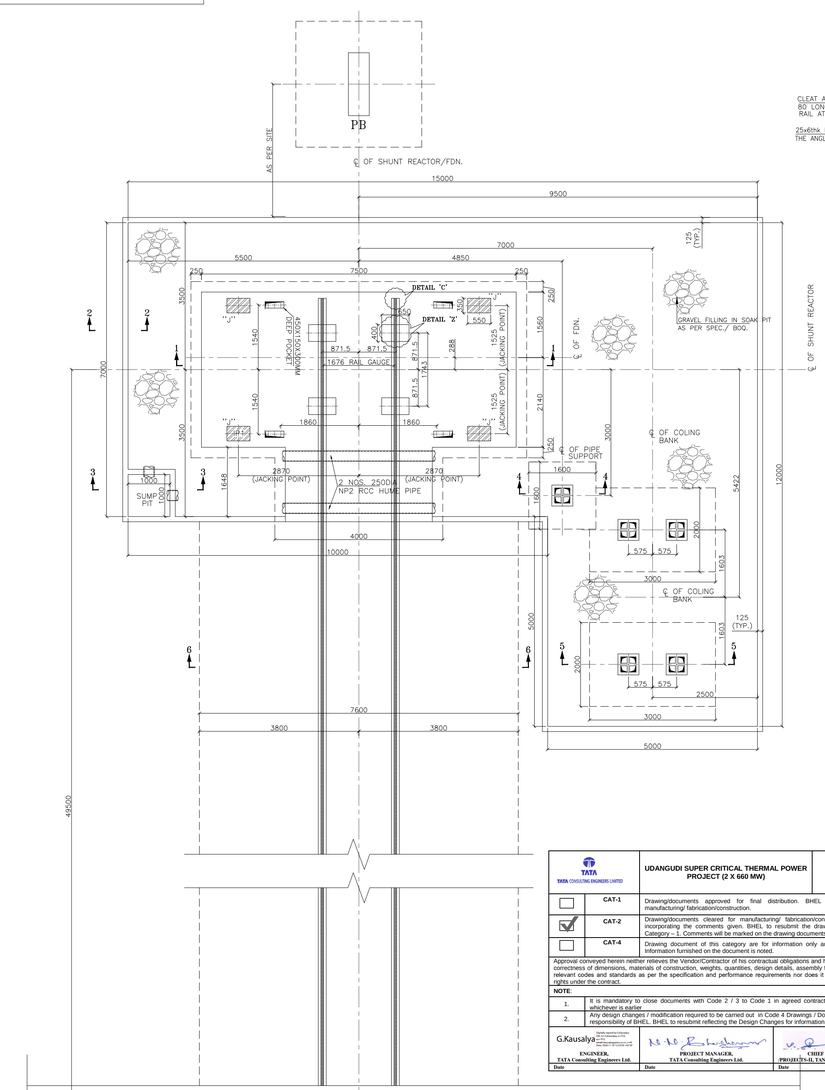
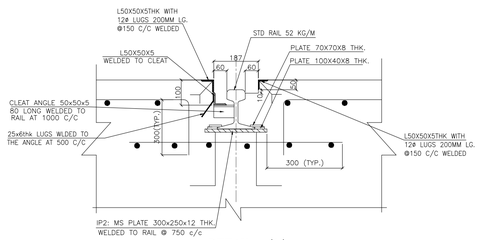
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

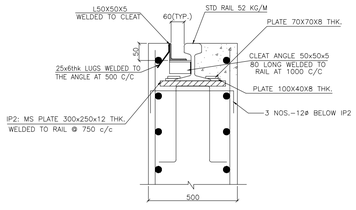
DRAWING No. TB-1-400-607-607



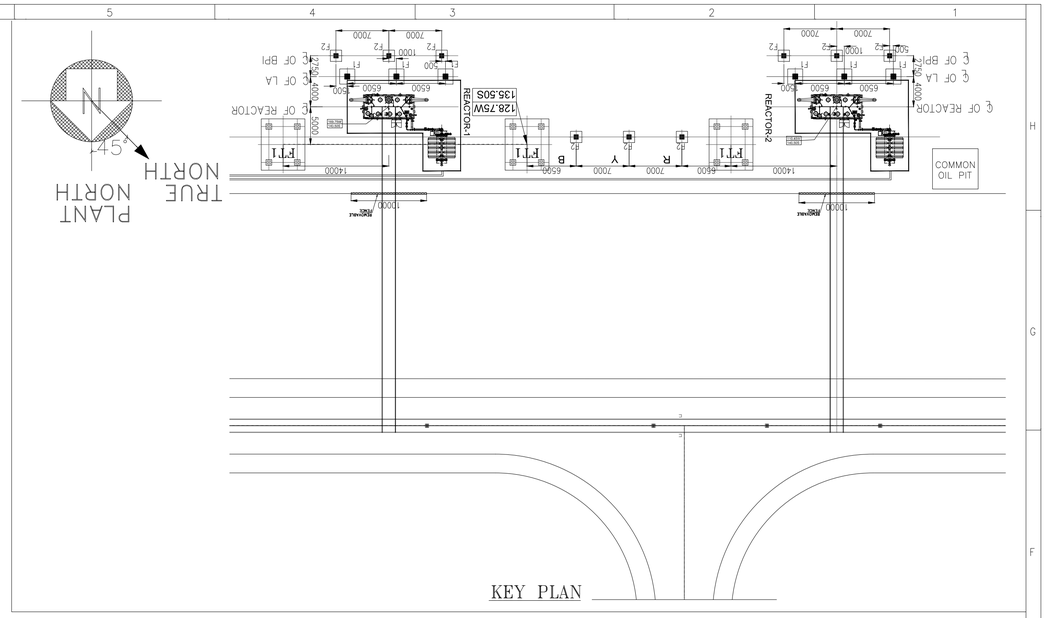
PLAN FOR 125MAVR REACTOR FDN. & RAIL-CUM-ROAD AND PULL BLOCK



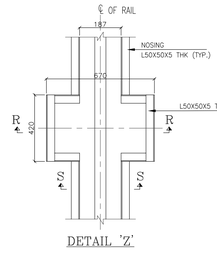
DETAIL –'X'
(SECTION S-S)



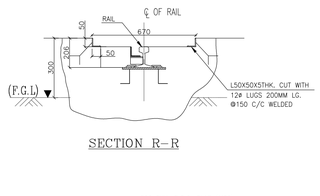
DETAIL –'Y'
(RAIL WALL)



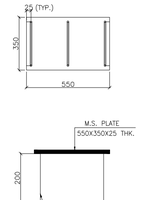
KEY PLAN



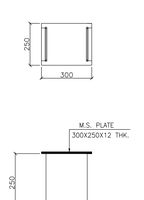
DETAIL 'Z'



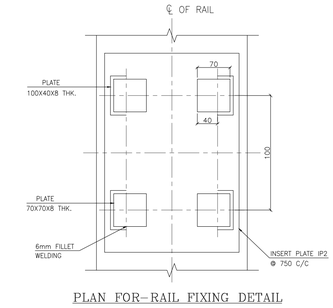
SECTION R-R



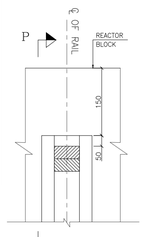
DET. OF 'IP1'
(FOR JACKING PAD)



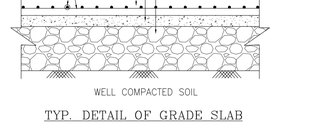
DET. OF 'IP2'



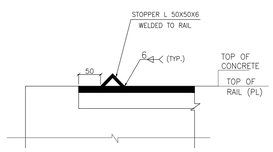
PLAN FOR-RAIL FIXING DETAIL



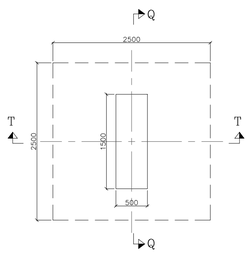
DETAIL "C"
(STOPPER DETAIL)



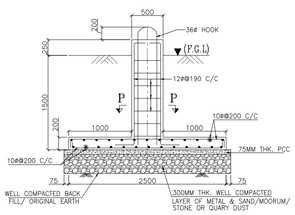
TYP. DETAIL OF GRADE SLAB



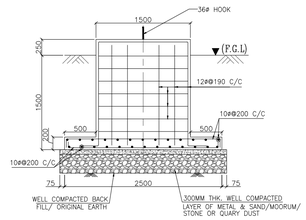
VIEW P-P



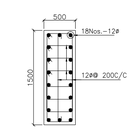
PLAN PULLING BLOCK



SECTION T-T



SECTION Q-Q



SECTION P-P

NOTES:-

1. ALL DIMENSIONS ARE IN MM & ELEVATIONS ARE IN METER UNLESS NOTED OTHERWISE.
2. ALL STRUCTURAL CONC. SHALL BE DESIGN MIX M30.
3. ALL LEAN CONC. SHALL BE 75MM THK. AND OF GRADE M7.5 UNLESS NOTED OTHERWISE.
4. ALL REINFORCEMENT STEEL BARS (HCRM)(DENOTED AS Ⓣ) SHALL BE OF GRADE Fe500D CONFORMING TO IS:1786 (LATEST REVISION).
5. UNLESS NOTED OTHERWISE LAP/ANCHOR LENGTH SHALL BE 50 TIMES THE DIA. OF BARS.
6. CLEAR COVER TO MAIN REINFORCEMENT STEEL BARS SHALL BE AS FOLLOWS:-

ITEMS	TOP	BOTTOM	SIDE
a) FOUNDATIONS	50MM.	50MM.	50MM.
b) COLUMNS	50MM.	–	50MM.

