

SUPPLY OF ANHYDROUS AMMONIA TANK WITH ITS ACCESSORIES AS PER BELOW MENTIONED SPECIFICATIONS & ANNEXURES.

1. Technical Specification - TSR: 041
2. Valve Schedule - 1727/VS/ST
3. P&ID of SCR system - Ammonia Storage Tank 0-SR-056-00051
4. Details of Nozzle N2
5. Details of Nozzle N10
6. Details of Nozzle N11
7. Layout of Ammonia Storage Tank
8. Data sheet of Ammonia Storage Tank
9. Painting Scheme

NOTE:

Bidder shall submit Quality Plan (QP) for the ammonia tank with its accessories along with the technical offer. The QP will be subject to review by BHEL/QA department and further by our collaborator (M/s BPE) for correctness and completeness. Final acceptance will be given based on the review and the same should be followed by bidder for manufacture of ammonia tank.

BHARAT HEAVY ELECTRICALS LIMITED

TIRUCHIRAPPALLI-620 014

Fuel Systems/PE(FB)



Title Sheet

Technical Purchase Specification for
Anhydrous Ammonia storage tank

Specification No.: TSR:041/1727

Revision No.: 00

<i>Rev. No.</i>	<i>Rev. Date</i>	<i>Clause</i>	<i>Description</i>	<i>Chd.</i>	<i>Appd.</i>
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	<i>Name</i>	<i>Signature</i>	<i>Date</i>
<i>Prepared</i>	<i>D Balaji</i>	<i>Sd.,</i>	<i>24.03.2021</i>
<i>Checked</i>	<i>Srinivas Arugula</i>	<i>Sd.,</i>	<i>24.03.2021</i>
<i>Approved</i>	<i>G. Saravanakumar</i>	<i>Sd.,</i>	<i>24.03.2021</i>



Specification for
Anhydrous Ammonia storage tank

TSR : 041/1727

Revision No.:00

Table of Contents

1.0	Scope.....	3
2.0	Equipment, Material and Services by Vendor	3
3.0	Equipment, Material and services by others	4
4.0	Performance Guarantees	4
5.0	Detailed Requirements of Equipment	5
5.1	General.....	5
5.2	Terminal Points	5
5.3	Industry Reference Documents (Codes and Standards)	5
5.4	Surface Preparation and Painting	6
5.5	Documents submitted by Vendor.....	7
5.6	Equipment Marking	7
5.7	Field Service	8
6.0	REFERENCE DOCUMENTS.....	8
7.0	Annexure- 1.....	9
8.0	Annexure- 2.....	10



Specification for **Anhydrous Ammonia storage tank**

TSR : 041/1727

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1.0 Scope

This specification defines the minimum requirements for the design, manufacture, testing, preparation for shipment and delivery of materials, engineering documentation, technical direction for construction/ installation, and startup service for this equipment.

The anhydrous ammonia tanks are components of the ammonia handling system, which supplies ammonia to the ammonia pumps for injection of ammonia into the flue gas stream during operation of the SCR.

2.0 Equipment, Material and Services by Vendor

The Vendor scope of supply includes, but is not necessarily limited to:

- Two (2) above ground carbon steel horizontal anhydrous ammonia (Vapour 15.0% by volume & 85% Liquid by volume) storage tanks.
- The thermowell shall be as per attached thermo well sketch
- The thermowell shall be made of 304 SS.
- Tank quantity and size as specified in Annexure-2.
- The tank shall be designed, fabricated, and tested in accordance with ASME Boiler & Pressure Vessel Code Section VIII Division 1, (Latest) Edition. Tank shall be made up of ASTM SA516-70 Normalised material. All welds in the tank must be 100% radiographed and stress relieved. Each tank shall be provided with a corrosion protective coating as per specification requirement.
- The tanks shall be PESO - SMPV (U) rules compliant in all aspects.
- Ammonia storage tank shall be transported to site in one piece.
- Saddles and attachment pads for each tank.
- Storage tanks shall be of all-welded steel construction.
- Tank shall have one 24 in. (600 mm) diameter (minimum) manhole in the tank.
- Two (2) nameplates of non-corroding metal permanently attached per UG115 through UG119.
- Nozzles as specified on the attached P&ID in Annexure-3.
- Manway with top-mount davit.
- Provide tank with two NEMA grounding pads, with two holes each. Locate pads just above the base of the tank, 180 degrees apart.
- Internal access ladder at tank manway.
- Lifting lugs and base supports.
- Drop pipe at nozzle N2 " Liquid Fill " vacuum breaker hole above high liquid level as necessary. Refer N2 nozzle sketch.
- Markings as listed in this document.
- Safety/Hazardous Material Notices



Specification for Anhydrous Ammonia storage tank

TSR : 041/1727

Revision No.:00

- Stress Calculations per ASME
- Tank shall have redundant and independent level indication (DP and Column type by others).
- Tank should be fully in compliance with specification.
- Adherence to delivery dates is required to maintain schedule.
- Equipment are to be completed by the Vendor in order to inform the BHEL as to the specifics of the equipment being supplied.
- Copper, zinc, tin, nickel, monel, silver, cadmium or any copper alloys including brass are not permitted for use within this Specification.
- Special tools required. For example, if a special lifting device is required during shop fabrication, the device must be available on the construction site for installing that piece of equipment. Vendor to inform the details to purchaser.
- Freight from fabrication site(s) to the job site, including customs duties, if applicable.

BHEL shall supply nozzle loads in all directions to Vendor. Vendor shall confirm loads are acceptable to tank design.

3.0 Equipment, Material and services by others

The scope of supply by others shall be:

- Unloading and storage at the job site.
- Foundations and anchor bolts.
- Installation.
- Dyke containment system.
- Process piping external to the Vendor's supplied equipment.
- DCS interface and remote alarms.

4.0 Performance Guarantees

The equipment provided by the Vendor shall operate in accordance with the performance data sheet.

The equipment shall meet all applicable code requirements so that all required inspections are passed and permits obtained.

The BHEL and/or Customer may conduct Field tests during startup and after commercial operation of the installation for a period determined by the terms and conditions of purchase.

