



PRODUCT STANDARD

PULVERISERS

HYDERABAD

Product
STD no.

BA89041

Rev No. 00

Page 1 of 4

Complete set of wear resistant rubber lining system for Wet Ball Mill

1.0 APPLICATION: Limestone grinding Wet Ball Mills of Flue Gas Desulfurization unit.

2.0 TECHNICAL:

This specification governs the procurement of complete set of wear resistant rubber lining system (SBR based rubber) for Wet Ball Mill. Set of liner shall include shell liner, feed end head liners, discharge end head liners along with necessary hardware for fixing arrangement.

Lifter bars have to be fastened to the shell by means of clamp block (which slide into the grooves provided at the underside of the lifter bars), washers and nuts. The fastening system shall be leak-proof and designed to utilize rubber flexibility to the maximum & 6 mm thick rubber backing shall be provided along with standard adhesive.

Diameter of mill shell (ID) 2900 mm

Length of mill shell 5000 mm

Technical properties of Rubber compound shall be as indicated below:

Hardness : 62 (± 5) shore A

Tensile strength : 155 Kg/sq cm (minimum)

Elongation at break : 500-700%

Din abrasion loss : 80 mm³ (maximum)

Specific gravity : 1.12 (± 0.005)

Withstand temp. : below 80° C

pH of slurry : upto 11

Ball charge size 100 mm (maximum)

Liner thickness 65 mm; Lifter bar dim 165 mm x 160 mm

The mill dimensions are indicated in Annexure III, IV & V. Lay out of liners & pitching for fasteners of the liners shall be provided by the vendor. Two man-holes are provided at each end of the shell. Vendor shall supply suitable manhole doors lined with rubber liners such that the door can be removed without disturbing the other liners.

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3.0 GUARANTEES:

- 3.1 The minimum guaranteed wear life shall be 8000 hours (without repair or reversal of liners) for the lime stone as specified in Annexure-I.
- 3.2 The supplier shall give back to back guarantee for wear life of liners
In case of short fall, supplier shall make one to one replacement of liners to meet guaranteed wear life
- 3.3 Failure due to manufacturing defects (generally leading to breakage/catastrophic failure of liners elements) shall be replaced and installed immediately.

4. QUANTITY REQUIRED PER MILL

- 1) Complete set of liners for shell (with inspection door), Feed end (Cheek), discharge end (cheek), Mill shell as per the drawing in Annexure III, IV & V.
- 2) 6 mm back up rubber material with adhesive required for the same
- 3) Hardware for fastening of liners.

5. MANUFACTURING PROCESS AND QUALITY PLAN:

- a. A detailed manufacturing process (along with the process control parameters) and manufacturing and test facilities data shall be submitted for review by BHEL.
- b. Material used for the manufacture of the liners shall be specified along with the technical details. The details of the patented portion of the technology need not be provided, however the generic name of the proven patented technology along with the broad details shall be provided.
- c. A Quality plan with stage wise inspection and acceptance criteria shall be submitted for approval by BHEL and/or customer.
- d. The PROCESS CONTROL shall consist of 100% testing the quality of mixed compound in a Rheometer to ensure that each batch is consistent with the proper proportion of each ingredient of the compound so as to result in a correct and standard quality of product to give desired results in installations.

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6. INSPECTION:

- a. The inspection of liners will be as per the approved quality plan
- b. Tests and inspection are to be conducted in the presence of BHEL/ customer representatives as per approved Quality plan. The representatives shall have free access at all times while the work on the contract is being performed. The supplier shall offer all the tools and tackles required for inspection to the inspection agency.

7. TEST CERTIFICATE:

All the liners shall be identified with a serial number. Supplier shall supply 3 copies of Test certificates with following information for each set:

1. BHEL order number.
2. Supplier's reference and name.
3. Batch Heat No.
4. Results of Hardness Test and all other tests or any other tests as per approved QAP.
5. Drawing no., Material Code.
6. Consignment/ Identification no.

8. PACKING:

Liners shall be suitably packed in metallic boxes set wise to prevent damage during transit. Metallic surfaces shall be properly protected with suitable anti-corrosive compound. Each package shall be legibly marked with following information.

1. BHEL Order No.
2. Consignment/ Identification No.
3. Set No.
4. Drawing no., Material Code
5. Weight in Kg
6. Suppliers Name

9. SUPERVISION & SERVICES:

Personnel for supervision for Erection and commissioning shall be deputed within a period of one week from the notice given by BHEL.