7. FOR LOCATION OF THE FOOTING, REFER TO ELEC. LAYOUT DWG NO. TB-0-400-316-002, FDN. LAYOUT DWG NO. TB-0-400-607-601.
8. FOR DETAILS AND ARRANGEMENT OF FOUNDATION BOLTS, REFER. EQPT. OGA DWG. NO. 3-469-000-2034.
9. SUPPLY OF BOLTS IS IN THE SCOPE OF BHEL BHOPAL HOWEVER SUPPLY OF EMBEDDED STEEL PLATES FOR J-PADS IS IN BHEL TBC SCOPE.
10. THE GROUTING SHALL BE NON-SHRINK FLOWABLE TYPE M30 AS PER SPECIFICATION.
11. BACK FILLING OF FOUNDATION, SHALL BE DONE IN LAYERS, WATERED AND PROPERLY COMPACTED.
12. BOTTOM 300MM OF EXCAVATION TO BE DONE CAREFULLY TO AVOID OVER EXCAVATION.
13. IF LOOSE STRATA FOUND AT FOUNDING LEVEL, THE SAME SHALL BE REPLACED WITH PCC (1:3:6).
14. ORIENTATION OF FOOTING SHALL BE CHECKED WITH ELECTRICAL LAYOUT DRAWING BEFORE STARTING EXCAVATION.
15. A LAYER OF SCREED CONCRETE (1:2:4) SHALL BE LAID OVER GRADE SLAB WITH SLOPE OF 1:500 OR AS PER SITE SUITABILITY IN SUCH A WAY THAT OIL SHALL FLOW TOWARDS SUMP-PIT.
16. THIS DRAWING SHALL BE READ IN CONJUNCTION OF THE DWG. NO. 3-469-000-2032 (04 SHEETS) R2, 3-469-000-2033 Sh-1/1 R2, 3-469-000-2034 Sh-1/1 R1 AND TB-4-400-316-018 R1.
17. # LOCATIONS OF PULL BLOCK FDNS ARE TENTATIVE AND CAN BE SHIFTED TOWARDS TO OR FAR AWAY FROM MAIN BLOCK DEPENDING ON SPACE CONSTRAINT AND SITE SUITABILITY.
18. GRAVEL FILLING,40 MM SIZE IN SOAK PIT SHALL BE DONE UPTO FGL.
19. FOUNDING LEVEL SHALL BE MINIMUM 6.0 METER AND MAXIMUM 7.5 METER FROM F.G.L. (AS PER GEO TECH REPORT).

TATA CONSULTING ENGINEERS (I) LIMITED

UDANGUDI SUPER CRITICAL THERMAL POWER PROJECT (2 X 660 MW)

☐	CAT-1	Drawing/documents approved for final distribution. BHEL will proceed with manufacturing/ fabrication/construction.
☑	CAT-2	Drawing/documents cleared for manufacturing/ fabrication/construction subject to incorporating the comments given. BHEL to resubmit the drawing for Approval in Category – 1. Comments will be marked on the drawing documents.
☐	CAT-4	Drawing document of this category are for information only and not for approval. Information furnished on the document is noted.

Approval conveyed herein neither relieves the Vendor/Contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits conforming to the relevant codes and standards as per the specification and performance requirements nor does it limit the purchaser's rights under the contract.

NOTE:

1. It is mandatory to close documents with Code 2 / 3 to Code 1 in agreed contract period or 2 weeks, whichever is earlier.
2. Any design changes / modification required to be carried out in Code 4 Drawings / Documents shall be the responsibility of BHEL. BHEL to resubmit reflecting the Design Changes for information.

ENGINEER, TATA Consulting Engineers Ltd.	PROJECT MANAGER, TATA Consulting Engineers Ltd.	CHIEF ENGINEER PROJECTS-II, TANGEDCO, CHENNAI-02
Date	Date	Date

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD
																									02	29.10.20	MOHIT	AKM	PLK
																									01	09.10.20	PNK	AKM	PLK

REVISED AS PER CUSTOMER COMMENTS.

REVISED AS PER CUSTOMER COMMENTS.

PROJECT	2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-I
CUSTOMER	TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)
CONSULTANT	TATA CONSULTING ENGINEERS LIMITED BENGALURU
	BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP NOIDA

JOB NO.

STATUS CONTRACT

DISTRIBUTION

DEPT CODE		NAME	SIGN	
E	DRN	MOHIT	–SD–	22.07.20
	DESN	PNK	–SD–	22.07.20
	CHD	AKM	–SD–	22.07.20
	APPD	PLK	–SD–	22.07.20

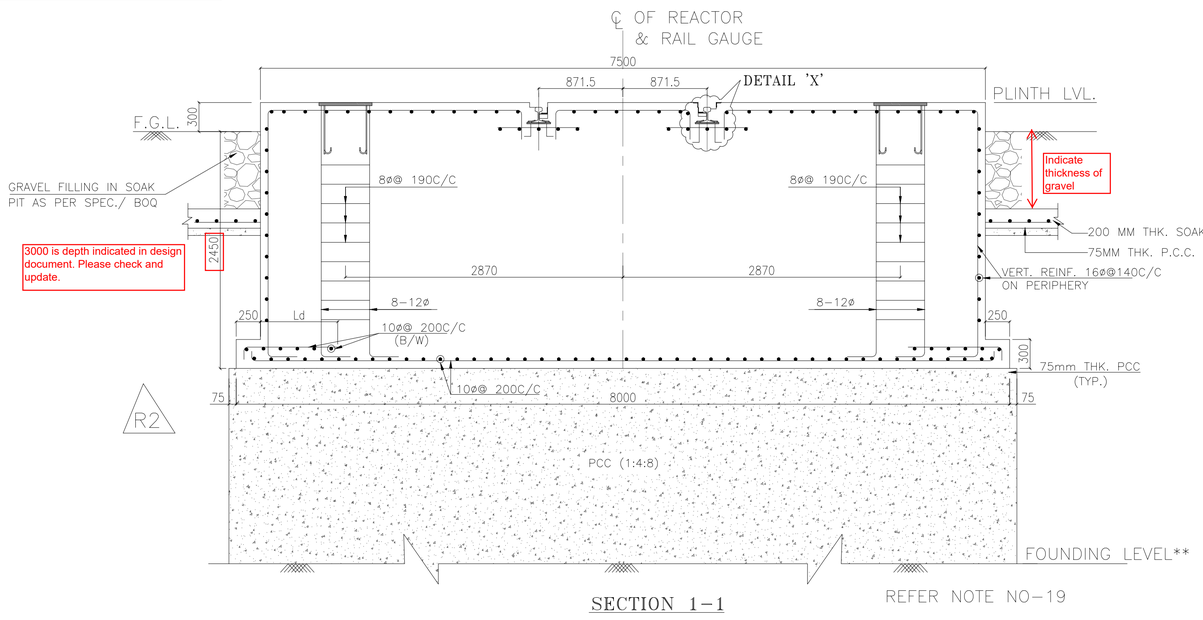
TITLE

R.C.C. DETAILS OF 125MVAR REACTOR FOUNDATION

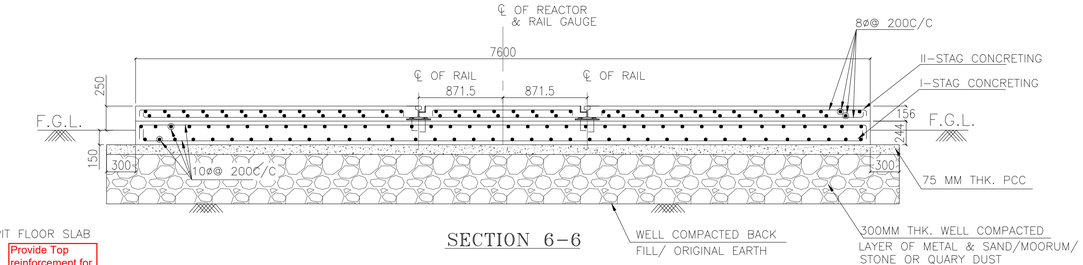
DEPT. | SCALE 1:300 | SIGN

DRAWING NO. TB-1-400-607-607

SHEET 01 OF 02 | REV. 02



SECTION 1-1



SECTION 6-6

TATA CONSULTING ENGINEERS LIMITED	**UDANGUDI SUPER CRITICAL THERMAL POWER PROJECT (2 X 660 MW)**	TANGEDCO
☐	**CAT-1**	Drawing/documents approved for final distribution. BHEL will proceed with manufacturing/ fabrication/construction.
☑	**CAT-2**	Drawing/documents cleared for manufacturing/ fabrication/construction subject to incorporating the comments given. BHEL to resubmit the drawing for Approval in Category – 1. Comments will be marked on the drawing documents.
☐	**CAT-4**	Drawing document of this category are for information only and not for approval. Information furnished on the document is noted.

Approval conveyed herein neither relieves the Vendor/Contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits conforming to the relevant codes and standards as per the specification and performance requirements nor does it limit the purchaser's rights under the contract.

NOTE:

1. It is mandatory to close documents with Code 2 / 3 to Code 1 in agreed contract period or 2 weeks, whichever is earlier
2. Any design changes / modification required to be carried out in Code 4 Drawings / Documents shall be the responsibility of BHEL. BHEL to resubmit reflecting the Design Changes for information.

G.Kausalya		
ENGINEER, TATA Consulting Engineers Ltd.	PROJECT MANAGER, TATA Consulting Engineers Ltd.	CHIEF ENGINEER /PROJECTS-II, TANGEDCO, CHENNAI-02
Date	Date	Date

NOTES:-

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3. ALL LEAN CONC. SHALL BE 75MM THK. AND OF GRADE M7.5 UNLESS NOTED OTHERWISE.
4. ALL REINFORCEMENT STEEL BARS (HCRM)(DENOTED AS ℄) SHALL BE OF GRADE Fe500D CONFORMING TO IS:1786 (LATEST REVISION).
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8. FOR DETAILS AND ARRANGEMENT OF FOUNDATION BOLTS, REFER. EQPT. OGA DWG. NO. 3-469-000-2034.
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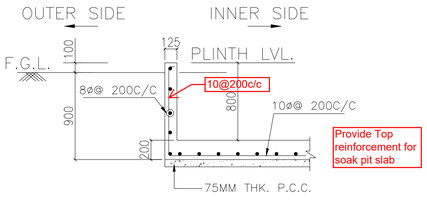
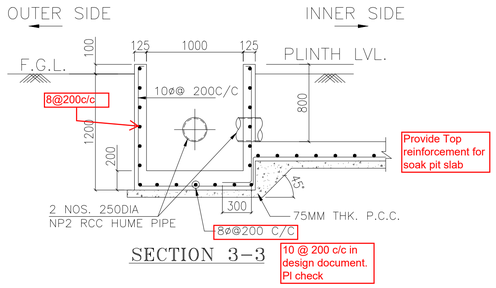
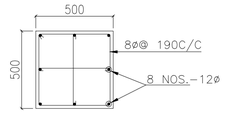


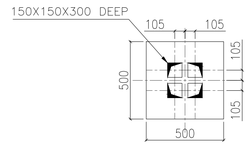
SECTION 2-2



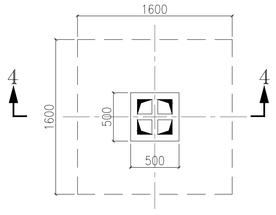
SECTION 3-3



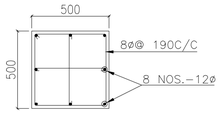
SECTION N-N



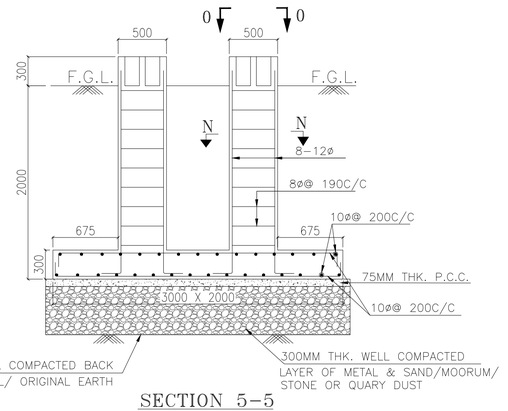
VIEW 0-0



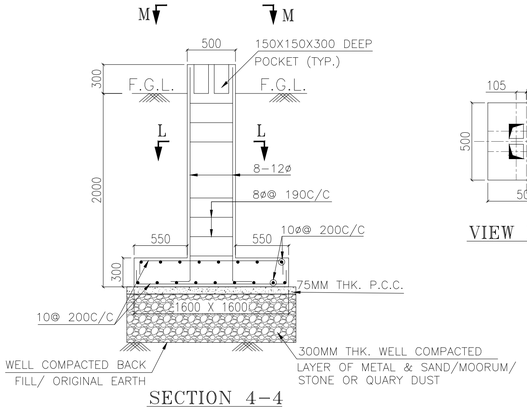
(PIPE SUPPOSE FOUNDATION PLAN)



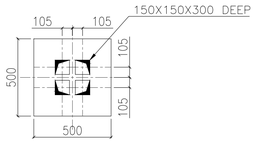
SECTION L-L



SECTION 5-5



SECTION 4-4



VIEW M-M

REV.	DATE	ALTD	CHD	APPD	REMARKS
02	29.10.20	MOHIT	AKM	PLK	REVISED AS PER CUSTOMER COMMENTS.
01	09.10.20	PNK	AKM	PLK	REVISED AS PER CUSTOMER COMMENTS.

