Corrigendum – 3 Dated July 01, 2013 to Tender specification BHEL: PSSR: SCT 1532

Some of the bidders sought clarifications in the tender and the "clarifications issued" are furnished below for your information.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
1.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter-II Clause no. 1.2.3	Installation of valves and other miscellaneous …… …… …… … insert plugs		The following portion of the clause stands deleted: Open ends of piping valves shall be protected with wooden blanking plates securely fastened with wire or by plastic insert plugs.
2.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- V Clause no. 1.5.1	EOT crane at TG hall (180T / 40T) without operator	The crane capacity is 180 T. The turbine section is 230T. Please clarify on the facility for lifting the turbine section	The EOT crane capacity is 130T / 30T and not as given in the tender. For Unit-1: The turbine section is to be lifted with the help of lifting beam provided by BHEL and other lifting tackles provided by the bidder using two EOT cranes in tandem operation. For Unit-2: Turbine section is to be assembled at site.

<table>
<tr><th>Sl. no</th><th>Published in</th><th>Existing clause</th><th>Bidder's queries</th><th>Clarifications issued by BHEL</th></tr>
<tr><td>3.</td><td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- V
Clause no. 1.5.1</td><td>Suitable Higher capacity crane (150T & above) for erection of FST, Dearator</td><td>We presumed the Deaerator & F/W storage tank are assembled on the ground and they are lifted from the outer wall of turbine building opening area (Deaerator floor) by two cranes. After that they are pulled to the actual location. Kindly conform that</td><td>Individual sections of Deaerator / FST are to be lifted to deaerator floor and to be assembled and/ erected/ welded at deaerator floor.</td></tr>
<tr><td>4.</td><td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- V
Clause no. 1.5.12</td><td>Apart from the above mentioned tools, any other tools and plants including suitable Jacks / Hydraulics jacks required for satisfactory completion of the work has to be arranged by the contractor.</td><td>Whether BHEL will provide Suitable gang jacks for Stator Alignment.</td><td>Hydraulic jacks are supplied by manufacturing units for alignment of Generator Stator. The same shall be made available to TG contractor.</td></tr>
<tr><td>5.</td><td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- VI
Clause no. 1.6.3.2</td><td><table><tr><th>Sl. No</th><th>Mile stone</th><th>Milestone month</th></tr><tr><td>01</td><td>Commencement of Condenser erection</td><td>Expected start of work - June 2013 (1st month)</td></tr></table></td><td>Expected start of work is mentioned as June 2013. Please amend the time schedule.</td><td>June 2013 is changed to July 2013.</td></tr>
</table>

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
6.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- VII Clause no. 1.7.1.2 and 1.7.1.3	1.7.1.2 Placement, alignment, …….. …….. and spring elements placement & grouting. 1.7.1.3 Assembly and positioning …… …….. hinge assy	Bidder requested that clause 1.7.1.2 and 1.7.1.3 has to be clubbed and percentage to be fixed.	Clause 1.7.1.2 altered as below: Placement, alignment, …….. …… and spring elements / supports placement & grouting. In case difficulty arises in operating the said clauses the clause 1.7.10 may be operated.
7.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- VII Clause no. 1.7.3.8	Installation of enclosures of generator / exciter with all auxiliaries- 5%	Confirm whether Enclosures for Generator / Exciter are included in the scope.	Enclosures for Generator / Exciter are excluded from the scope. Clause altered as below: Installation of enclosures of generator / exciter with all auxiliaries- 5% (If not applicable this payment shall be included in the 1.7.3.7.
8.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- VII Clause no. 1.7.5.2	Erection, / mechanical completion (placement, alignment and grouting / welding / fixing etc.) of gland steam condenser, drain coolers, CF coolers, mot, generator coolers	CF coolers appearing in clause 1.7.6.4 also. Please clarify	CF cooler is excluded and ECW pumps included in clause no 1.7.5.2