Deputation period is 7 days / set

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TABLE FOR MATERIAL CODE

Var No.	Mill Type	Item Description	Malt. Code
01	2950	Liners of Wet Ball Mill	BA9789041004

List of Annexures


Annexure No.	Description	Remarks
I	LIMESTONE ANALYSIS / PROPERTIES	
II	WATER ANALYSIS	
III	SHELL DRAWING	06221500036-S00-R01
IV	CHEEK DE	06221500021-S00-R00
V	CHEEK NDE	06221500022-S00-R00

RECORD OF REVISION

REV. NO	DATE	REVISION DETAILS	REVISED	APPROVED

Mounting arrangement for sealing system at feed and discharge liners on cheek with trunnion (DE and NDE) Inner diameter shall be provided during detailing stage. The same shall be incorporated in the respective liner drawing.

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	PROJECT	NTPL 2x500 MW PROJECT, TUTICORIN – FGD SYSTEM PACKAGE
	FGD	WET LIMESTONE BASED FGD SYSTEM
	PARAMETERS	ANNEXURE - I

2.0 LIMESTONE ANALYSIS/CHARACTERISTICS

The following limestone property to be used designing Limestone grinding system



Tender Specification
for
FGD Package

NLC Tamil Nadu Power Ltd.
2x500 MW Project
Tuticorin, Tamil Nadu

TABLE-VII

PROPERTIES OF LIMESTONE

Limestone is proposed to be brought by Trucks to the plant. The limestone size is expected to be (-) 250 mm.

1.	CaO	%	47.5-51.0
2.	MgO	%	0.9-2.0
3.	Fe ₂ O ₃	%	0.45-1.0
4.	Al ₂ O ₃	%	1.19-2.1
5.	Si ₂ O ₃	%	2.1-4.5
6.	Mn ₂ O ₃	%	<0.12
7.	P ₂ O ₃	%	Traces
8.	Cl ₂	%	<0.015
9.	Na ₂ O	%	<0.16
10.	K ₂ O	%	<0.01
11.	TiO ₂	%	<0.02
12.	Total Sulphur	%	<0.1
13.	LOI	%	39.0-41.3

Physical Properties:

1.	Bond Index	kWh/t	13
2.	Granule size		Medium




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Vol. II-A/Section-IX
Salient Design Data

Project: NTPL 2x500 MW PROJECT, TUTICORIN - FGD SYSTEM PACKAGE

Cont No: G515 & G516		Rev 00		Rev 01		Rev 02	
		Sign	Date	Sign	Date	Sign	Date
Engineer	MVR	-sd-	21.07.2020				
Reviewer	PNR/ ACR	-sd-	21.07.2020				
Approver	RSB	-sd-	21.07.2020				

	PROJECT	NTPL 2x500 MW PROJECT, TUTICORIN – FGD SYSTEM PACKAGE
	FGD	WET LIMESTONE BASED FGD SYSTEM
	PARAMETERS	ANNEXURE - II

3.0 WATER ANALYSIS

The following water to be used during the grinding process of limestone in Lime stone grinding system (LGS)



Tender Specification
for
FGD Package

NLC Tamil Nadu Power Ltd.
2x500 MW Project
Tuticorin, Tamil Nadu

TABLE-II

TREATED WATER/ FGD PROCESS WATER QUALITY

Sr. Number	Item	Unit	Value
1.	<u>TDS of permeate from Desalination RO System</u>	ppm	<500
2.	Total Suspended solids	ppm	Nil
3.	Iron as Fe	ppm as Fe	<0.1
4.	Reactive Silica as SiO ₂	ppm as SiO ₂	<1.0
5.	Chloride as Cl	ppm as Cl	<200
6.	Sodium	ppm as Na	<150
7.	pH at 25 deg C	—	6.0-7.0