PROJECT	2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-I
CUSTOMER	TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)
CONSULTANT	TATA CONSULTING ENGINEERS LIMITED BENGALURU
	BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP NOIDA

JOB NO.
STATUS CONTRACT
DISTRIBUTION

DEPT CODE		NAME	SIGN	
E	DRN	MOHIT	-SD-	22.07.20
	DESN	PNK	-SD-	22.07.20
	CHD	AKM	-SD-	22.07.20
	APPD	PLK	-SD-	22.07.20

TITLE: R.C.C. DETAILS OF 125MVAR REACTOR FOUNDATION

DEPT. | SCALE 1:300 | SIGN | DRAWING NO. TB-1-400-607-607 | SHEET 02 OF 02 | REV. 02

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3 469 00 01756

REF.WO.NO. 65002-A-517-01
REF.DRG.NO. 3 469 00 01756

SIGN.DATE

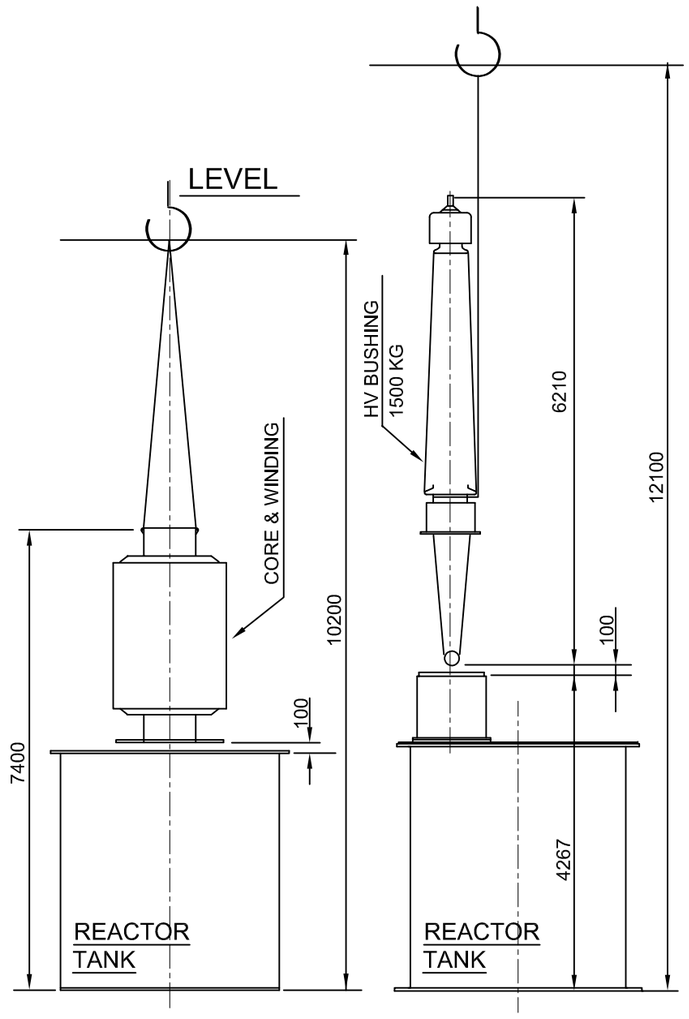
INVENTORY NO.

NOTES:-

1. WHEN REFERRING THIS DRAWING PLEASE QUOTE MVAR & W.O. NO.
2. 320 DIA. TWIN BI-DIRECTIONAL ROLLERS MOUNTED AT 1676 mm RAIL GAUGE IN BOTH DIRECTION ARE PROVIDED FOR MOVEMENT OF REACTOR AT SITE AND ROLLERS ARE TO BE REMOVED BEFORE ERECTION
3. PAINTING AT OUTSIDE THE REACTOR TANK & COOLER CONTROL CABINET IS AS PER SHADE NO. 631 OF IS:5.
4. WIRING FROM INSTRUMENT CTS. ETC. ARE NOT SHOWN FOR CLARITY.
5. FOUNDATION BOLTS ARE IN THE SCOPE OF BHEL SUPPLY.
6. FOR PART LIST OF OGA REFER DRAWING NO. 3 469 00 02033.
7. DIMNS. SHOWN THUS ▭ ARE OVERALL SHIPPING DIMENSIONS EXCLUSIVE OF PACKING.
8. DIMENSIONS SHOWN ARE WITH REF.TO PLINTH LEVEL. PLEASE NOTE THAT PLINTH LEVEL IS 450 MM ABOVE THE GROUND LEVEL.
9. FOR TANK COVER BOLTED REFER DETAIL 'B' SHT. NO. 03.

IMPORTANT NOTE :-

1. THE DESIGN FEATURES SHOWN ON THIS DRAWING (GENERALLY INLINE WITH IEC : 60076-6 APPLICABLE STANDARD & AGREED CUSTOMER SPECIFICATION) MEETS THE STATUTORY, REGULATORY & SAFETY REQUIREMENTS WITH RESPECT TO EARTHING ARRANGEMENT, DANGER & OTHER LABELS, CLEARANCES IN AIR PROVISION FOR PRESSURE RELIEF DEVICE, GAS ACTUATED RELAY AND ANTI-EARTHQUAKE CLAMPING ARRANGEMENT.



UN-TANKING

UN-TANKING OF H.V. BUSHING

MIN. AIR CLEARANCES (IN MM)		
	420 KV	145 KV
PHASE TO PHASE	4000	NA
PHASE TO EARTH	3500	1050

TABLE

SUB ASSY. MK NOS.																								
SUB ASSY	MK-01	MK-02	MK-03	MK-04	MK-05	MK-06	MK-07	MK-08	MK-09	MK-10	MK-11	MK-12	MK-13	MK-14	MK-15	MK-16	MK-17	MK-18	MK-19	MK-20	MK-21	MK-22	MK-23	MK-24	MK-25
QTY.	002	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	002	001	001	001

REFER REMARKS SHEET ATTACHED ALONG WITH THIS DOCUMENT FOR COMMENTS

REV	DATE	ALT.																			
		CKD.					CKD.			02	04.10.19	CKD.	KD/AJ		01	30.07.19	CKD.	KD/AJ		-SD-
		APPD.					APPD.					APPD.	KD/AJ				APPD.	KD/AJ		-SD-
ZONE					ZONE					ZONE	COMMENTS INCORPORATED AS PER LETTER NO.11403A-EL-VDT-186 DTD.07/08/19 .				ZONE	DESIGN BASIS AND SIZING (RATING) OF SHUNT REACTOR ALREADY SPECIFIED IN TECHNICAL SPECIFICATION. ENCLOSED HEREWITH.				

BHEL DRAWING/DOCUMENT NO	BP-DG-435-305-0001	TYPE OF PRODUCT	2 X 125 MVAR, 420KV, 3-PHASE, ONAN, SHUNT REACTOR.
ADDITIONAL INFORMATION	WO: 67023-A-517-01	PROJECT	2X660MW TANGEDCO UDANGUDI THERMAL POWER PROJECT STAGE-I.
	STATUS OF DRAWING "PR"	OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD
	DISTRIBUTION OF PRINTS	OWNER'S CONSULTANT	TATA CONSULTING ENGINEERS LIMITED, BENGALURU
	TRE-1, TRM-3	भारत हेवी इलेक्टिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL	
PO. NO.	CE/PROJ.II/SE/C/UTPP/EE/E/LOI/D.179/2017 DTD 07.12.2017.	DEPT: TRE; CODE: 406; WEIGHT(kg): -----; SCALE: COMP.SCALE-1:1	
		TITLE/-	OUTLINE GENERAL ARRANGEMENT