The vendor shall maintain a quality assurance program complying with ASME Boiler and Pressure Vessel Code Section I. The vendor shall establish a program that controls quality for all parts of the work of this specification, including that which is outside of the scope of ASME Boiler and Pressure Vessel Code Section I.



Specification for
Anhydrous Ammonia storage tank

TSR : 041/1727

Revision No.:00

5.0 Detailed Requirements of Equipment

5.1 General

- The tanks are horizontal, cylindrical vessels fitted with two saddles for mounting on flat concrete foundations. Bearing of saddles shall extend over at least one-third of the shell circumference. Horizontal expansion is to be considered for the temperature range given in the data sheet.
- Calculations and engineering by Vendor shall include basic and detail design, stress calculations, flotation and foundation loads.
- Copper, zinc, tin, nickel, monel, silver, cadmium or any copper alloys including brass are not permitted for use within this Specification.
- After completion of all welding to the tanks, each tank shall be post weld heat treated in accordance with the requirements of the ASME Code.
- Welding to the shell, head or any other part of the tank subject to internal pressure shall be in accordance with the ASME Code.
- Each tank shall be tested in accordance with the current ASME Code.
- The tank shall be designed, fabricated, and tested in accordance with ASME Boiler & Pressure Vessel Code Section VIII Division 1, (Latest) Edition.
- Vendor shall complete the tank design vetting, manufacturing, testing and inspection as governed by PESO.
- Vendor must provide Material Safety Data Sheets (MSDS) for all coatings, paints, lubricants, preservatives, or chemicals that will be brought onto the jobsite by the Vendor for whatever reason. The MSDS's must be delivered before equipment is delivered on the jobsite.
- Vendor shall provide a detailed description of any special lifting and/or installation requirements.

5.2 Terminal Points

Nozzles shall be reinforced with reinforcing pads, if required, according to applicable codes. The fabrication drawings will clearly list all the nozzles, their intended purpose, materials of construction and the welding details for each. The nozzle thickness and weld thickness calculations shall be according to ASME BPV code Section VIII, Division 1. See P&ID, for nozzle schedule.

5.3 Industry Reference Documents (Codes and Standards)

At a minimum, all work performed and materials provided by the Vendor must be in accordance with all applicable central, State and local laws, ordinances, and regulations.

The equipment will comply with the applicable portions of the following Codes and Standards. The applicable revision of each of these Codes and Standards will be the current edition with addenda or the edition adopted by the controlling jurisdiction at the time of the purchase order. In the event of a conflict between these documents and the specification, the Vendor shall submit a written request for an interpretation by BHEL. In general, the most stringent requirement shall govern.



Specification for **Anhydrous Ammonia storage tank**

TSR : 041/1727

Revision No.:00

- American National Standard Institute (ANSI)
- American Society of Testing and Materials (ASTM)
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME)
- Section VIII, Division 1, the ASME Boiler and Pressure Vessel Code (BPVC)
- American Petroleum Institute (API)
- Environmental Protection Agency (EPA)
- International Organization for Standardization (ISO)
- Steel Structures Painting Council (SSPC)
- Standards of Hydraulics Institute (SHI)
- National Fire Protection Agency (NFPA)
- American Welding Society (AWS)
- American Institute of Steel Construction (AISC)
- Occupational Safety and Health Administration (OSHA)
- Joint Industrial Conference (JIC)
- International Building Codes (IBC)
- Petroleum and Safety Organisation (PESO)

The tank manufacturer shall specify the edition, addenda, and safety factor of applicable ASME BPVC Section VIII, Division 1 code to be used for the tank design and fabrication, and shall be responsible to insure that the tank design meets all local, state, and national jurisdiction requirements.

The stress calculations for the tank, external attachment pads and saddles shall include weight of platforms live and dead loads on top of the vessel, the possibility of flotation and the wind and seismic loading in accordance with requirements listed in data sheet.

The above codes set forth the minimum requirements which are to be exceeded if it is required by judgment, superior materials, design or successful and continuous commercial operation needs

5.4 Surface Preparation and Painting

- After completion of the hydrostatic test, the vessels shall be drained, dried, and cleaned inside and outside.
- The inside shall be free of all foreign matter and sealed before shipment.
- Vendor to ensure complete protection suitable for outdoors storage a minimum of six (6) months at various environmental conditions. The equipment constructed of carbon steel shall be surface prepped per SSPC and painted per Vendor's standard on all exposed surfaces to protect against rust and corrosion during the shipping, installation and operation of the equipment (primer and finish paint).
- Vendor shall finish paint all carbon steel surfaces not to be insulated.
- Each tank shall be provided with a corrosion protective coating according to the site conditions.



Specification for Anhydrous Ammonia storage tank

TSR : 041/1727

Revision No.:00

- Ammonia storage tanks shall be painted compulsorily in white colour to minimize heating due to solar radiation. Refer approved painting schedule for details.
- All machined surfaces and connections shall be protected with rust preventive.
- Wood or steel dunnage shall be used to prevent shipping damage.
- All flanged process and instrument connections shall be closed with gasketed steel flanges with a complete set of flange bolts. All threaded connections shall be taped and plugged closed. The test hole shall be protected with silicon grease.

5.5 Documents submitted by Vendor

For Technical evaluation:

- Stress analysis calculations for ammonia tank
- General Arrangement/Outline Drawings/Plans and Elevations
- Foundation Layout, Static and Dynamic Loads and Other Information Required to Design Foundation
- Point wise conformation to specification
- QA documents

After placement of P.O:

- Assembly Drawing with BOM, Nozzle List Location and Details, Name Plate Data
- Mechanical Details and Views including Weights and Dimensions, Supports and Support Locations.
- Stress analysis calculations for ammonia tank
- Storage and Handling Procedures and Requirements
- Operation and Maintenance Manuals
- QA documents
- PESO Certification & Complete documentation

5.6 Equipment Marking

Each tank shall have a nameplate made of non-corrosive metal permanently attached the tank by continuous welding and located so as to be readily accessible. Each tank shall be marked with:

- ASME Code-required markings.
- The tank shall be designed, fabricated, and tested in accordance with ASME Boiler & Pressure Vessel Code Section VIII Division 1, (Latest) Edition.
- Indication that tank is designed for above ground installation.
- Name and address of system supplier or trade name of system and date of system fabrication on system nameplates.
- Minimum and maximum tank design temperatures in degrees C.
- Wall thickness of tank shell and heads in mm.
- Container water capacity in Cu.m at 15°C.
- Container design pressure in Kg/Sq.cm.
- Container outside surface area in Sq.m.
- Other statutory information as per SMPV(U) of PESO.