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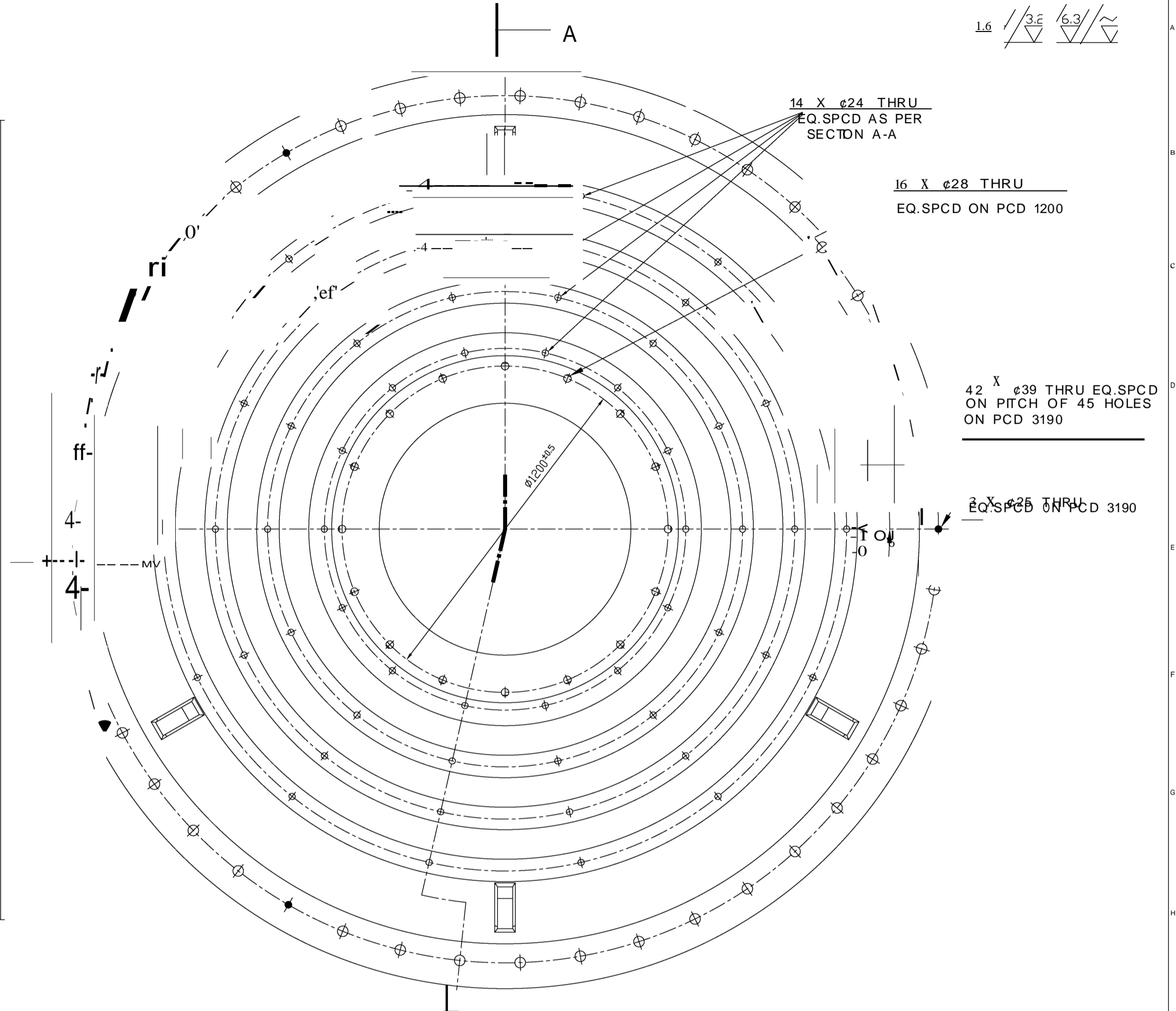
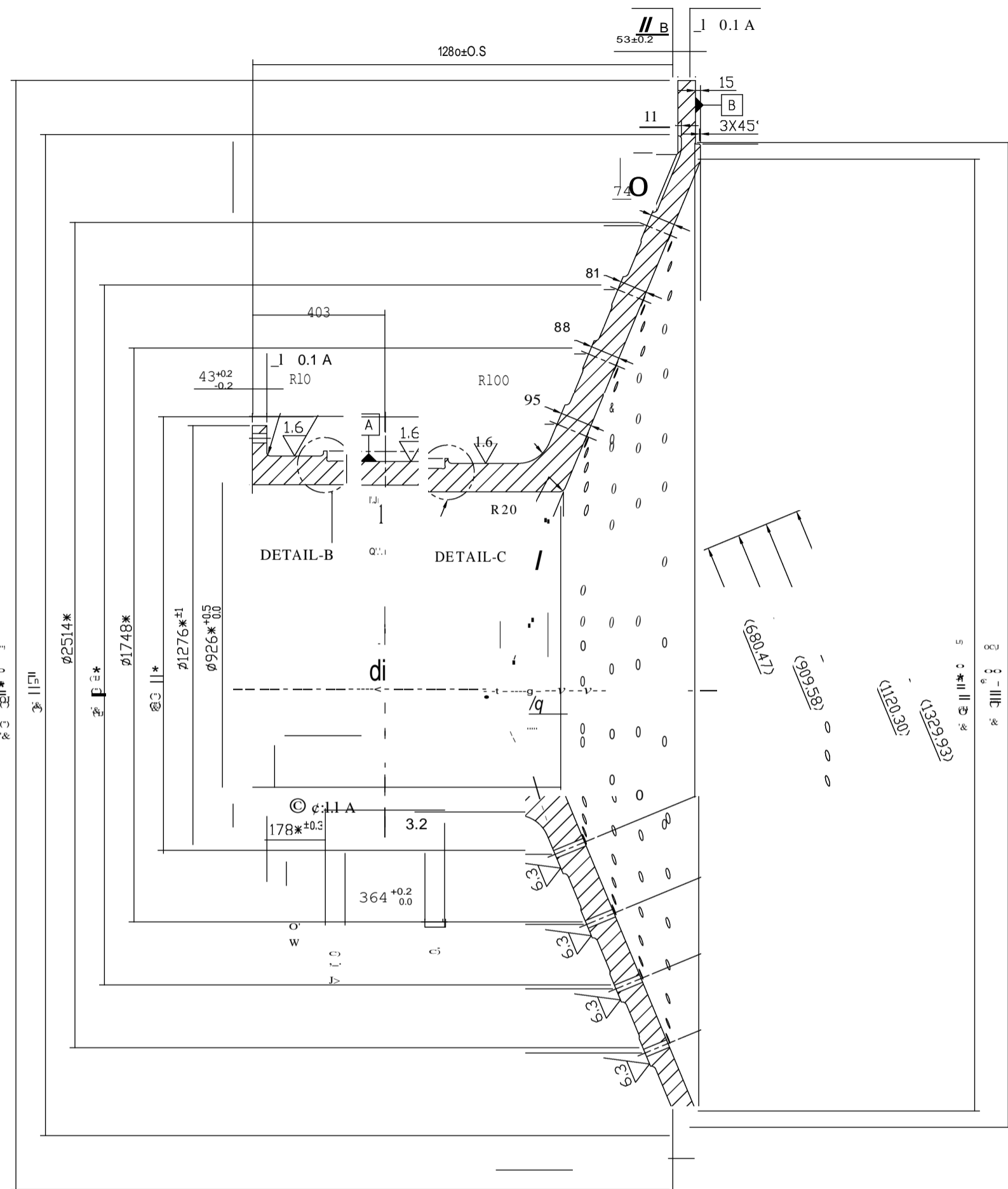
Vol. II-A/Section-IX
Salient Design Data