<table>
<tr><th>Sl. no</th><th>Published in</th><th>Existing clause</th><th>Bidder's queries</th><th>Clarifications issued by BHEL</th></tr>
<tr>
<td>9.</td>
<td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- IX
Clause no. 1.9.2</td>
<td><u>Unit-1 (Package-A)</u>
(A1) STEAM TURBINE & AUX. : WEIGHT DETAILS - BHEL HARDWAR
<table>
<tr><th>SL NO</th><th>PKG. NO</th><th>DESCRIPTION</th><th>NET WT(kg)</th></tr>
<tr><td>80</td><td>77203/0</td><td>Impulse pipes (carbon steel)</td><td>800</td></tr>
<tr><td>81</td><td>77204/1</td><td>Pressure instruments & sensors</td><td>150</td></tr>
<tr><td>82</td><td>77204/2</td><td>Temp. Instruments & sensors temp. Instruments & sensors</td><td>204</td></tr>
<tr><td>83</td><td>77204/3</td><td>Level instruments & sensor level instruments & sensor</td><td>150</td></tr>
<tr><td>84</td><td>77205/0</td><td>Transmitters & J.B.of bearings</td><td>72</td></tr>
<tr><td>85</td><td>77206/0</td><td>Impulse pipes (Alloy steel and SS)</td><td>360</td></tr>
<tr><td>86</td><td>77207/0</td><td>Impulse pipes</td><td>2750</td></tr>
</table>
</td>
<td>Whether these C & I items are included in the scope.</td>
<td>The sl no 80 to 86 shown in the adjacent table are excluded from the scope.</td>
</tr>
</table>

<table>
<tr><th>Sl. no</th><th>Published in</th><th>Existing clause</th><th>Bidder's queries</th><th>Clarifications issued by BHEL</th></tr>
<tr>
<td>10.</td>
<td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- IX
Clause no. 1.9.2</td>
<td>
<u>Unit-2 (Package-B)</u>
(A) STEAM TURBINE & AUX. : WEIGHT DETAILS - BHEL HARDWAR
<table>
<tr><th>SL NO</th><th>PKG. NO</th><th>DESCRIPTION</th><th>NET WT(kg)</th></tr>
<tr><td>126</td><td>77203/0</td><td>Impulse pipes (carbon steel)</td><td>800</td></tr>
<tr><td>127</td><td>77204/1</td><td>Pressure instruments & sensors</td><td>150</td></tr>
<tr><td>128</td><td>77204/2</td><td>Temp. Instruments & sensors temp. Instruments & sensors</td><td>204</td></tr>
<tr><td>129</td><td>77204/3</td><td>Level instruments & sensor level instruments & sensor</td><td>150</td></tr>
<tr><td>130</td><td>77205/0</td><td>Transmitters & J.B.of bearings</td><td>72</td></tr>
<tr><td>131</td><td>77206/0</td><td>Impulse pipes(Alloy steel and SS)</td><td>360</td></tr>
<tr><td>132</td><td>77207/0</td><td>Impulse pipes</td><td>2750</td></tr>
</table>
</td>
<td>Whether these C & I items are included in the scope.</td>
<td>The sl no 126 to 132 shown in the adjacent table are excluded from the scope.</td>
</tr>
</table>

<table>
<tr><th>Sl. no</th><th>Published in</th><th>Existing clause</th><th>Bidder's queries</th><th>Clarifications issued by BHEL</th></tr>
<tr>
<td>11.</td>
<td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- IX
Clause no. 1.9.2</td>
<td><u>Unit-1 (Package-A) and Unit-2 (package-B)</u>
E1. Boiler Feed Pumps (Motor driven & Turbine Driven)
<table>
<tr><th rowspan="2">SL. No.</th><th rowspan="2">DESCRIPTION</th><th colspan="2">TOTAL QTY/ UNIT</th><th colspan="2">WEIGHT (kgs) / Item</th></tr>
<tr><th>TD BFP (2 nos.)</th><th>MD BFP (1 no.)</th><th>TD BFP</th><th>MD BFP</th></tr>
<tr><td>8</td><td>Re circulation Valve</td><td>2</td><td>1</td><td>1500</td><td>1500</td></tr>
<tr><td>9</td><td>Conical Suction Strainer at BFP suction</td><td>2</td><td>1</td><td>1700</td><td>1700</td></tr>
<tr><td>10</td><td>Basket type Suction Strainer at BP suction</td><td>2</td><td>1</td><td>3000</td><td>3000</td></tr>
</table></td>
<td>Whether these recirculation valves and strainers are included in the scope.</td>
<td>The sl no 8, 9 and 10 shown in the adjacent table are excluded from the scope.</td>
</tr>
</table>

