cm²(g) AT 190ºC WITH VESSEL OPEN.
15. DEMISTER SHALL BE AS PER PDS REFER EIL SPEC. 6-14-0017.
16. 2 NO. OF LIFTING LUGS SHALL BE DESIGNED & PROVIDED BY VENDOR ON VESSEL SHELL FOR COMPLETE EQUIPMENT WEIGHT CONSIDERING AN IMPACT FACTOR OF 1.5. THE INDUCED STRESS IN SHELL & LUG SHALL BE WITHIN 90% OF YIELD.
17. PROVIDE ELECTRIC TRACING (BY OTHERS) UPTO HOL CONSIDERING SOLVENT FREEZING POINT AT 10 °C.
18. COMPLETE EQUIPMENT SHALL BE POST WELD HEAT TREATED. HARDNESS OF BASE METAL, WELDS AND HAZ AFTER PWHT SHALL BE LIMITED TO VALUES SPECIFIED IN 6-15-0091.
19. ALL BUTT WELD (CIRCUMFERENTIAL AND LONGITUDINAL SEAMS) IN PRESSURE PART INCLUDING NOZZLE NECK TO FLANGE, PIPE TO PIPE, PIPE TO PIPE FITTING SHALL BE 100% RADIOGRAPHED.

SPECIFICATIONS (स्पेसिफिकेशन्स)

X	DENOTES APPLICABLITY	
X	GENERAL SPEC. FOR PRESSURE VESSELS	6-12-0001
X	SUPP. SPEC. FOR CS VESSELS	6-12-0002
X	STD. SPEC. FOR BQCS PLATE	6-12-0011
X	STD. SPEC. FOR STRUCTRAL QUALITY PLATES	6-12-0014
X	SPEC.FOR SURFACE PREPARATION&PROTECTIVE COATING	B957-000-06-42-PLS-01

STANDARDS (स्टैण्डर्डस)

X	VESSEL TOLERANCES	7-12-0001
	SUPPORT FOR HORIZONTAL VESSEL	7-12-0002
	WOODEN PILLOWS FOR SADDLE SUPPORT	7-12-0003
	SKIRT BASE DETAILS	7-12-0004
	SKIRT OPENING DETAILS	7-12-0005
	ANGLE LEG SUPPORT	7-12-0006
X	PIPE LEG SUPPORT	7-12-0007
	BRACKET SUPPORT FOR VERTICAL VESSEL	7-12-0008
	MANHOLE WITH HINGED COVER	7-12-0009
X	MANHOLE WITH DAVIT	7-12-0010
X	LADDER RUNGS FOR MANHOLE/DEMISTER	7-12-0011
	RETAINING PLATE	7-12-0012
X	NOZZLE REINFORCEMENT AND PROJECTION	7-12-0013
	PAD NOZZLES FOR VESSELS	7-12-0014
X	STANDARD BOLT HOLE ORIENTATION	7-12-0015
	ALLOY LINER DETAILS	7-12-0016
	SIGHT GLASSES FOR PRESSURE VESSELS	7-12-0017
	INTERNAL FLANGES	7-12-0018
	VORTEX BREAKERS	7-12-0019
	INLET DEFLECTOR BAFFLE	7-12-0020
	SUPPORT RING AND BOLTING BAR	7-12-0021
	SUPPORT RING SIZES FOR PACKED TOWERS	7-12-0022
	PIPE DAVIT	7-12-0023
X	LIFTING LUG TOP HEAD TYPE	7-12-0024
	FIRE PROOFING AND INSULATION SUPPORTS	7-12-0025
X	EARTHING LUG	7-12-0026
X	NAME PLATE	7-12-0027
X	MANUFACTURER NAME PLATE	7-12-0028
X	BRACKET FOR NAME PLATE	7-12-0029
X	NAME PLATE FOR SMALL EQUIPMENT	7-12-0030
	DETAILS OF FORGED NOZZLES	7-12-0031
	SUPPORTS FOR INTERNAL FEED PIPE	7-12-0032
	HOT INSULATION SUPPORT FOR HORIZONTAL VESSEL	7-12-0033
	PIPE DAVIT SUPPORT FOR COLD INS. VESSELS	7-12-0034
X	TYP. DETAILS OF WIRE MESH DEMISTER SUPPORTS	7-12-0036
	S.R NOZZLE NECK	7-12-0037
X	ALLOWABLE NOZZLE LOADS	7-12-0038

REFERENCE DRAWINGS(रेफरेन्स डाईग)

	NOZZLE ORIENTATIONS	
	LADDERS/PLATFORM CLEATS	
	PIPE SUPPORT CLEATS	
	TRAY SUPPORT AND BOLTING BARS	NOT APPLICABLE
X	PROCESS DATA SHEET	B957-303-79-41-DS-1222

HOLD UPS (होल्ड अप्स)

X	NOZZLE ORIENTATIONS	X	SIZE OF NOZZLES (LT1-2 & LG1-2)
X	NOZZLE ELEVATIONS (AS MARKED)		PIPE SUPPORT CLEATS
X	SUPPORT HEIGHT		LADDER/PLATFORM CLEATS
	DETAILS OF INTERNALS		TRAY SUPPORT/BOLTING BARS
			PIPE DAVIT
			PACKING SUPPORT