Project: NTPL 2x500 MW PROJECT, TUTICORIN - FGD SYSTEM PACKAGE

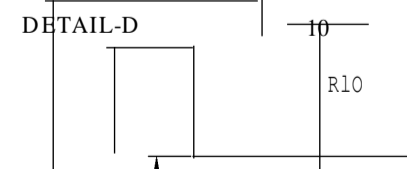
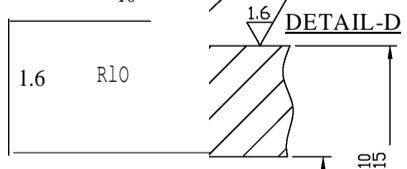
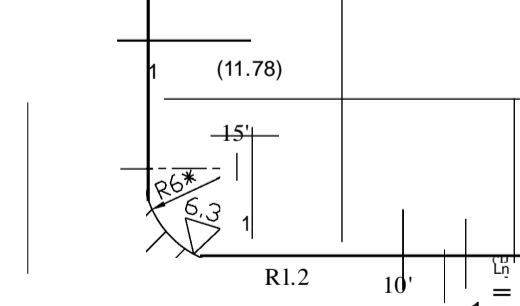
Cont No: G515 & G516		Rev 00		Rev 01		Rev 02	
		Sign	Date	Sign	Date	Sign	Date
Engineer	MVR	-sd-	21.07.2020				
Reviewer	PNR/ ACR	-sd-	21.07.2020				
Approver	RSB	-sd-	21.07.2020				