	NAME	SIGN	DATE
DRN.	MKP		07.01.2019
CHD.	KD/AJ		07.01.2019
APPD.	KD/AJ		07.01.2019

DRG. NO. 3 469 00 02032 REV. 02

SHEET 01 OF 04

FIRST ANGLE PROJECTION

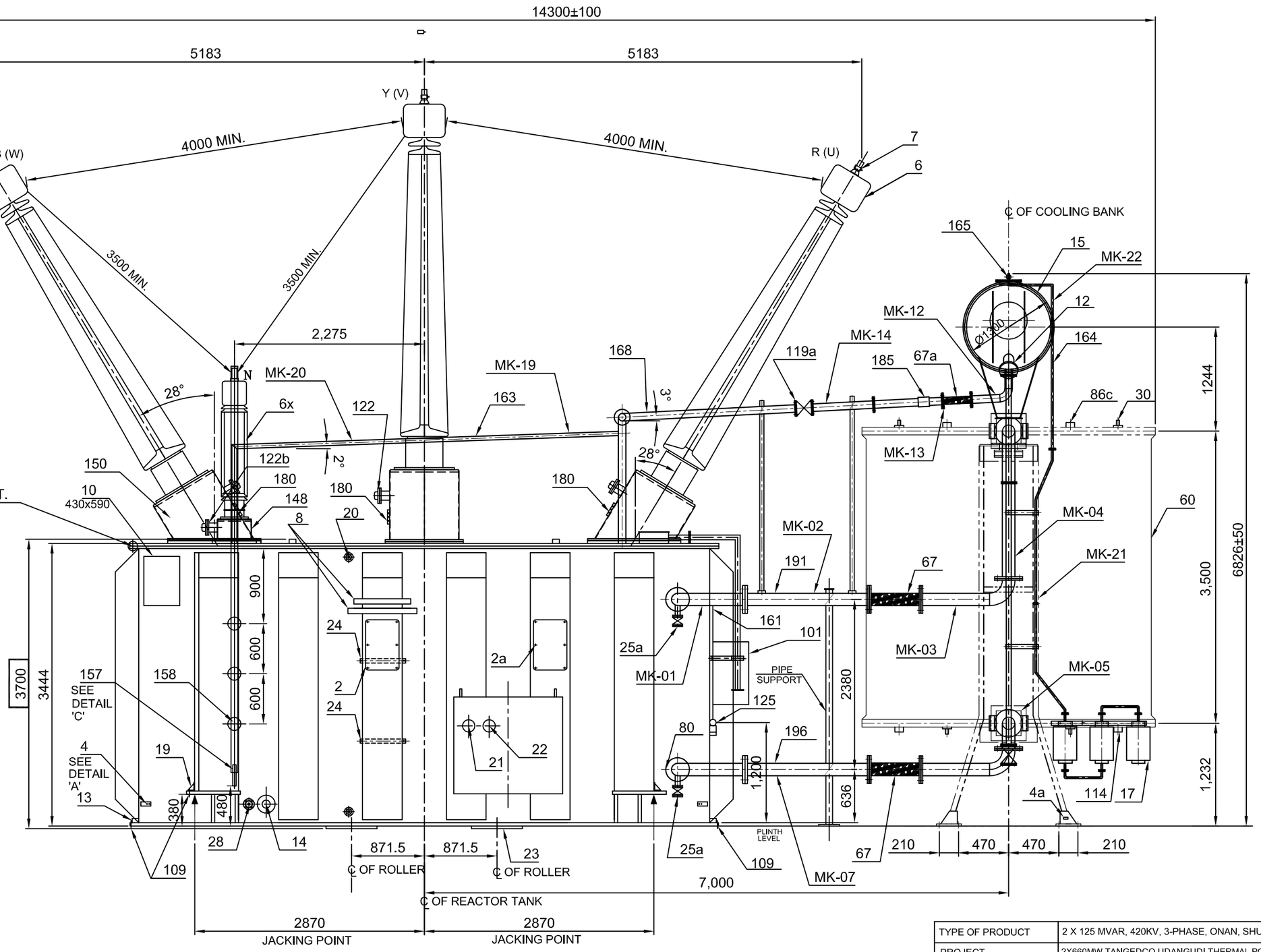
(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3 469 00 01756

REF.WO.NO. 65002-A-517-01
REF.DRG.NO. 3 469 00 01756

SIGN.DATE

INVENTORY NO.



REV	DATE	ALT.				REV	DATE	ALT.				REV	DATE	ALT.	MKP		REV	DATE	ALT.	MKP	-SD-
		CKD.						CKD.				02	04.10.19	CKD.	KD/AJ		01	30.07.19	CKD.	KD/AJ	-SD-
		APPD.						APPD.						APPD.	KD/AJ				APPD.	KD/AJ	-SD-
ZONE						ZONE						ZONE	COMMENTS INCORPORATED AS PER LETTER NO. 11403A-EL-VDT- 186 DTD.07/08/19 .				ZONE	DESIGN BASIS AND SIZING (RATING) OF SHUNT REACTOR ALREADY SPECIFIED IN TECHNICAL SPECIFICATION. ENCLOSED HEREWITH.				

BHEL DRAWING/DOCUMENT NO	BP-DG-435-305-0001	
ADDITIONAL INFORMATION	WO: 67023-A-517-01	
	STATUS OF DRAWING "PR"	
	DISTRIBUTION OF PRINTS	
	TRE-1, TRM-3	
PO. NO.	CE/PROJ.II/SE/C/UTPP/EE/E/LOI/D.179/2017 DTD 07.12.2017.	

TYPE OF PRODUCT	2 X 125 MVAR, 420KV, 3-PHASE, ONAN, SHUNT REACTOR.				
PROJECT	2X660MW TANGEDCO UDANGUDI THERMAL POWER PROJECT STAGE-I.				
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD				
OWNER'S CONSULTANT	TATA CONSULTING ENGINEERS LIMITED, BENGALURU				
भारत हेवी इलेक्टिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL	DEPT: TRE	CODE: 406	WEIGHT(kg): -----	SCALE: COMP.SCALE-1:1	
TITLE/- OUTLINE GENERAL ARRANGEMENT (ELEVATION VIEW)					

	NAME	SIGN	DATE
DRN.	MKP		07.01.2019
CHD.	KD/AJ		07.01.2019
APPD.	KD/AJ		07.01.2019

DRG. NO. 3 469 00 02032 REV. 02

SHEET 02 OF 04

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3 469 00 01756

REF.WO.NO. 65002-A-517-01
REF.DRG.NO. 3 469 00 01756

SIGN.DATE

INVENTORY NO.

7500 (INCLUDING GAS CYL. MTG.)

5183 3488 1,130 1,130 10

B (W) Y (V) R (U)

MK-08 163a 163 25 86 MK-09 3a 42 27 MK-10 18f 18c 18e 18a 18d MK-17 18 18b MK-18 MK-11 150 79 NEU. 212 119a 10 14 122a 371 1,306 650 MAX. MK-16 26 34 MK-15 119a MK-14 2,275 1,005 1420 1420 6766 4,850 7,000

907 3485 3111 1633±20 ℄ OF REACTOR TANK 3000 2422 3610 185 67a MK-13 79a 119 3819 5422 9450±100 600 600 600 1815 3,206 ℄ OF COOLING BANK 12

℄ OF CONTROL CABNET

℄ OF REACTOR TANK

℄ OF S.R.

1525 2870 JACKING POINT

℄ OF S.R.

DIRECTION OF WITHDRAWL

TANK COVER 35 20 RIM 32 TK.

DETAIL-'B'

40 40 6 BRAZED JOINT COPPER STRIP 2 x Ø14 197 147 100 45 20 100 20 75 20

DETAIL-C
NEUTRAL GROUNDING ARRGT

90 45 22.5 50 75 22 MAX. M12 20

DETAIL - A
EARTHING ARRGT
(DETAIL OF IT. 4)
SUITABLE FOR 12 X 75 FLAT

REV	DATE	ALT.				REV	DATE	ALT.				REV	DATE	ALT.	MKP			REV	DATE	ALT.			
		CKD.						CKD.				02	04.10.19	CKD.	KD/AJ			01	30.07.19	CKD.	KD/AJ		-SD-
		APPD.						APPD.						APPD.	KD/AJ					APPD.	KD/AJ		-SD-
ZONE						ZONE						ZONE	COMMENTS INCORPORATED AS PER LETTER NO.11403A-EL-VDT-186 DTD.07/08/19 .					ZONE	DESIGN BASIS AND SIZING (RATING) OF SHUNT REACTOR ALREADY SPECIFIED IN TECHNICAL SPECIFICATION. ENCLOSED HEREWITH.					

BHEL DRAWING/DOCUMENT NO	BP-DG-435-305-0001
ADDITIONAL INFORMATION	WO: 67023-A-517-01
	STATUS OF DRAWING "PR"
	DISTRIBUTION OF PRINTS
	TRE-1, TRM-3
PO. NO.	CE/PROJ.II/SE/C/UTPP/EE/E/LOI/D.179/2017 DTD 07.12.2017.

TYPE OF PRODUCT	2 X 125 MVAR, 420KV, 3-PHASE, ONAN, SHUNT REACTOR.
PROJECT	2X660MW TANGEDCO UDANGUDI THERMAL POWER PROJECT STAGE-I.
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD
OWNER'S CONSULTANT	TATA CONSULTING ENGINEERS LIMITED, BENGALURU

भारत हेवी इलेक्टिकल्स लिमिटेड भोपाल
BHARAT HEAVY ELECTRICALS LTD. BHOPAL

DEPT	CODE	WEIGHT(kg)	SCALE
TRE	406	-----	COMP.SCALE-1:1

TITLE/- OUTLINE GENERAL ARRANGEMENT (PLAN VIEW)

	NAME	SIGN	DATE
DRN.	MKP		07.01.2019
CHD.	KD/AJ		07.01.2019
APPD.	KD/AJ		07.01.2019

DRG. NO 3 469 00 02032 REV. 02

SHEET 03 OF 04

FIRST ANGLE PROJECTION

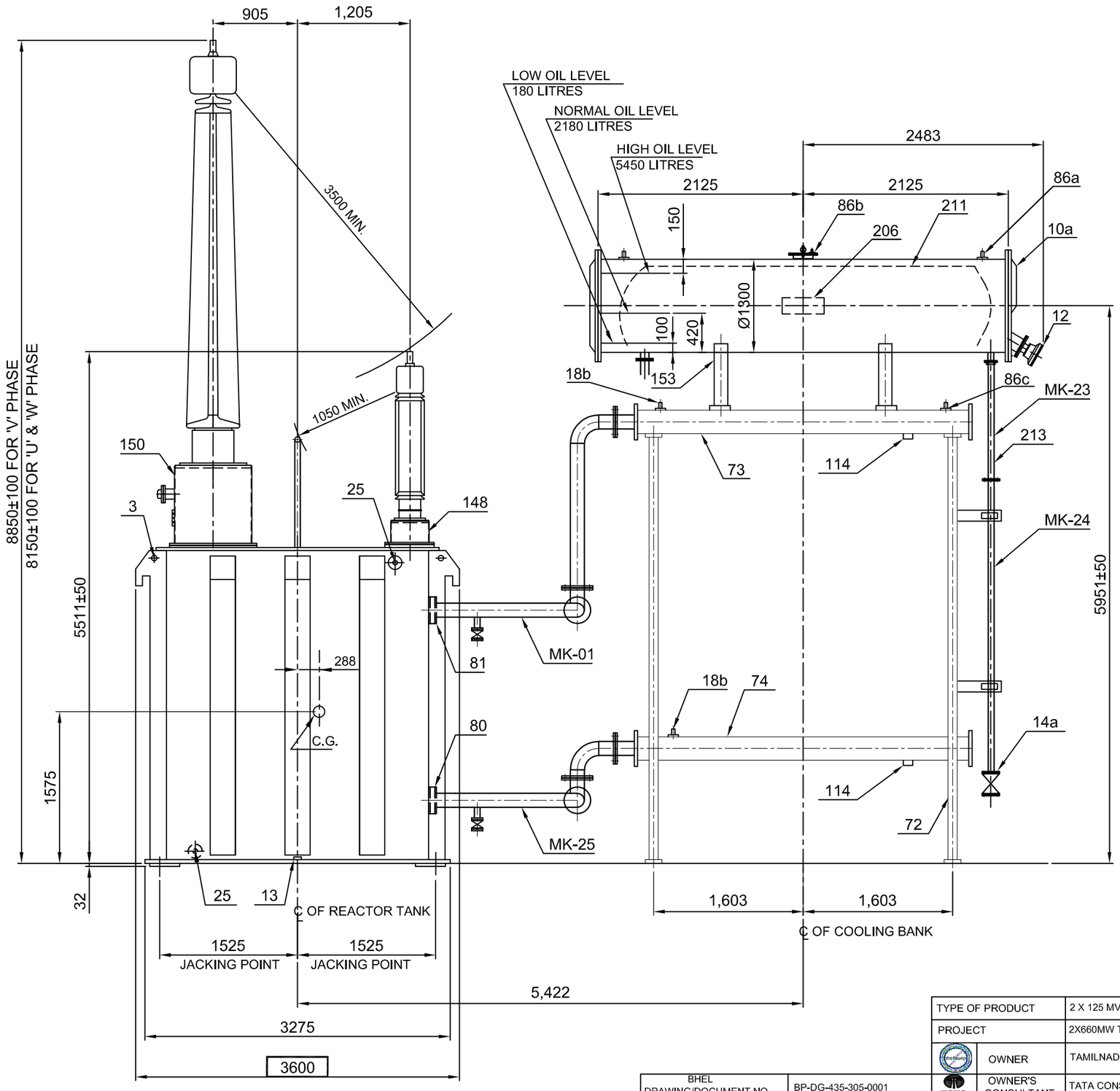
(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3 469 00 01756

REF.WO.NO. 65002-A-517-01
REF.DRG.NO. 3 469 00 01756

SIGN.DATE

INVENTORY NO.