Specification for
Anhydrous Ammonia storage tank

TSR : 041/1727

Revision No.:00

5.7 Field Service

- At the request of the BHEL, Vendor shall furnish a Field Engineer to provide technical assistance during construction/installation and commissioning.
- For details see general Terms and Conditions.

6.0 REFERENCE DOCUMENTS

S.No	Title	Document
1.	P&ID of SCR system – Ammonia Storage system	0-SR-056-00051 (Annexure -3)
2.	Site & Plant information	Annexure -1
	Tank data sheet	Annexure -2
3	Ammonia Tank sketch	0-SR-100-000A2
4	Nozzle N2 sketch	2-SR-100-000A2
5	Nozzle N10 sketch	3-SR-100-000A3
6	Nozzle N11- Sketch	4-SR-100-000A3
7.	Layout of Ammonia Storage Tank at Ammonia Farm Yard	0-SR-056-00061
8.	Storage Tank Valve Schedule	Annexure-4



Specification for
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TSR : 041/1727
Revision No.:00

7.0 Annexure- 1

Site & Plant Information

1. Ambient Temperature (Design and Guarantee of SG) : 27 Deg C
2. Ambient Temperature range : 13-50 Deg C
3. Relative Humidity : 60%
4. Height above MSL : 210 m
5. Seismic Zone : Zone III As per IS: 1893

6. Wind Data – As per IS:875 (Part-3) :1987
 - a) Basic wind speed : 39 m/s as per IS 875 Part -III
 - b) K1 : 1.07 as per IS:875 Table-1
 - c) K2 : Table 2, Category -2, Class-C



Specification for
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TSR : 041/1727

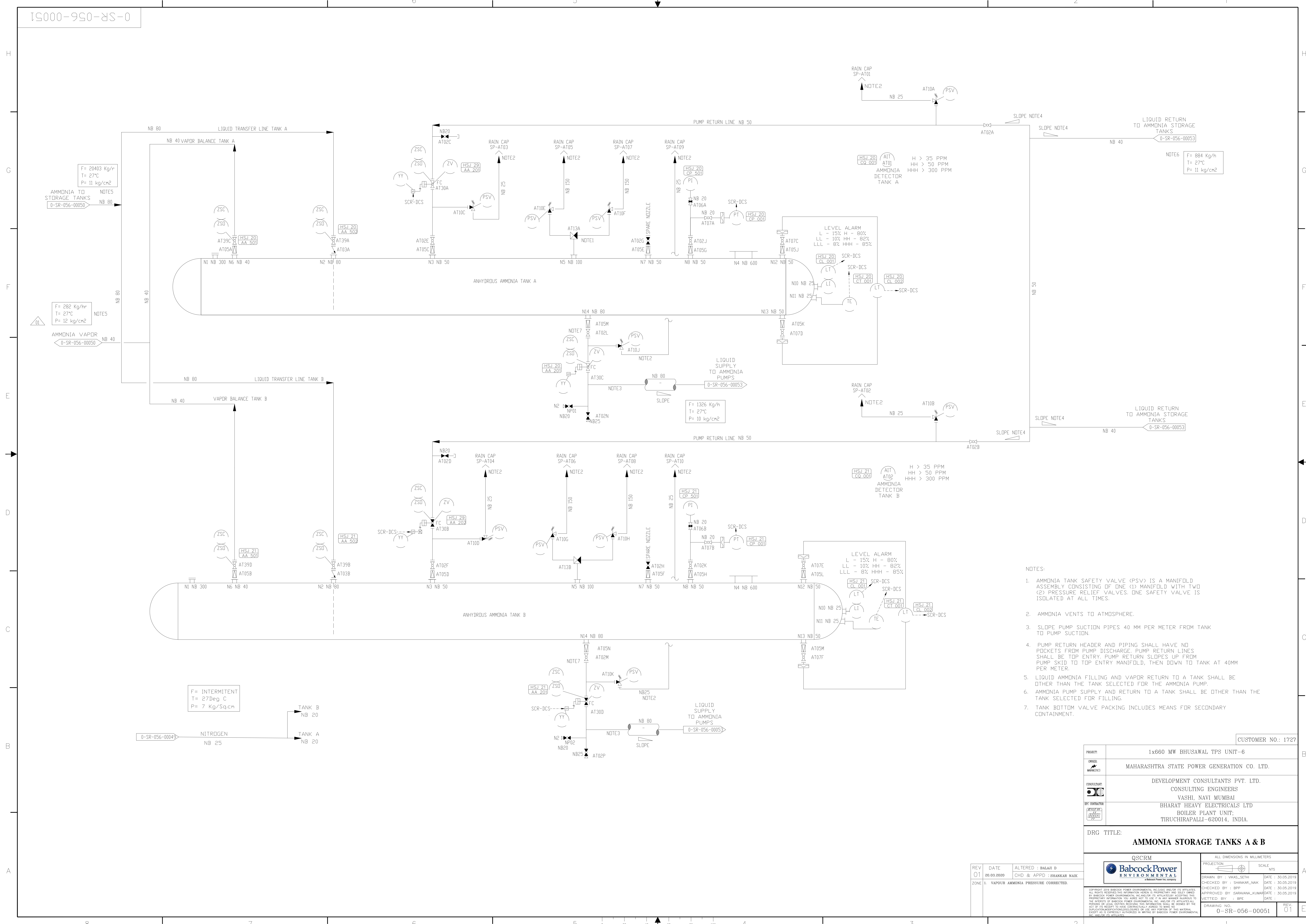
Revision No.:00

8.0 Annexure- 2

Sl.NO	Description	Unit	Requirement
1.	No. of tanks	Nos	2 (Two)
2	Type of tank		Cylindrical/Horizontal
3	Design pressure	Kg/Sq.cm(g)	23
4	Design Vacuum	Kg/Sq.cm(g)	-1
5	Design temperature	Deg C	-33.4 to 55
6	Fraction of vapour/Liquid	%	Vapour 15% Liquid 85%
7	Medium		Commercial grade Anhydrous ammonia
8	Purity of Ammonia	%	99.5(for Gurantee)
9	Volume of the tank	Cu.m	184
10	ID of shell	M	2.944*
11	OD of shell	M	3.000
12	Length of shell	M	25.142
13	Over Tank length	M	28.146#
14	Corrosion allowance	mm	3
15	Thickness of the tank	mm	28*
16	Material		SA516 Gr70 N