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SECTION A-A

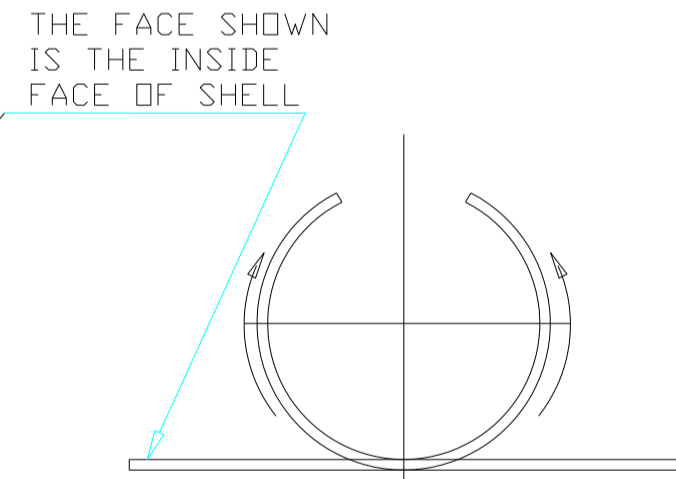
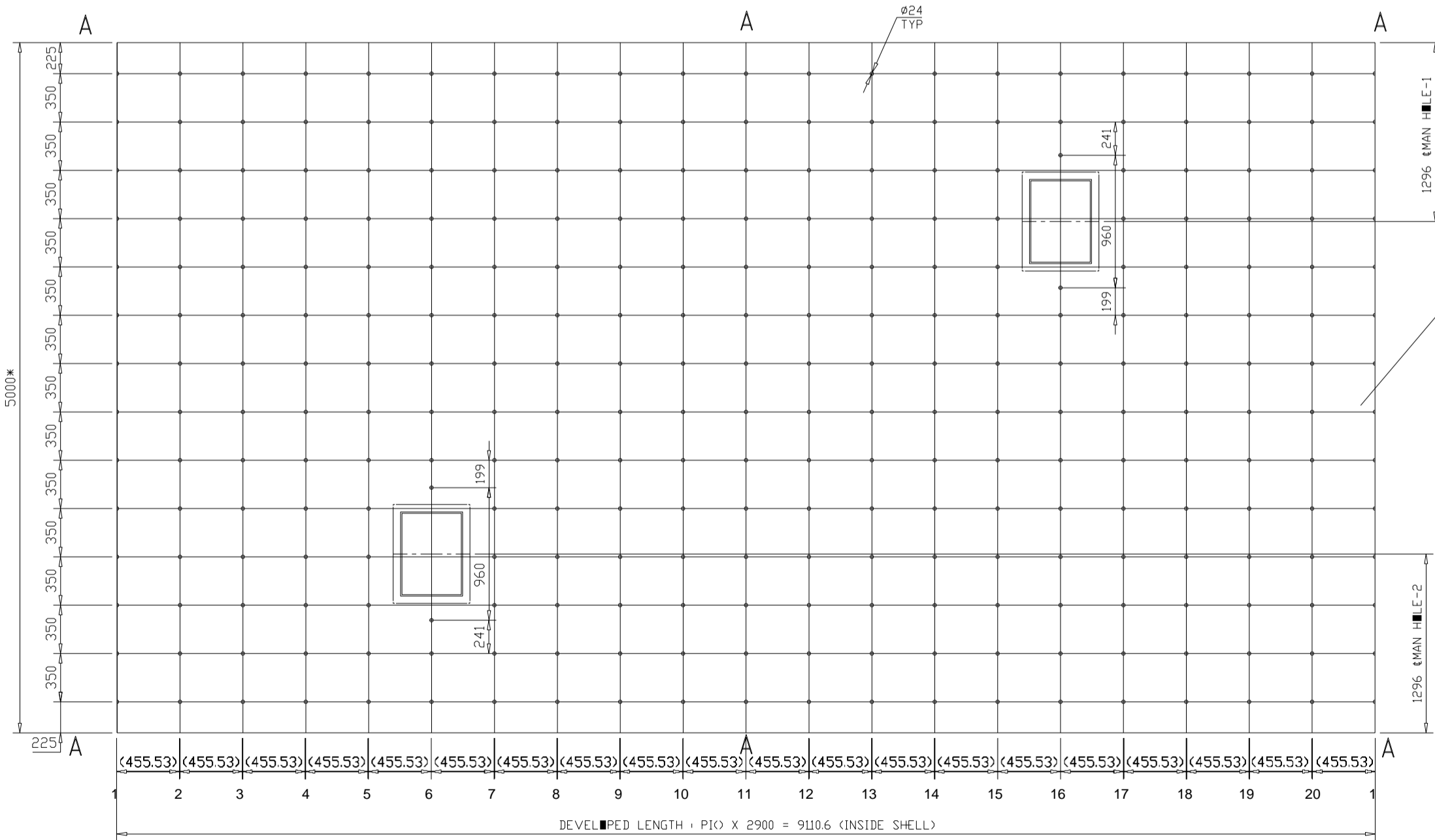
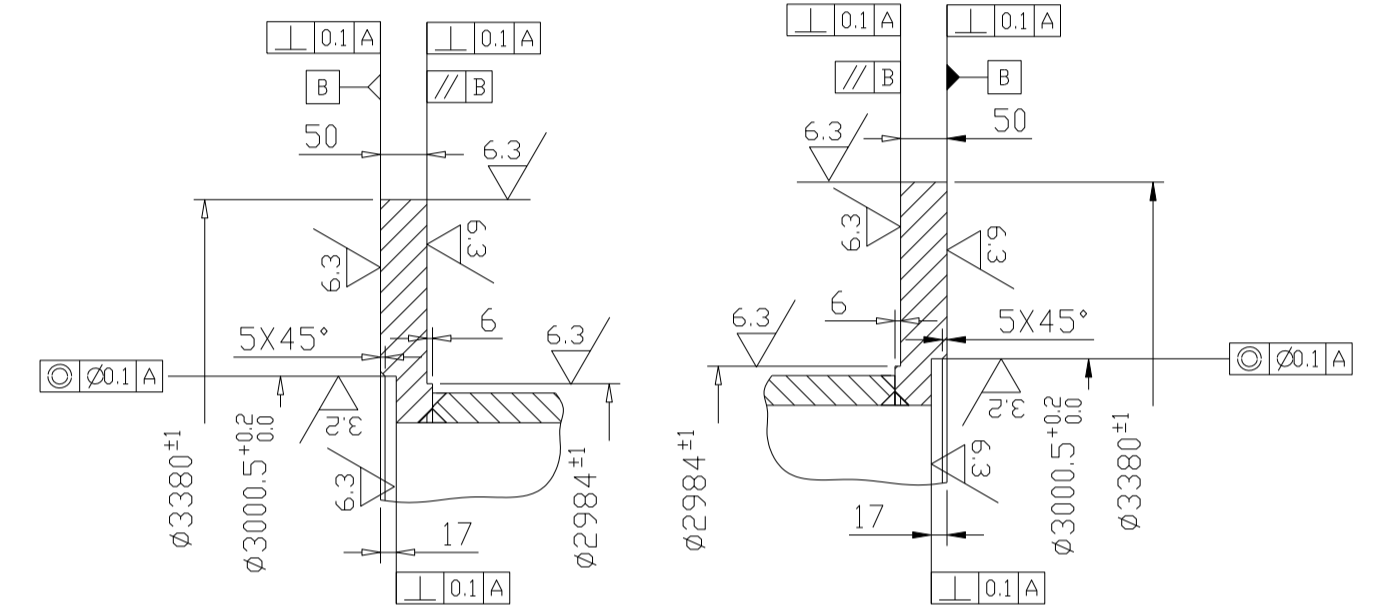
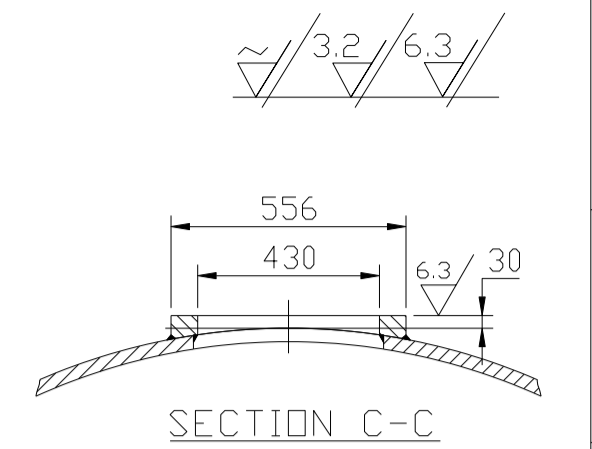