REV	DATE	ALT.				REV	DATE	ALT.				REV	DATE	ALT.	MKP		REV	DATE	ALT.	MKP	-SD-
		CKD.						CKD.				02	04.10.19	CKD.	KD/AJ		01	30.07.19	CKD.	KD/AJ	-SD-
		APPD.						APPD.						APPD.	KD/AJ				APPD.	KD/AJ	-SD-
ZONE						ZONE						ZONE	COMMENTS INCORPORATED AS PER LETTER NO. 11403A-EL-VDT- 186 DTD.07/08/19 .				ZONE	DESIGN BASIS AND SIZING (RATING) OF SHUNT REACTOR ALREADY SPECIFIED IN TECHNICAL SPECIFICATION. ENCLOSED HEREWITH.				

BHEL DRAWING/DOCUMENT NO	BP-DG-435-305-0001	
ADDITIONAL INFORMATION	WO: 67023-A-517-01	
	STATUS OF DRAWING "PR"	
	DISTRIBUTION OF PRINTS	TRE-1, TRM-3
PO. NO.	CE/PROJ.II/SE/C/UTPP/EE/E/LOI/D.179/2017 DTD 07.12.2017.	

TYPE OF PRODUCT	2 X 125 MVAR, 420KV, 3-PHASE, ONAN, SHUNT REACTOR.
PROJECT	2X660MW TANGEDCO UDANGUDI THERMAL POWER PROJECT STAGE-I.
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD
OWNER'S CONSULTANT	TATA CONSULTING ENGINEERS LIMITED, BENGALURU

भारत हेवी इलेक्टिकल्स लिमिटेड भोपाल
BHARAT HEAVY ELECTRICALS LTD. BHOPAL

DEPT	CODE	WEIGHT(kg)	SCALE
TRE	406	-----	COMP.SCALE-1:1

TITLE/- OUTLINE GENERAL ARRANGEMENT (END VIEW)

	NAME	SIGN	DATE
DRN.	MKP		07.01.2019
CHD.	KD/AJ		07.01.2019
APPD.	KD/AJ		07.01.2019

DRG. NO 3 469 00 02032 REV. 02

SHEET 04 OF 04

401 402 403 404 405 406 407 408

A B C D E F

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3 469 00 02033

REF.WO.NO. 65002-A-517-01
REF.DRG.NO. 3 469 00 01757

SIGN.DATE

INVENTORY NO.

LIST OF DRAWING

DESCRIPTION	DRAWING NOS	
OUTLINE GENERAL ARRANGEMENT(OGA)	BP-DG-435-305-0001	3 469 00 02032
OGA PART LIST	BP-DG-435-305-0002	3 469 00 02033
FOUNDATION PLAN	BP-DG-435-305-0003	3 469 00 02034
SHIPPING DIAGRAM	BP-DG-435-305-0006	3 469 00 02035
420KV, HV LINE BUSHING	BP-DG-435-305-0004	3 469 00 02036
145KV, NEUTRAL BUSHING	BP-DG-435-305-0005	3 469 00 02037
320DIA TWIN BI-DIRECTIONAL ROLLER	BP-DG-435-305-0007	3 469 00 02038
RATING AND DIAGRAM PLATE	BP-DG-435-305-0008	3 469 00 02039

APPROXIMATE WEIGHT & OIL QTY.

DESCRIPTION	WT. IN KG	OIL (L)
CORE AND WINDING	91700	
TANK & FITTINGS	23705	47040
BUSHINGS	4700	
RADIATOR BANK & DRG.	16020	7410
CONTROL CABNET	500	
TOTAL OIL	47375	54450
TOTAL WEIGHT	184000	

TATA CONSULTING ENGINEERS LIMITED
VENDOR DRAWING STATUS

	CATEGORY	DESCRIPTION
☐	CAT-1	Drawing/documents approved for final distribution. BHEL will proceed with manufacturing/ fabrication/construction.
☑	CAT-2	Drawing/documents cleared for manufacturing/ fabrication/construction subject to incorporating the comments given. BHEL to resubmit the drawing for Approval in Category – 1. Comments will be marked on the drawing documents.
☐	CAT-3	Drawing document will be corrected as per comment and resubmitted by BHEL for further review/checking.
☐	CAT-4	Drawing document of this category are for information only and not for approval. Information furnished on the document is noted.

Note :

1.	It is mandatory to close documents with Code 2 & 3 to Code 1 in agreed contract period or 2 weeks, whichever is lower.
2.	Any design changes / modification required to be carried out in Code 4 Drawings / Documents shall be the responsibility of BHEL. BHEL to resubmit reflecting the Design Changes for information.

Approval conveyed herein neither relieves the Vendor/Contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits, performance requirements and conformity of supplies with the Indian Statutory Laws as may be applicable, nor does it limit the purchaser's rights under the contract.

Reviewed by .....S.S.Satish.....Date.....

TABLE OF FITTINGS

COOLING SYSTEM

ITEM NO	DESCRIPTION	QTY	ZONE
4a	EARTHING TERMINAL (20 TK X 50 X 110 LG).	2	207-B
25a	DRAIN/FILTER VALVE (50 NB GATE) FOR COOLING SYSTEM	2	205-C
30	LIFTING LUGS FOR RADIATORS	12	207-D
60	RADIATOR BANK (NO OF INDIVIDUAL UNITS = 10)	1	207-D
67	FLEXIBLE HOSE PIPE (200 NB) (TOP & BOTTOM)	2	206-C
72	"A" FRAME SUPPORTS (BEARING CAPACITY = 30 TONNES)	2	406-B
73	TOP HEADER	1	405-D
74	BOTTOM HEADER	1	405-C
86c	AIR RELEASE PLUGS (3/4"BSP) 10 NOS ON RADIATOR 2 NOS FOR TOP & BOTTOM HEADER	12	207-D
114	DRAIN PLUGS (3/4"BSP) 10 NOS ON RADIATOR 2 NOS FOR TOP & BOTTOM HEADER	12	207-B
119	ISOLATING VALVES FOR RADIATORS (80 NB BUTTERFLY)	20	307-D
161	GAS COLLECTING DEVICE PIPE (6 NB) 1 NO ON TANK COVER 2 NO ON HEADER	1	205-C
163	EQUALISING PIPE (50NB)	1	204-D
163a	EQUALISING PIPE (25NB) FOR TURRETS	4	303-E
191	TOP OIL PIPE 200 NB (RADIATOR BANK)	1	205-C
196	BOTTOM OIL PIPE 200 NB (RADIATOR BANK)	1	206-B

CONSERVATOR AND PIPE WORK

10a	INSPECTION COVER FOR OIL CONSERVATOR (BOLTED) 20 KG	1	407-E
12	OIL GAUGE MAGNETIC TYPE WITH LOLA	1	407-E
14a	50 NB DRAIN GATE VALVE FOR OIL CONSERVATOR	1	407-C
15	OIL CONSERVATOR 1300 DIA (ATMOSEAL TYPE)	1	207-E
17	DEHYDRATING BREATHER WITH SILICAGEL (3 IN SERIES)	1	207-B
26	BUCHHOLZ RELAY (80 NB)	1	304-D
67a	FLEXIBLE HOSE PIPE (80 NB)	1	206-D
79a	LADDER WITH LOCKING DEVICE	1	306-D
86a	AIR RELEASE PLUG (3/4"BSP) FOR CONSERVATOR.	2	407-E
86b	AIR RELEASE PLUG (1/4"BSP) FOR CONSERVATOR.	1	406-E
119a	ISOLATING VALVE BUTTERELY FOR BUCHHOLZ RELAY(80 NB) (1- GATE 1-BUTTER FLY)	2	206-D
125	GAS COLLECTING DEVICE	1	205-C
153	CONSERVATOR SUPPORTS	2	405-E
164	BREATHER PIPE (15 NB)	1	207-E
165	BREATHER ISOLATION GATE VALVE (15 NB)	1	206-E
168	CONSERVATOR PIPE (80 NB)	1	205-D
185	FLOW SENSITIVE CONSERVATOR ISOLATION VALVE	1	306-D
206	BHEL MONOGRAM	1	406-E
211	ATMOSEAL ARRANGEMENT (AIRCELL) (INSIDE THE CONSERVATOR)	1	406-E
213	CONSERVATOR DRAIN PIPE (50 NB)	1	407-D