*Thickness calculated as per ASME Sec VIII(UG 27) with 100% ligament efficiency and corrosion allowance of 3mm. Vendor to confirm.

#vendor to confirm to meet clause 9.



- NOTES:
1. AMMONIA TANK SAFETY VALVE (PSV) IS A MANIFOLD ASSEMBLY CONSISTING OF ONE (1) MANIFOLD WITH TWO (2) PRESSURE RELIEF VALVES. ONE SAFETY VALVE IS ISOLATED AT ALL TIMES.
 2. AMMONIA VENTS TO ATMOSPHERE.
 3. SLOPE PUMP SUCTION PIPES 40 MM PER METER FROM TANK TO PUMP SUCTION.
 4. PUMP RETURN HEADER AND PIPING SHALL HAVE NO POCKETS FROM PUMP DISCHARGE. PUMP RETURN LINES SHALL BE TOP ENTRY. PUMP RETURN SLOPES UP FROM PUMP SKID TO TOP ENTRY MANIFOLD, THEN DOWN TO TANK AT 40MM PER METER.
 5. LIQUID AMMONIA FILLING AND VAPOR RETURN TO A TANK SHALL BE OTHER THAN THE TANK SELECTED FOR THE AMMONIA PUMP.
 6. AMMONIA PUMP SUPPLY AND RETURN TO A TANK SHALL BE OTHER THAN THE TANK SELECTED FOR FILLING.
 7. TANK BOTTOM VALVE PACKING INCLUDES MEANS FOR SECONDARY CONTAINMENT.

CUSTOMER NO.: 1727	
PRODUCT:	1x660 MW BHUSAWAL TPS UNIT-6
OWNER:	MAHARASHTRA STATE POWER GENERATION CO. LTD.
CONSULTANT:	DEVELOPMENT CONSULTANTS PVT. LTD. CONSULTING ENGINEERS VASHI, NAVI MUMBAI
DRG TITLE:	BHARAT HEAVY ELECTRICALS LTD BOILER PLANT UNIT; THIRUCHIRAPALLI-620014, INDIA.
DRG TITLE: AMMONIA STORAGE TANKS A & B	
QSCRM	
BabcockPower ENVIRONMENTAL	
PROJECTION	ALL DIMENSIONS IN MILLIMETERS.
SCALE	NTS
DRAWN BY : VIKAS_SETHI	DATE : 30.05.2019
CHECKED BY : SHANKAR_NAIK	DATE : 30.05.2019
APPROVED BY : SARAVANA_KUMAR	DATE : 30.05.2019
VETTED BY : BPE	DATE :
DRAWING NO.	REV.
0-SR-056-00051	01

REV	DATE	ALTERED BY
01	20.03.2020	CHD & APPD : SHANKAR NAIK
ZONE	1. VAPOUR AMMONIA PRESSURE CORRECTED.	