<table>
<tr><th>Sl. no</th><th>Published in</th><th>Existing clause</th><th>Bidder's queries</th><th>Clarifications issued by BHEL</th></tr>
<tr><td>12.</td><td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- IX
Clause no. 1.9.2</td><td><u>Unit-1 (Package-A) and Unit-2 (package-B)</u>
E2. Condensate Extraction Pumps (CEP)
<table><tr><th>Sl No</th><th>DESCRIPTION</th><th>Total Qty / Unit</th><th>Weight (kgs) / item</th></tr><tr><td>5</td><td>Basket type Suction Strainer at CEP suction</td><td>3</td><td>2000</td></tr></table></td><td>Whether these recirculation valves and strainers are included in the scope.</td><td>The sl no 5 shown in the adjacent table is excluded from the scope.</td></tr>
<tr><td>13.</td><td>Techno commercial bid
Volume-I Book-I
Volume-IA Part-I
Chapter- IX
Clause no. 1.9.2 Foot note 1 to break up weight details</td><td>A lump sum price is to be quoted in the price bid for Erection & Commissioning of STG system consisting of all equipments detailed under Clause no 1.9.1(Weight schedule-summary) of this chapter that shall also cover works like integral piping, and final painting, as applicable. The Lump sum quoted value for Erection Works shall include the Variation of +15% (Fifteen percent) in total indicated weight (6916 MT). In case ……. ……. ……. ……. …….. …… lump sum quoted/accepted value by 115% of total indicated weight.</td><td>Weight variation: +15%.

In GCC +or- 15% but in TCC +15%. only Clarify)</td><td>In GCC, the variation in executed value is addressed.
In TCC, the rate per unit is addressed if the quantity exceeds.</td></tr>
</table>