TABLE OF FITTINGS

REACTOR

ITEM NO	DESCRIPTION	QTY	ZONE
2	RATING AND DIAGRAM PLATE	1	203-C
2a	DO'S & DONT'S INSTRUCTION PLATE	1	204-C
3	LIFTING LUGS (60000 KG. EACH)	4	403-D
3a	LIFTING LUGS FOR TANK COVER	6	304-E
4	EARTHING TERMINAL (SIZE 20 TK X 75 X 12 LG.) STAINLESS STEEL	4	202-B
8	NAME PLATES (ENGLISH & HINDI)	1+1	203-C
10	INSPECTION COVERS (25 Kgs EACH) (6NOS. ON TANK COVER, 1 NO. ON TANK)	7	202-D
13	DRAIN PLUGS ON TANK 1"BSP	2	202-B
14	100 NB DRAIN GATE VALVE	1	203-B
18	POCKET FOR OTI	1	304-E
18a	POCKET FOR WTI	1	305-E
18b	ORDINARY THERMOMETER WITH POCKET 1 NO ON TANK COVER 2 NO ON HEADER	2+1	304-E
18c	RTD POCKET FOR OTI	1	304-E
18d	RTD POCKET FOR WTI	1	304-E
18e	RTD POCKET FOR OTI (SPARE)	1	305-E
18f	RTD POCKET FOR WTI (SPARE)	1	304-E
19	JACKING PADS 60000 KG EACH	4	202-B
20	PROVISION FOR VALVE MTG FOR ONLINE INSULATING DRY KEEP SYSTEM	2	203-D
21	OIL TEMPERATURE INDICATOR.	1	204-B
22	WINDING TEMPERATURE INDICATOR DIAL TYPE WITH REPEATER	1	204-B
23	MOUNTING PAD FOR 320 DIA TWIN BI-DIRECTIONAL ROLLERS. ROLLERS ONLY FOR REACTOR MOVEMENT AT SITE.	4	204-B
24	MTG BRACKET FOR ONLINE INSULATING DRY KEEP SYSTEM	2	204-B
25	50 NB GATE VALVE ON TANK AND COVER (2 NOS ON TANK, 1 NO. ON COVER)	2+1	403-B
27	PRESSURE RELIEF DEVICE WITH OIL COLLECTOR ASSY.	1	305-E
28	15 NB GATE VALVE FOR OIL SAMPLING	1	203-B
34	COOLER CONTROL CABINET (TANK MOUNTED)	1	304-D
42	VALVE FOR CONNECTION TO VACUUM PUMP(100 NB BUTTERFLY)	1	305-E
79	LADDER WITH LOCKING DEVICE	1	302-E
80	BUTTERFLY VALVE (200 NB) AT INLET.	1	205-B
81	BUTTERFLY VALVE (200 NB) AT OUTLET.	1	404-C
86	AIR RELEASE PLUG 1/2"BSP.	1	304-E
109	PULLING HOLE DIA 64	8	202-B
212	COVER EARTHING OF CORE AND CORE CLAMPS.	1	305-E

BUSHING & TURRET

6	HV LINE BUSHINGS 420 KV 1250A	3	206-E
6X	HV NEUTRAL BUSHING 145 KV 1250A	1	203-D
7	420 KV TERMINAL CONNECTOR	3	206-E
122	CONNECTION BOX FOR C T TERMINAL (HV)	3	203-D
122a	CONNECTION BOX FOR C T TERMINAL (HVN) ON COVER	4	303-E
148	NEUTRAL TURRET	1	203-D
150	HV TURRETS	3	202-D
157	NEUTRAL GROUNDING STRIP (COPPER)	1	203-B
158	POST INSULATOR	3	203-C
180	TERMINAL MARKING PLATE	4	203-D

NOTES:-

1. EACH VALVES SHALL BE PROVIDED WITH INDICATOR TO SHOW CLEAR POSITION OF THE VALVE.
2. WEIGHTS & OIL QUANTITIES ARE FINAL.
3. CABLE TRAY ON REACTOR TANK FOR CABLING OF INSTRUMENTS.

THIS DOCUMENT WILL BE APPROVED IN CAT-1 AFTER OGA FINAL APPROVAL.

REV	DATE	ALT.																	
		CKD.					CKD.			02	04.10.19	CKD.	KD/AJ		01	30.07.19	CKD.	KD/AJ	-SD-
		APPD.					APPD.					APPD.	KD/AJ				APPD.	KD/AJ	-SD-
ZONE					ZONE					ZONE	COMMENTS INCORPORATED AS PER LETTER NO.11403A-EL-VDT-186 DTD.07/08/19			MKP	ZONE	DESIGN BASIS AND SIZING (RATING) OF SHUNT REACTOR ALREADY SPECIFIED IN TECHNICAL SPECIFICATION. ENCLOSED HEREWITH.			MKP	

BHEL DRAWING/DOCUMENT NO	BP-DG-435-305-0002
ADDITIONAL INFORMATION	WO: 67023-A-517-01
	STATUS OF DRAWING "PR"
	DISTRIBUTION OF PRINTS TRE-1, TRM-3
PO. NO.	CE/PROJ.II/SE/C/UTPP/EE/E/LOI/D.179/2017 DTD 07.12.2017.

TYPE OF PRODUCT	2 X 125 MVAR, 420KV, 3-PHASE, ONAN, SHUNT REACTOR.			
PROJECT	2X660MW TANGEDCO UDANGUDI THERMAL POWER PROJECT STAGE-I.			
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD			
OWNER'S CONSULTANT	TATA CONSULTING ENGINEERS LIMITED, BENGALURU			
भारत हेवी इलेक्टिकल्स लिमिटेड भोपाल BHARAT HEAVY ELECTRICALS LTD. BHOPAL				
DEPT	CODE	WEIGHT(kg)	SCALE	
TRE	406	-----	COMP.SCALE-1:1	

TITLE/- OUTLINE GENERAL ARRANGEMENT (PART LIST)

	NAME	SIGN	DATE
DRN.	MKP		07.01.2019
CHD.	KD/AJ		07.01.2019
APPD.	KD/AJ		07.01.2019

DRG. NO 3 469 00 02033 REV. 02

SHEET 01 OF 01

FIRST ANGLE PROJECTION

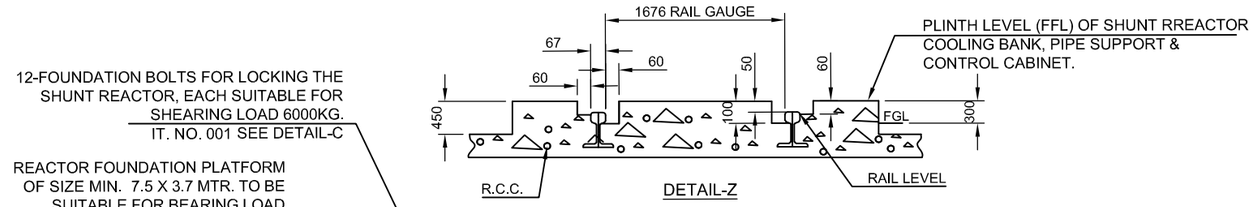
(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3 469 00 02034

REF.WO.NO. 65002-A-517-01
REF.DRG.NO. 3 469 00 01758

SIGN.DATE

INVENTORY NO.



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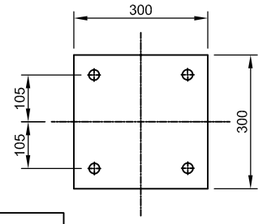
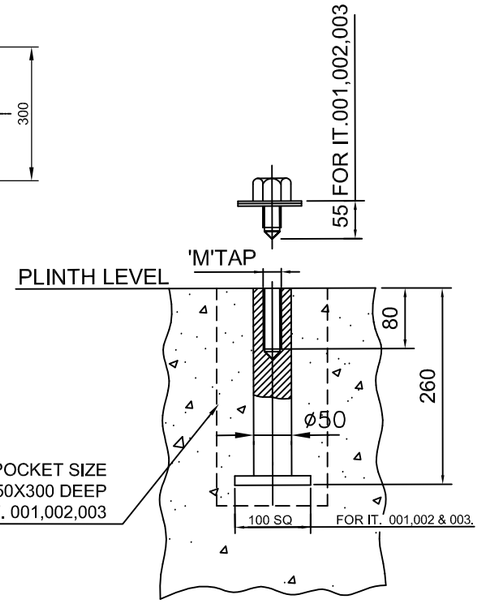
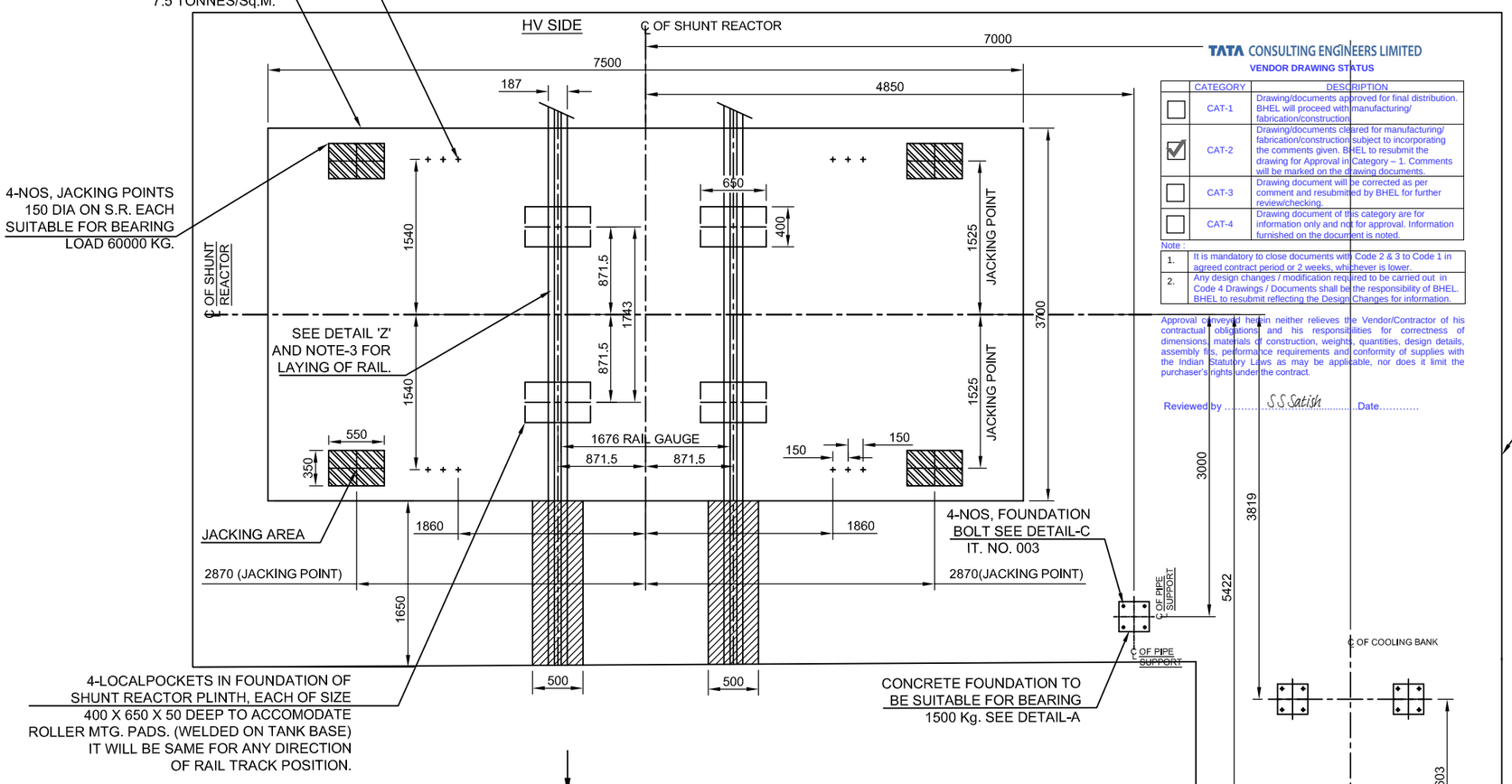


DETAIL-A



DETAIL OF FOUNDATION BOLTS DETAIL-C



REFER REMARKS SHEET FOR COMMENTS

TATA CONSULTING ENGINEERS LIMITED

VENDOR DRAWING STATUS

	CATEGORY	DESCRIPTION
☐	CAT-1	Drawing/documents approved for final distribution. BHEL will proceed with manufacturing/ fabrication/construction
☑	CAT-2	Drawing/documents cleared for manufacturing/ fabrication/construction subject to incorporating the comments given. BHEL to resubmit the drawing for Approval in Category – 1. Comments will be marked on the drawing documents.
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Note :

1.	It is mandatory to close documents with Code 2 & 3 to Code 1 in agreed contract period or 2 weeks, whichever is lower.
2.	Any design changes / modification required to be carried out in Code 4 Drawings / Documents shall be the responsibility of BHEL. BHEL to resubmit reflecting the Design Changes for information.