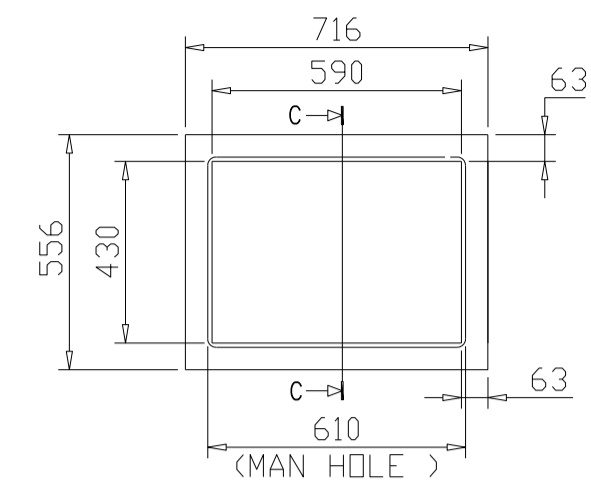
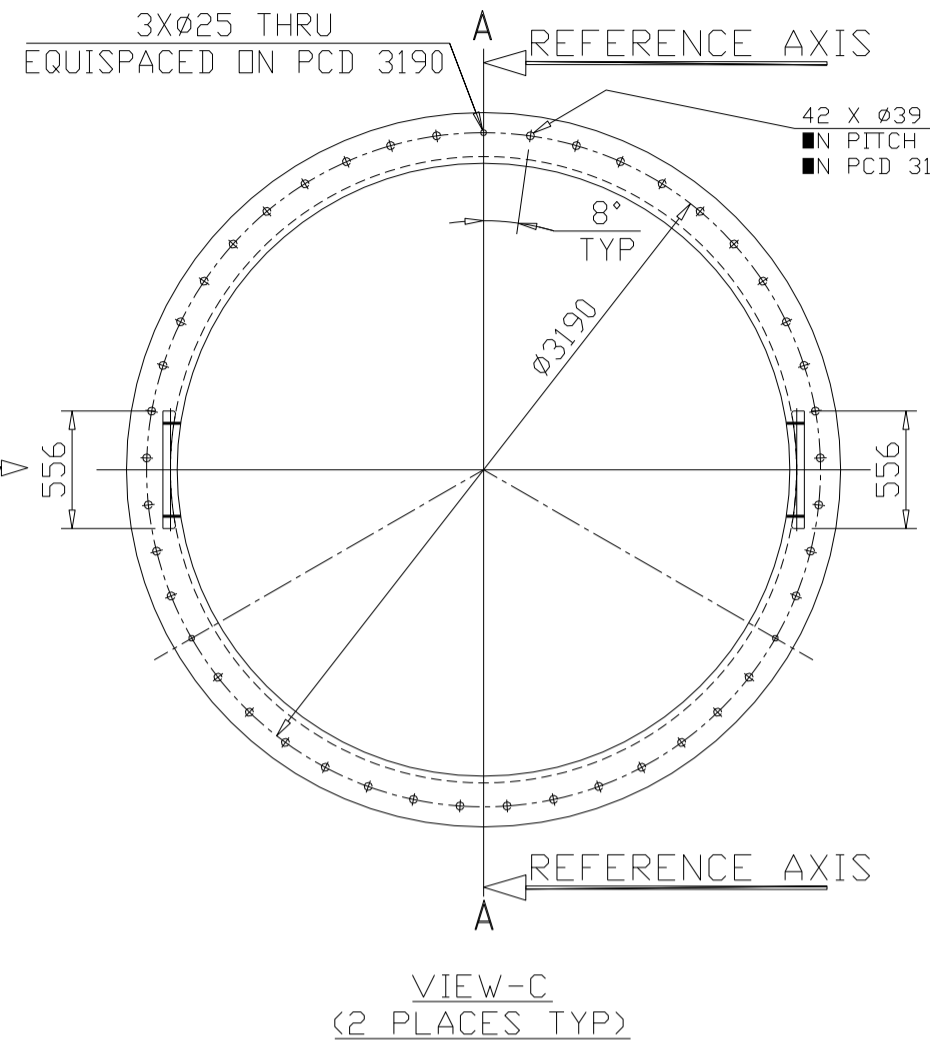
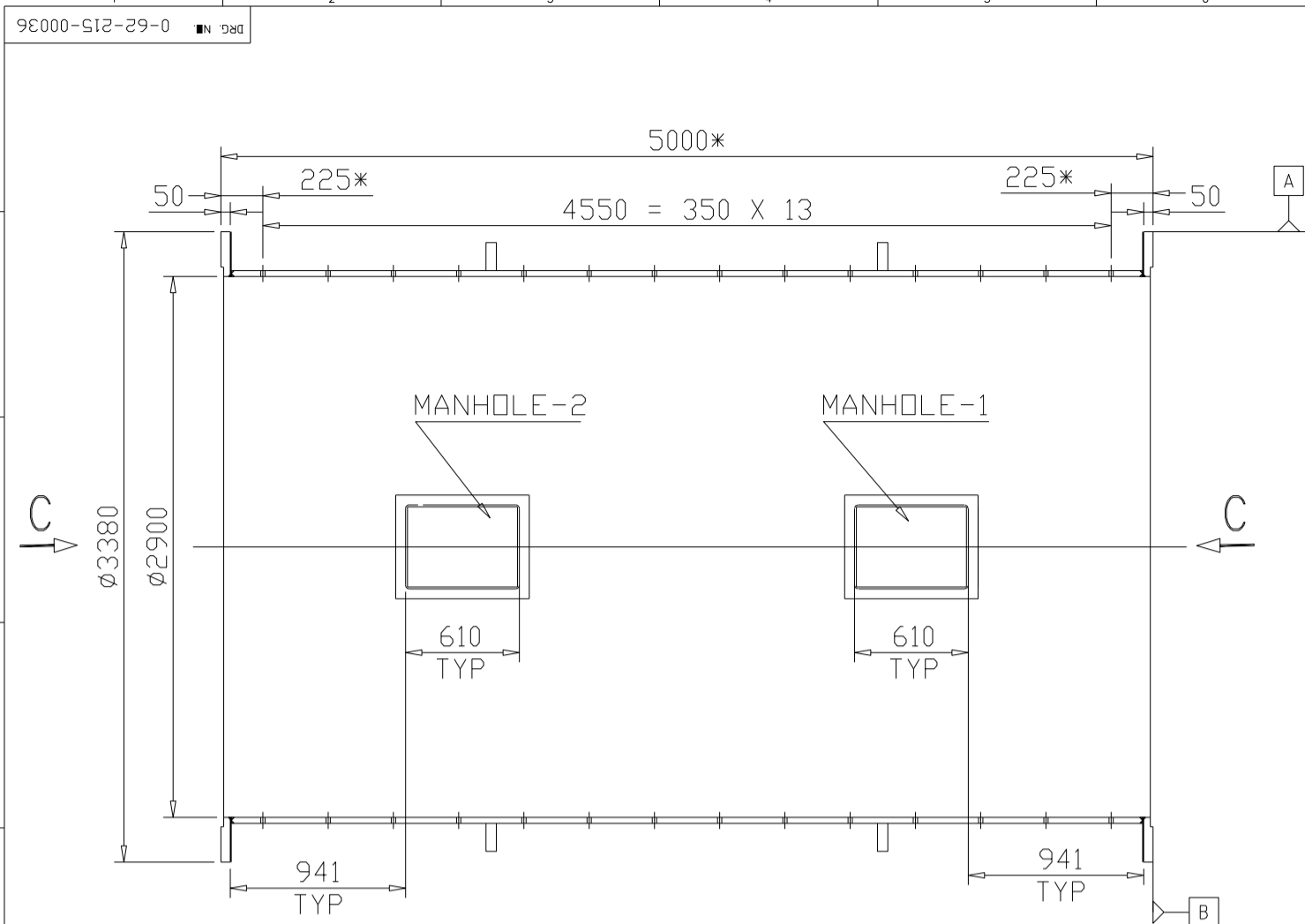