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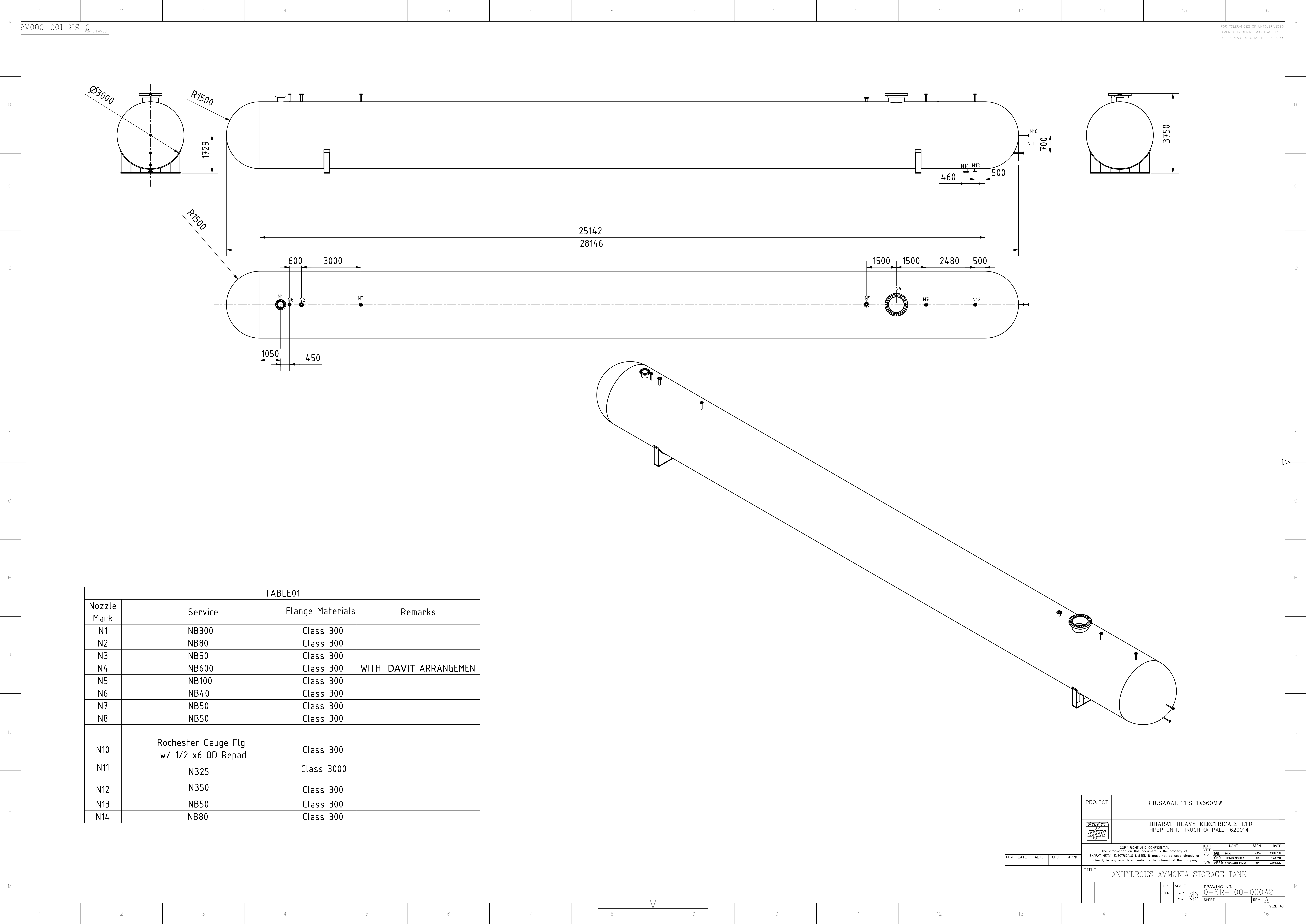
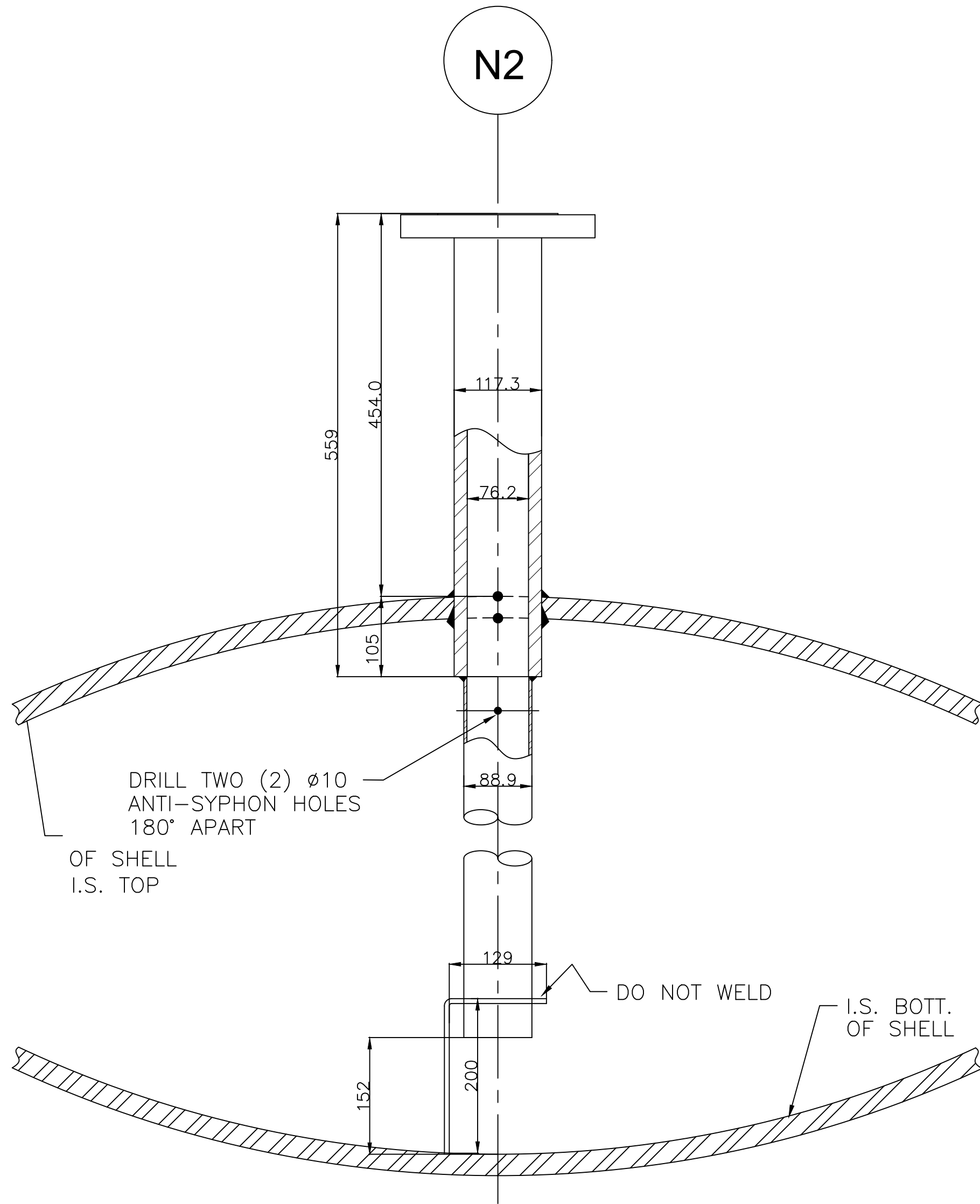