DESIGN DATA (डिजाइन डाटा)

CODE	ASME SECTION VIII DIV-1 ED.2023
WORKING PRESSURE (kg/cm²g)	3.9
DESIGN PRESSURE (kg/cm²g)	INT. 7.5 EXT. -
WORKING TEMPERATURE (°C)	40
DESIGN TEMPERATURE (°C)	150
MDMT (°C)	1.1
CORROSION ALLOWANCE (mm)	3
TYPE OF HEAD	2:1 ELLIPSOIDAL
JOINT EFFICIENCY	SHELL 1 HEAD 1
RADIOGRAPHY	SHELL FULL HEAD FULL
POST WELD HEAT TREATMENT	YES (NOTE-18)
HEAT TREATMENT	HEAD: AS PER CODE / SPEC.
OPERATING MEDIUM	MP CONDENSATE
SP. GRAVITY	0.8655/0.0037 (L/V)
WIND SPECIFICATION	IS-875
SEISMIC	SITE SPECTRA + IS-1893
CAPACITY (M³)	2.3
PAINTING/CLEANING	AS PER JOB SPECIFICATION (REFER NOTE-11)
INSULATION THICKNESS (mm)	50 (H) [X] HOT [ ] COLD
FIRE PROOFING CLEATS	[ ] YES [X] NO
HYDROSTATIC TEST (kg/cm2g)	HORIZONTAL / VERTICAL (AT TOP)
PRESSURE (NEW & COLD)	9.75
INSPECTION BY	[X] EIL [ ] CIB [X] TPIA/AI

MATERIAL OF CONSTRUCTION (मैटिरियल ऑफ कन्सट्रक्शन)

(AS PER ASME / IS ~~OR EQUIVALENT~~)

SHELL	SA 516 GR.70
REINFORCEMENT PAD/INSERT PLATE	SA 516 GR.70
HEADS	SA 516 GR.70
SHELL FLANGES	-
NOZZLE FLANGES	SA 105
NOZZLE NECK UPTO 250 NB	SA 106 GR.B
NOZZLE NECK ABOVE 250 NB	SA 516 GR.70
PIPE FITTINGS	SA 234 GR. WPB
GASKET EXTERNAL	SPIRAL WOUND GASKET WITH SS 304
	METAL WINDING AND GRAFOIL FILLER
	MATERIAL WITH CS OUTER & SS 304
	INNER RING AS PER ASME B 16.20.
GASKET INTERNAL	-
EXTERNAL STUDS/BOLTS/NUTS	SA 193 GR.B7 / SA 194 GR.2H
INTERNAL STUDS/BOLTS/NUTS	SS 304
~~SKIRT~~/SUPPORT	SA 106 GR.B
~~SKIRT~~/SUPPRT BASE	IS 2062 GR. E 250 QUALITY BR/B0
INTERNAL PARTS (WELDED)	SA 516 GR.70/SA 106 GR.B
INTERNAL PARTS (BOLTED)	SA 516 GR.70/SA 106 GR.B
CLIPS & ATTACHMENTS (EXTERNAL)	SA 516 GR.70/IS 2062 GR. E 250 QUALITY BR/B0
WRAPPER PLATE	-
DEMISTER/GRID	SS 410
PAD FOR EXTERNAL ATTACHMENTS	SA 516 GR.70
LIFTING LUG	SA 516 GR.70

ASME U-CODE STAMPED

NO PLATFORM AND LADDER CLIPS TO BE ATTACHED ON VESSEL

SPECIAL SERVICE : AROMATIC/BENZENE

STATUTORY REGULATIONS (स्टैचुअरी रेगुलेशन्स)

INDIAN BOILER REGULATIONS (IBR)

DEPARTMENT OF EXPLOSIVES, NAGPUR (CCOE)

APPROXIMATE WEIGHT (kgs) (PER ITEM) (एपरौक्सिमेंट वजन)

ERECTION	2100	OPERATING	3200
HYDROTEST(SHOP)	4400	HYDROTEST (FIELD)	4600
NUMBER OF ITEMS :	ONE		

ENGINEERS INDIA LIMITED
NEW DELHI
इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)

BHARAT PETROLEUM CORP. LTD.
BINA PETROCHEMICAL & REFINERY EXPANSION PROJECT (BPREP)

Signature Not Verified
Digitally signed by ARITRA DE
Date: 2026.05.18 17:02:19 IST
Location: eProcure-EPROC

REV	DATE	REVISION	BY	CHECKED	APPROVED
0	10.12.2025	ISSUED FOR BIDS / ENGG.	AS	SSR/SA	PB

DESIGN DATA	डिजाइन डाटा
R[illegible]ENERATION KO DRUM	रिजेनरेशन को ड्रम
ITEM NO. 303-VV-VI-3610	आइटम नम्बर 303-वीवी-वीआई-3610

DRAWING NUMBER डाईग नम्बर	REV
B957-303-80-42-DS-3122	A
SHEET 1 OF 2	

FORMAT NO.3-8042-0501 REV.0 (28.02.2024) A3-420 X 297