NOTES:

1. PAINT AS PER A PPROVED PAINTING STANDARD FOR THE PROJECT.
2. FINAL DIMENSIONS TD BE MAINTAINED AS PER SECTION A-A, DETAILS B S. C.
3. CRITICAL DIMENSIONS INDICATED WITH *

CHEEK TRUNNION-RM		3-62-215-00035		8367	
01 LOSS		RAW MATERIAL SIZE OR		01	
ITEM	DESCRIPTION	DRAWING NO.	VAR.	CASTING DRG. NO. OR FORGING DRG. NO.	MATERIAL SPECN.
NO.	NON-CASJ PARTS	NO.			
					TYPE OF PRODUCT
					WET BALL MILLS

RESTRICTED USE



- NOTES:
1. DRILL THE LINER HOLES (Ø24 MM) AND HOLES IN SHELL FLANGES (Ø 25 AND Ø39) WITH REFERENCE TO A-A AXIS. THE POSITIONING DEVIATION OF LINER HOLES MUST NOT EXCEED ±1 MM.
 2. ALL HOLES SHALL BE CHAMFERED BY 1MM AT 45° ON OUTSIDE OF SHELL.
 3. CRITICAL DIMENSIONS ARE IDENTIFIED WITH '*'.
 4. INSPECTION AS PER APPROVED QUALITY PLAN.

01	MILL SHELL FAB WITH LIFTING LUGS	3-62-215-00034			14506	01
ITEM NO	DESCRIPTION	DRAWING NO	VAR NO	RAW MATERIAL SIZE NO CASTING DRG NO OR WELDING DRG NO	MATERIAL CODE	NET WT. GROSS WT. QUANTITY

NON-CAST PARTS (FABRICATED AND NOT MACHINED)
ALL DIMENSIONS ARE IN MILLIMETERS
DIMENSIONS ARE IN MILLIMETERS
X & XX 4:5 FROM 0-500 MM
X & XX 1:3 FROM 500-2440 MM
X & XX 1:3 FROM 2440 MM

TYPE - PRODUCT: WET BALL MILLS
NAME - CUSTOMER/PROJECT: SHARAT HEAVY ELECTRICALS LIMITED HYDERABAD

DATE: 11/12/21
BY: SHARJFF
CHK: K.PAVAN
APPD: AMAN

SCALE: NTS
WEIGHT (KG): 12996

TITLE: MILL SHELL MACHINING
DRAWING NO: 0-62-215-00036
SHEET NO: 01

DRILLING LAYOUT OF Ø24 MM HOLES (280 Nos) ON SHELL, PITCH DISTANCE OF 350 MM ALONG AXIS AND 18° ALONG CIRCUMFERENCE

REV	DATE	ALTERED	CHECKED	APPROVED	REV	DATE	ALTERED	CHECKED	APPROVED	REV	DATE	ALTERED	CHECKED	APPROVED	REV	DATE	ALTERED	CHECKED	APPROVED	REV	DATE	ALTERED	CHECKED	APPROVED	REV	DATE	ALTERED	CHECKED	APPROVED	REV	DATE	ALTERED	CHECKED	APPROVED	REV	DATE	ALTERED	CHECKED	APPROVED
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