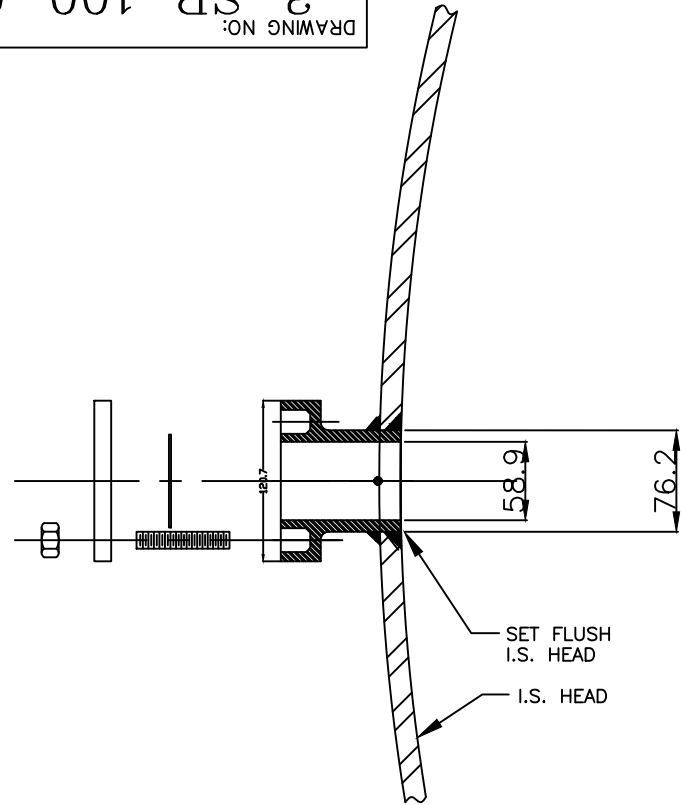
TABLE01			
Nozzle Mark	Service	Flange Materials	Remarks
N1	NB300	Class 300	WITH DAVIT ARRANGEMENT
N2	NB80	Class 300	
N3	NB50	Class 300	
N4	NB600	Class 300	
N5	NB100	Class 300	
N6	NB40	Class 300	
N7	NB50	Class 300	
N8	NB50	Class 300	
N10	Rochester Gauge Flg w/ 1/2 x6 OD Repad	Class 300	
N11	NB25	Class 3000	
N12	NB50	Class 300	
N13	NB50	Class 300	
N14	NB80	Class 300	

PROJECT		BHUSAWAL TPS 1X660MW			
		BHARAT HEAVY ELECTRICALS LTD HPBP UNIT, TIRUCHIRAPPALLI-620014			
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REV.	DATE	ALT	CHD	APPD	
TITLE		ANHYDROUS AMMONIA STORAGE TANK			
DEPT.		SCALE		DRAWING NO.	
SIGN				0-SR-100-000A2	
				SHEET	
				REV. A	
				SIZE-A0	

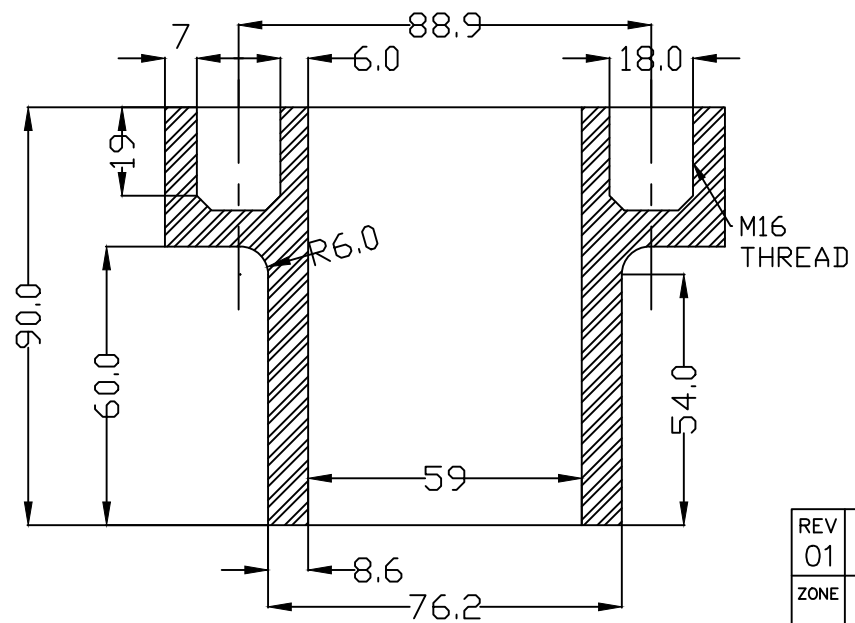
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		Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI – 620014			DRN	NAME	SIGNATURE	DATE
					CHD			
					APPD			
	355-054							
DEPT FS/PE	ALL DIMENSIONS ARE IN MM	 PROJECTION	SCALE ---	WEIGHT (Kg)	REF TO ASSY / OLD DWG			
CODE 129								
TITLE NOZZLE-N2					DRAWING NO : 2-SR-100-000A2			REV A

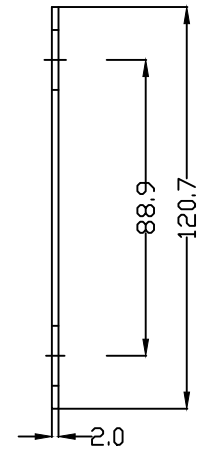
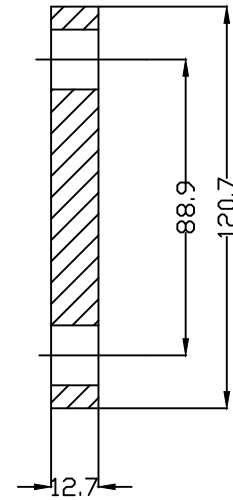
DRAWING NO: 3-SR-100-000A3



DETAIL OF OPENING "N10" (2" - ROCHESTER FLANGE ADAPTER)



REV 01	DATE	ALTERED :
		CHD & APPD:
ZONE		



FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD.NO TP 023 0299

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	SS		
					VAR NO	MATERIAL SPECN	DI	QUANTITY				

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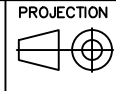
TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



355-055

DEPT
FS/PECODE
129

ALL
DIMENSIONS
ARE IN MM



SCALE

WEIGHT (Kg)

DRN

CHD

APPD

NAME _____

SIGNATURE

DATE _____

Bharat Heavy Electricals Ltd

UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI – 620014

NOZZLE-N10

DRAWING NO :