Approval conveyed herein neither relieves the Vendor/Contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits, performance requirements and conformity of supplies with the Indian Statutory Laws as may be applicable, nor does it limit the purchaser's rights under the contract.

Reviewed by ..... S S Satish ..... Date.....

TABLE FOR FOUNDATION BOLT

IT. NO.	DESCRIPTION	BOLT SIZE M TAP	HOLE SIZE IN PAD (Ø)	QTY. (PAD)	QTY. OF HOLE FOR PAD	TOTAL QTY. OF BOLTS
001	SHUNT REACTOR MTG.	M-20	24	1	12	12
002	RADIATOR SUPPORT	M-20	24	4	4	16
003	PIPE SUPPORT	M-20	24	1	4	4

NOTES:-

1. FOUNDATION BOLTS WITH HARDWARES WILL BE SUPPLIED BY BHEL.
2. FOR OUTLINE GENERAL ARRGT. REFER DRG. 3 469 00 02032.
3. POSSITION OF RAILS HAVE BEEN SHOWN IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS.
4. THE DRAWING GIVES THE SIZE AND LOCATING DIMENSIONS OF THE LOAD BEARING PADS PROVIDED WITH REACTOR AND ACCESSORIES. SUITABLE CONCRETE SLAB SIZE TO RECEIVE THESE PADS TO BE DECIDED BY CUSTOMER'S CIVIL ENGINEER.
5. POCKETS OF SUITABLE SIZE MAY BE LEFT WHILE CASTING. FOUNDATION FOR EMBEDDING FEMALE PART OF FOUNDATION BOLT (TO BE SUPPLIED BY BHEL) AT THE TIME OF FINAL.
6. PLINTH LEVEL :- LEVEL OF TOP OF CONCRETE OF ALL STRUCTURES FOUNDATION.
7. DIMENSION OF SOAK PIT WILL BE FINAL AS PER DRAWING NO. TB-400-316-018

REV	DATE																
		ALT.					ALT.					ALT.					
		CKD.					CKD.					CKD.					
		APPD.					APPD.					APPD.					
ZONE					ZONE					ZONE							

REV	DATE			
		ALT.	MKP	
01	04.10.19	CKD.	KD/AJ	
		APPD.	KD/AJ	
ZONE	COMMENTS INCORPORATED AS PER LETTER NO.11403A-EL-VDT-186 DTD.07/08/19			

BHEL DRAWING/DOCUMENT NO	BP-DG-435-305-0003
ADDITIONAL INFORMATION	WO: 67023-A-517-01
	STATUS OF DRAWING "PR"
	DISTRIBUTION OF PRINTS
	TRE-1, TRM-3
PO. NO.	CE/PROJ.II/SE/C/UTPP/EE/E/LOI/D.179/2017 DTD 07.12.2017.

TYPE OF PRODUCT	2 X 125 MVAR, 420KV, 3-PHASE, ONAN SHUNT REACTOR.
PROJECT	2X660MW TANGEDCO UDANGUDI THERMAL POWER PROJECT STAGE-I.
OWNER	TAMILNADU GENERATION & DISTRIBUTION CORPORATION LTD
OWNER'S CONSULTANT	TATA CONSULTING ENGINEERS LIMITED, BENGALURU

भारत हेवी इलेक्टिकल्स लिमिटेड भोपाल
BHARAT HEAVY ELECTRICALS LTD. BHOPAL

DEPT	CODE	WEIGHT(kg)	SCALE
TRE	406	-----	COMP.SCALE-1:1

	NAME	SIGN	DATE
DRN.	MKP		07.01.2019
CHD.	KD/AJ		07.01.2019
APPD.	KD/AJ		07.01.2019

TITLE/- FOUNDATION PLAN

DRG. NO 3 469 00 02034 REV. 01

SHEET 01 OF 01

101 102 103 104 105 106 107 108

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS ENGINEERING MANAGEMENT

DOCUMENT No.	**TB-400-316-018**	Rev. No.	**02**	Prepared	Checked	Approved
TYPE OF DOC.	**DESIGN REPORT**		SIGN			
TITLE **Design of Soak Pit & Common burnt oil pit For Shunt reactor in 400kV Switchyard area**			NAME	**SS**	**SKS**	**SKS**
			DATE	19.07.19	19.07.19	19.07.19
			GROUP	**TBEM**	W.O. No	**87005**
OWNER	**TAMILNADU GENERATION AND DISTRIBUTION CORPORATION (TANGEDCO)**					
OWNER'S CONSULTANT	**TATA CONSULTING ENGINEERS LIMITED BENGALURU**					
PROJECT	**2 x 660 MW Udangudi STPP (Stage-I)**					
SYSTEM	**ELECTRICAL**					

Rev No.	Date	Altered	Checked	Approved	Revision Details
02	20.12.19	SS	SKS	SKS	Revised as per TCE comments vide letter TCE.11403A-EL-VDT-328 dated 22.11.2019
01	23.10.19	SS	SKS	SKS	Revised as per TCE comments vide letter TCE.11403A-EL-VDT-163 dated 25.07.2019

Distribution	To	TBEM	OWNER	CONSULTANT	
	Copies	1	1	1	

1 Scope

The scope of this document cover the following:
a) Sizing of Soak Pit for 125 MVAR, 400kV Bus Reactor.
b) Sizing of common Burnt oil pit in switchyard area for 125 MVAR, 400kV Bus Reactor.

2 Design Basis

The following drawings are referred (as uploaded in PEDM):

Sl. No	Division	Systems/Area	Drawing/Document No	Rev	Title
1	BPL	Shunt Reactor	BP-DG-435-305-0001	2	Outline Gen. Arrangement
2	BPL	Shunt Reactor	BP-DG-435-305-0002	2	OGA Part List
3	BPL	Shunt Reactor	BP-DG-435-305-0003	2	Foundation Plan
4	BPL	Shunt Reactor	BP-DG-435-305-0008	2	Rating And Diagram Plate
5	TBG	Electrical	TB-0-400-316-002	2	GIS and Pothead yard Plan & Section Layout

1

3 Design Parameters Considered

3.1. Gravel filled open oil soakpit to be provided under each reactor and its cooler bank. The soakpit shall be designed for capacity of 1/3rd of the volume of the Reactor oil when filled with gravel of size 60 mm.

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3.2. A common burnt oil pit shall be provided for both the reactor in switchyard which should be located at more than 5 metres from the Reactor to drain the oil away from the soak pit. Burnt oil pit shall be sized to accommodate:

i. 110% of the volume of oil of the largest Reactor
ii. density of spray for high velocity water spray system = 10.2 lpm/m^2 of the largest reactor surface area (Ref: Vol. II, Sub-Section 2.15 Fire Protection System, Clause 3.0.0, Page 5 of 33)
iii. 10 Minutes operation of water spray system (Ref: NFPA 850).
iv. Quantity of rain water collected from all associated pits.

4 Design Calculation

The detailed calculations are shown below. Typical arrangement of Soak Pit is as per dwg no. TB-4-400-316-018 Rev. 01

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4.1. Design of Soak Pit under Reactor

S.No.	PARAMETER	DESIGNATION/ FORMULA	UNIT	VALUE
1.	Total volume of the Reactor oil	V_T	Litres	54450
2.		**V_T**	**m^3**	**54.45**
3.	volume of the Reactor oil for	V_{OS}= 1/3 * V_T	m^3	18.15

	designing soak pit			
4.	Total area Covered by soak pit as per drawing TB-4-400-316-018 Rev. 00	A_{SP}=15*7+5*5	m^2	130
5.	Area covered by foundation within soak pit	A_F= (A_{FR}+ A_{FRP}+ A_{FS})	m^2	29.85
6.	Area covered by foundation of reactor	A_{FR}= 7.5x3.7	m^2	27.75
7.	Area covered by rail pad foundation	A_{FRP}= 2x(0.5x1.65)	m^2	1.65
8.	Area covered by pipe support foundation & Cooling bank foundation	A_{FS}= 1x(0.3x0.3)+ 4x(0.3x0.3)	m^2	0.45
9.	Total Void Area within Soak pit (available area for Gravel filling)	A_T= A_{SP} - A_F	m^2	100.15
10.	Porosity	P		0.33
11.	Total Void area Available after Gravel filling	A_V=P* A_T	m^2	33.38
12.	Depth of Soak pit Calculated	= V_{OS}/ A_V	m	0.544
13.	**Depth of Soak pit considered (below FGL)**	**D**	**mm**	**600**
14.	Freeboard considered above FGL		mm	100

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4.2. Design of common Burnt oil pit in switchyard area for 125 MVAR, 400kV Bus Reactor