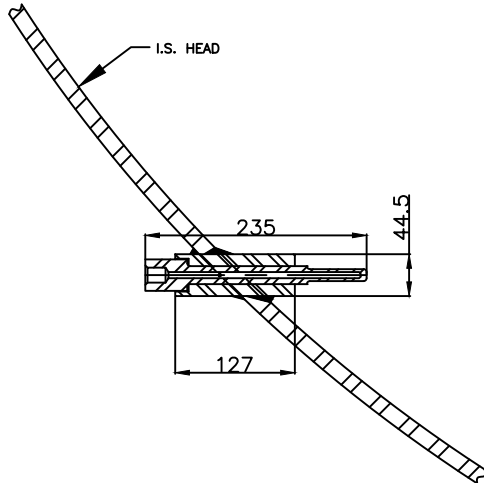
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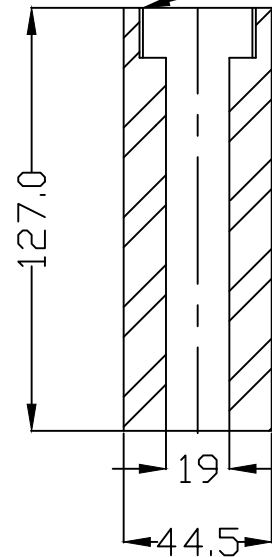
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REV 01	DATE	ALTERED :
		CHD & APPD :

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD. NO TP 023 0299



M33X2;L-15mm



DETAIL OF
OPENINGS "N11"

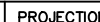
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			MATERIAL SPECN			QUANTITY

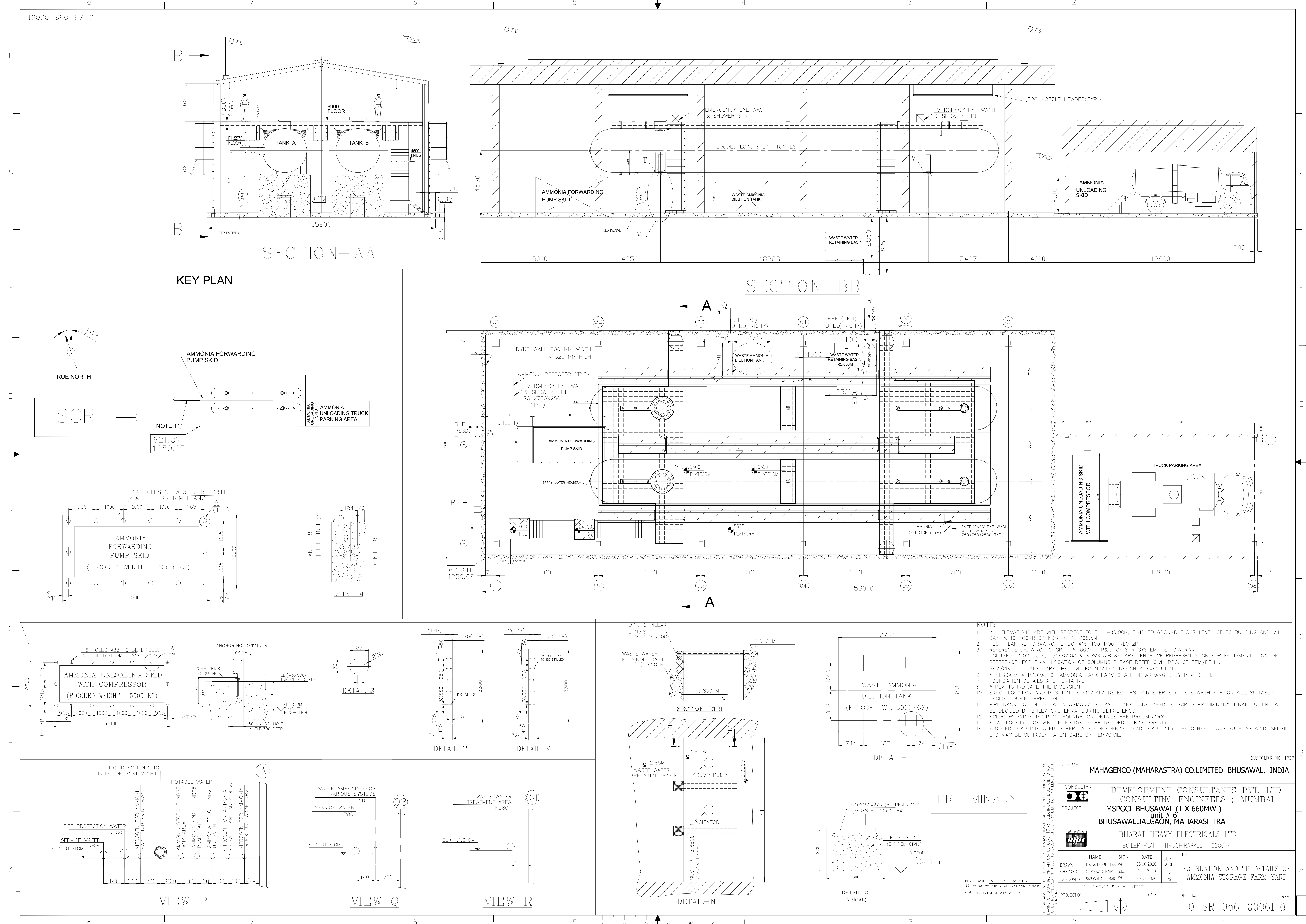


355-056

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME	SIGNATURE	DATE
CHD			
APPD			

DEPT FS/PE	ALL DIMENSIONS ARE IN MM		SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG		
CODE 129							
TITLE NOZZLE N11					DRAWING NO : 4-SR-100-000A3		REV A





VALVE SCHEDULE FOR SCR AMMONIA 6725\$.

MAHARASTRA STATE POWER GENERATION COMPANY LIMITED

BHUSAWAL THERMAL POWER STATION :: 1 X 660 MW

CUSTOMER NO: 1727

REFERENCE P&ID NUMBER : 0-SR-056-000

	NAME	SIGNATURE	DATE	DOCUMENT NO: 1727 / V667 SHEET: 01 OF 0	REV:00
PREPARED	BALAJI D	-sd-	27/5/2020		
CHECKED	PREETAM KUMAR S	-sd-	28/5/2020		
APPROVED	SHANKAR NAIK V	-sd-	29/5/2020		

SCHEDULE OF VALVES AND FITTINGS

CUSTOMER : M/S MAHAGENCO

PROJECT: BHUSAWAL THERMAL POWER PLANT UNIT 6 - 1X660 MW

	CUST. NO :1727
--	----------------

LEGEND

[illegible]

1727 BHUSAWAL VALVE SCHEDULE

TAG NO	SERVICE DESCRIPTION	VALVE TYPE	SIZE	OPERATION	PRESS	TEMP	BODY MAT	BODY RATING	END CONN	MAKE	QTY	Remarks
AT02J	INST ISOL (PT)	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT05J	EXCESS FLOW (TANK-A LEVEL INDICATOR)	EXCESS FLOW	50	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT07C	LEVEL TRANSMITTER ISOL	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT05K	EXCESS FLOW (TANK-A LEVEL INDICATOR)	EXCESS FLOW	50	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT07D	LEVEL TRANSMITTER ISOL VLV	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT02L	AMMONIA LIQ SUPPLY ISOL	BALL	80	HAND	12.0	27	CS	C300	300F	SD	1	
AT10F	PRESSURE RELIEF VLV	ANGLE RELIEF	150	SELF	12.0	27	CS	C300	300F	BHEL	1	Set pr. 28 kg/cm2(g)
AT02N	NG PRG DRN ISOL	BALL	25	HAND	7.0	27	CS	C300	SW	SD	1	
NP01	NG PRG ISOL	BALL	20	HAND	7.0	27	CS	C800	SW	SD	1	
AT30C	LIQ TRIP VLV -TANK A	BALL	80	PNM	12.0	27	CS	C300	300F	SD	1	
AT05P	EXCESS FLOW (PUMP-A INLET)	EXCESS FLOW	80	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT10A	PRESSURE RELIEF VLV	ANGLE RELIEF	25	SELF	12.0	27	CS	C300	300F	BHEL	1	Set pr. 28 kg/cm2(g)
AT02A	LIQ RET ISOL	BALL	50	HAND	12.0	27	CS	C800	SW	SD	1	
AT07A	PG INST ISOL	BALL	20	HAND	12.0	27	CS	C800	SW	SD	1	
AT30B	LIQ TRIP VLV	BALL	50	PNM	12.0	27	CS	C300	300F	SD	1	
AT39D	VAPOR BALANCE RET ISOL	BALL	40	HAND	12.0	27	CS	C800	SW	SD	1	with LSO and LSC
AT05B	EXCESS FLOW (TANK-B VAPOR BALNCE)	EXCESS FLOW	40	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT39B	LIQ TRANSFER ISOL	BALL	80	HAND	12.0	27	CS	C300	300F	SD	1	with LSO and LSC
AT03B	LIQ TRANSFER CHECK VLV	NRV	80	SELF	12.0	27	CS	C300	300F	SD	1	
AT02F	PUMP RET ISOL VLV	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT05D	EXCESS FLOW (TANK-B PUMP RETUEN LINE)	EXCESS FLOW	50	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT10D	PRESSURE RELIEF VLV	ANGLE RELIEF	25	SELF	12.0	27	CS	C300	300F	BHEL	1	Set pr. 22.8 kg/cm2(g)
AT02D	AMMONIA LIQ DRN	BALL	20	HAND	11.0	27	CS	C300	SW	SD	1	
AT10G	PRESSURE RELIEF VLV	ANGLE RELIEF	150	SELF	12.0	27	CS	C300	300F	BHEL	1	Set pr. 28 kg/cm2(g)

1727 BHUSAWAL VALVE SCHEDULE

AT13B	3-WAY VLV	3 WAY	100	HAND	12.0	27	CS	C300	300F	SD	1	
AT10H	PRESSURE RELIEF VLV	ANGLE RELIEF	150	SELF	12.0	27	CS	C300	300F	BHEL	1	Set pr. 22.8 kg/cm2(g)
AT02H	SPARE NOZZLE ISOL	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT05F	EXCESS FLOW (TANK-B SPARE NOZZLE)	EXCESS FLOW	50	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT05H	EXCESS FLOW (TANK-B PT)	EXCESS FLOW	50	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT02K	AMMONIA LIQ ISOL	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT07B	PG INST ISOL	BALL	20	HAND	12.0	27	CS	C800	SW	SD	1	
AT05L	EXCESS FLOW (TANK-B LEVEL INDICATOR)	EXCESS FLOW	50	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT07E	LEVEL TRANSMITTER ISOL	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT05M	EXCESS FLOW (TANK-B LEVEL INDICATOR)	EXCESS FLOW	50	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT07F	LEVEL TRANSMITTER ISOL	BALL	50	HAND	12.0	27	CS	C300	300F	SD	1	
AT05N	EXCESS FLOW (PUMP-B INLET)	EXCESS FLOW	80	SELF	12.0	27	SS	C300	WAFER	SD	1	
AT02M	AMMONIA LIQ SUPPLY ISOL	BALL	80	HAND	12.0	27	CS	C300	300F	SD	1	
AT10K	PRESSURE RELIEF VLV	ANGLE RELIEF	25	SELF	12.0	27	CS	C300	300F	BHEL	1	Set pr. 28 kg/cm2(g)
AT30D	LIQ TRIP VLV - TANK B	BALL	80	PNM	12.0	27	CS	C300	300F	SD	1	
AT02P	NG PRG ISOL	BALL	25	HAND	7.0	27	CS	C300	SW	SD	1	
NP02	NG PRG ISOL	BALL	20	HAND	7.0	27	CS	C800	SW	SD	1	
AT10B	PRESSURE RELIEF VLV	ANGLE RELIEF	25	SELF	12.0	27	CS	C300	300F	BHEL	1	Set pr. 28 kg/cm2(g)
AT02B	LIQ RET ISOL	BALL	50	HAND	12.0	27	CS	C800	SW	SD	1	

PAINTING SCHEME

For Anhydrous Ammonia Storage tank, surface preparation to blast cleaning Sa2.5 (surface profile 25- 30 μ m), three component epoxy based zinc rich primer (90% by weight of zinc dust pigment in its dry film) DFT 75 μ minimum and water based acrylic urethane finish paint, DFT 2x50 μ minimum, white shade. Total DFT is 175 μ .