S.No.	PARAMETER	DESIGNATION/ FORMULA	UNIT	VALUE
1.	**Volume of Oil considered for design of Burnt oil pit**	**V_{OB}=110%* V_T**	**m^3**	**59.89**
2.	Length of Reactor Main Tank	L_R	m	7.5
3.	Height of Reactor Main Tank	H_R	m	3.7
4.	Breadth of Reactor Main Tank	B_R	m	3.6
5.	Effective Surface Area over which firefighting water will strike on Reactor Main Tank	SA_R= 2*(L_R*H_R+F_R*B_R +B_R*L_R)	m^2	109.14
6.	Length of Cooling Bank	L_C	m	3.61
7.	Height of Cooling Bank	H_C	m	3.206
8.	Breadth of Cooling Bank	B_C	m	3.5
9.	Effective Surface Area over which firefighting water will strike on Cooling Bank	SA_C= 2*(L_C*H_C+F_C*B_C +B_C*L_C)	m^2	59.18
10.	Length of oil Conservator	L_{OC}	m	4.25
11.	Diameter of oil Conservator	D_{OC}	m	1.3
12.	Effective Surface Area over which firefighting water will strike on oil Conservator	SA_{OC}	m^2	20.01
13.	Total Effective Surface Area over which fire fighting water	SA= SA_R+SA_C+ SA_{OC}	m^2	188.33

	will strike on Reactor, Cooling Bank & Oil Conservator			
14.	Rate of Flow of FF Water	R_{FF}	l/min/m^2	10.2
15.	Flow Rate of Water	FR= SA* R_{FF}	l/min	1920.97
16.	Fire Fighting Water flows for	**t**	min	10
17.	**Volume of Fire Fighting Water**	**VF=(FRx t)/1000**	**m^3**	**19.21**
18.	Twenty four (24) Hour max rainfall (as per TS Vol. II, Section 1.0, Clause 5.2.0)	=138.2/1000	m	0.1382
19.	Rate of uniform/Average rainfall for 1 hours	RR	m/Hr	0.00576
20.	Total Area covered by 2 no. reactor soak pits	=2*A_{SP}	m^2	260
21.	**Volume of rain water collected from 2 no. reactor soak pits for 1 Hour**	**VR=2*A_{SP}*RR*1**	**m^3**	**1.49**
22.	Calculated volume for Burn oil pit	**V_{BOP}** = V_{OB}+VF+VR		80.59
23.	**Proposed Length of Burn oil pit**	**L_{BOP}**	m	**8**
24.	**Proposed Breadth of Burn oil pit**	**B_{BOP}**	m	**8**
25.	**Calculated Depth of Burn oil pit**	**D= V_{BOP}/ L_{BOP}* B_{BOP}**	m	**1.259**
26.	**Freeboard for Burnt oil pit**	**FB**	m	0.150
27.	**Proposed Depth of Burn oil pit (covered) including freeboard**	**D_{BOP}=D+FB**	m	1.409 **(≈1.5)**
28.	**Design volume for Burn oil pit**	**V_D= L_{BOP}* B_{BOP}* D_{BOP}**	**m^3**	**96**

5 Annexure

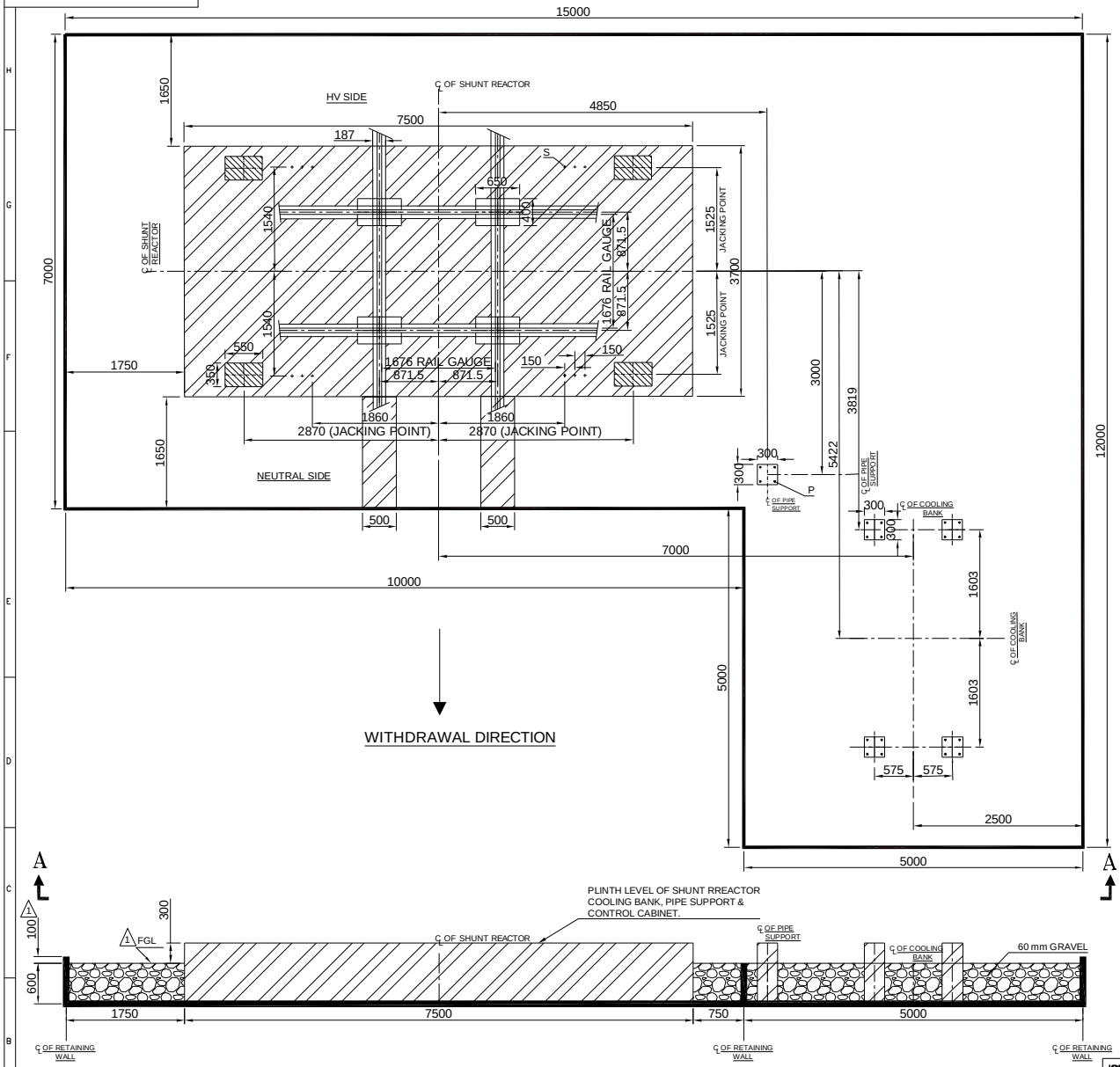
1. TB-4-400-316-018-REV 01: Layout of soak pit for 125MVAR shunt reactor

6 Conclusion

1. Depth of soak pit= 0.6m, other dimension of soakpit as per Layout of soak pit for 125MVAR shunt reactor
2. Dimension of common burnt oil pit (LxBxD) = 8m X 8m X 1.5m

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRAWING No. TB-4-400-316-018



SECTION A-A

REFERENCE DRAWINGS/DOCUMENTS:

1. BP-DG-435-305-0001 Rev. 02: Outline Gen. Arrangement-Shunt reactor 1
2. BP-DG-435-305-0003 Rev. 02: Foundation Plan-Shunt reactor 1
3. TB-400-316-018 Rev. 01: Design of Soak Pit & Common burnt oil pit For Shunt reactor in 400kV Switchyard area 1

NOTE:

1. All Dimensions are in mm.
2. Gravel filled open oil pit to be provided under each reactor and its cooler bank.
3. A common burnt oil pit to be provided for both the reactor in switchyard which should be located at more than 5 meter from the Reactor to drain the oil away from the soak pit. The size of common burnt oil pit is as per TB-400-316-018 Rev. 01. 1
4. For Location and further connection of soak pit to Burnt oil pit, refer GIS and pothead yard plan & section layout
5. This document is for layout of soak pit. Separate Civil document to be referred for Details of soak pit: TB-1-400-607-633 (to be submitted after approval of this document)

TATA CONSULTING ENGINEERS LIMITED

VENDOR DRAWING STATUS

	CATEGORY	DESCRIPTION
☐	CAT-1	Drawing/documents approved for final distribution. BHEL will proceed with manufacturing/ fabrication/construction.
☑	CAT-2	Drawing/documents cleared for manufacturing/ fabrication/construction subject to incorporating the comments given. BHEL to resubmit the drawing for Approval in Category – 1. Comments will be marked on the drawing documents.
☐	CAT-3	Drawing document will be corrected as per comment and resubmitted by BHEL for further review/checking.
☐	CAT-4	Drawing document of this category are for information only and not for approval. Information furnished on the document is noted.

Note :

1.	It is mandatory to close documents with Code 2 & 3 to Code 1 in agreed contract period or 2 weeks, whichever is lower.
2.	Any design changes / modification required to be carried out in Code 4 Drawings / Documents shall be the responsibility of BHEL. BHEL to resubmit reflecting the Design Changes for information.

Approval conveyed herein neither relieves the Vendor/Contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits, performance requirements and conformity of supplies with the Indian Statutory Laws as may be applicable, nor does it limit the purchaser's rights under the contract.

Reviewed by ..... S S Satish .....Date.....

THIS DOCUMENT WILL BE APPROVED IN CAT-2, FINAL APPROVAL WILL BE GIVEN AFTER RELEASE OF ALL CIVIL DRAWINGS AND SITE CONSTRUCTION IS COMPLETED.

REV.	DATE	ALTD	CHD	APPD
1	23.10.19	SS	SKS	SKS

Revised as marked 1

JOB NO.
STATUS CONTRACT
DISTRIBUTION

PROJECT: 2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-I
CUSTOMER: TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)
CONSULTANT: TATA CONSULTING ENGINEERS LIMITED BENGALURU

BHARAT HEAVY ELECTRICALS LTD
TRANSMISSION BUSINESS GROUP
NOIDA

DEPT CODE		NAME	SIGN	DATE
E	DRN	SS		19.07.19
	DESN	SS		19.07.19
	CHD	SKS		19.07.19
	APPD	SKS		19.07.19

TITLE: LAYOUT OF SOAK PIT FOR 125MVAR SHUNT REACTOR

DEPT. SIGN | SCALE 1:300

DRAWING NO. TB-4-400-316-018

SHEET 01 OF 01 | REV. 01

400 KV SWITCHYARD AT UDANGUDI SUPERCRITICAL TPS STAGE-I (2X660 MW)

Clarification for & RCC details of reactor foundation.

BHEL Ref. No.: CLAR/PNK/20/10/29		
BHEL DWG/DOC NO.:	**TB-1-400-607-607_R1**	**DATE OF SUBMISSION OF REVISED DOCUMENTS**
DWG/DOC NAME:	**RCC details of reactor foundation.**	**29.10.20**

SL. NO.	Comments From TCE	BHEL Clarifications.
A		
1	Drawing shall be approved after design is checked for correct values of SBC as commented in design document.	Noted.
2	Details in section R-R is not matching with details in section S-S. Please check and correct	Incorporated.
3	2 lugs of 25*6 seems to be insufficient. Pl check and provide basis for design.	3 no lugs provided in Insert plate for Jacking pad (350x550 mm) .
4	Indicate reference drawing no. for Pulling block details	There is no refrence drawing for pulling block.
5	Pipe support fdn- Size of this foundation is 1200x1200 in drawing. Pl check and correct.	Incorporated.
6	1)Provide basis or vendor drawing reference for the rail fixing detail. 2) Provide detail of insert plate IP-2	1) There is no refrence drawing for rail fixing, however it is based on our general practice for 125 MVAR reactor (BHEL supply) for diffent projects including TANGEDCO Ennore. 2) Insert plate detail for IP-2 incorporated in revised drawing.
7	Soak pit wall- 100 in equipment drawing and desgin doc. Pl check & update.	Incorporated.