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
14.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XII Clause no. 1.12.4	The contractor has to make his own arrangement to receive the Generator Stator from the truck for placing nearer to the lifting point of Portal Gantry Crane (near 'A' row columns).	Clear scope for Stator unloading is to be given Drawing to be given for Unloading & size of the stools, if any is required?	<u>For unit -1 (Package-A)</u> Generator stator already unloaded <u>For unit -2 (Package-B)</u> Generator stator will be brought just below the portal gantry crane location for unloading. The stator has to be unloaded with the help of portal Gantry crane. Hence no additional stools are required.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
15.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.11	**<u>Generator Stator Lifting:</u>** **<u>For unit -1</u>** Generator stator is already received and unloaded at site 50 Mtrs (approx.) away from foundation / …… …… …… …… ……. Engineer are in the scope of the Bidder at his cost. Providing skilled operator for the operation of portal …… ……. …… …….. …… within the quoted rate. **<u>For unit -2</u>** Generator stator will be transported from HARIDWAR works to site on special wagon / Trailer. This will be received at site nearer to the lifting point of Portal Gantry Crane (near 'A' row columns). Unloading of Generator Stator from wagon / trailer, lifting of stator and shifting ….. ……. ……. …….. ……. …… …….. contractor at his cost.	<u>Generator stator lifting:</u> Clarifications required near A row column. Exact location of stator unloaded.	Bidders are expected to visit site to have clear idea on the unloaded location of the generator stator for Unit-1. <u>The following clause is added to the existing clause of unit -2.</u> Providing skilled operator for the operation of portal crane is by the contractor at his cost.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
16.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.12	Transportation of CO_2 & H_2 cylinders from the store and filling of Gas in the generator stator cooling systems, etc., as and when required till the unit is commissioned and handed over shall be the responsibility of the contractor.	Please confirm whether it is till handing over of unit or completion of commissioning.	Clause altered as below: Transportation of CO_2 & H_2 cylinders from the store and filling of Gas in the generator stator cooling systems, etc., as and when required shall be the responsibility of the contractor for commissioning / operation activities for six months after synchronization of the Unit or till handing over of the Unit to customer, whichever is earlier.
17.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.13	BHEL will provide suitable Crane at free of hire charges ……. …… …… ……. ……carried out by the contractor with in quoted rate.	Is erection of valves and filters of Deaerator are included in the scope	Deaerator including all loose items, valves, stand pipes, root valves, fittings are included in the scope of contract.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
18.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.14	The feed water storage tank will be supplied in three sections with feed pipe, heating steam header, spray nozzles, supports etc., in loose components. These are to be erected, aligned & welded in position. Welding, NDT & heat treatment if required shall be carried out by the contractor within quoted rate.	Please provide Drawing for FST / De-aerator or No of welding joints and thickness of FST and De-aerator assembly works. In this clause it is mentioned that the tank will be supplied in three sections whereas in chapter IX Bill of Quantity it is given as five sections. Please clarify	Drawing-GA of spray cum tray deaerator is enclosed. Feed water storage tank is supplied in five (05) sections.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
19.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.20	The contractor shall have to carry out the condenser tubes insertion and expansion at site after the installation of condenser on their foundation. Before insertion of tubes the contractor shall check for absence of any dents mechanical damages or any other defects of tubes caused during storage or transportation. Tube should be thoroughly internally cleaned of all extraneous matter. Only fine emery paper shall be used for cleaning the tubes at the ends where expansion has to be carried out.	Ongoing through the document, we understand that Condenser tubes will be supplied as bought out items, and same has to be inserted, expanded, flaring and bell mouth to be done. Kindly specify the tube material and thickness and nos. Also is welding of tubes envisaged? If so, is an / orbital welding machine required for the same?	Tube material and size are given in Sl no. 26 of this corrigendum. Welding of tubes is not envisaged
20.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.31	All the weld seams shall be properly ground and subjected to 100% radiographic examination. If any paint or rust (other than steam washable paints) noted in the steam side of the condenser parts, these are to be removed either by sand / shot / Grit blasting or buffing method.	Specify the area / components where 100% radiographic examination is involved.	The words "100% radiographic" is excluded from the clause.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
21.			What are the IBR scope involved in bidder scope. What are the equipments and pipe lines come under purview of IBR for the captioned tender.	IBR scope is not involved in this TG contract
22.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.46	All the integral lube and control oil pipelines required TIG welding operations are to be purged with …… … …. ….. …….. …… have to be arranged by the contractor at his cost.	Whether Purging is required for materials other than Stainless steel (SS) also?	The clause is altered as below: All the integral lube and control oil pipelines require TIG welding operations. Purging is required in case integral lube and control oil pipelines are of stainless steel material. The tubes / pipes are to be purged with ……. …….. …….. ……. have to be arranged by the contractor at his cost.
23.			Provide tentative weight details of TG integral piping	Tentative weight turbine integral piping is 135 MT approx.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
24.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.56	Flow nozzles, orifice, spray nozzles etc., forming part of the system (under this scope of work) irrespective …… …….. …… …….. cleaning and / or steam blowing and / oil flushing at site at no extra cost.	Flow nozzles / Orifice under this scope. Clarification required	Tender condition prevails.
25.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.119.1	After Puddle Flange (**-** 3.3 m from "A" row) to condenser. Size 2700 NB (mm). The scope includes erection of CW piping along with RE joints, Butterfly valves and associated fittings / equipments / systems.	Clause Identification no. 1.13.119.1 is appearing twice i.e first at steam turbine and repeats at CW piping. Please provide more clarity on terminal point for CW piping	Clause Id No. 1.13.119.1 appearing for CW piping is to be read as Clause Id No. 1.13.119.6. The terminal point starts from Puddle flange which is located at about 3.3m from the A row. Details on supply and return lines of Circulating Water (CW) Piping is as below: Diameter - NB 2700mm. Material- Carbon Steel plates (as per IS 2062) rolled and welded as per IS 3589.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
26.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XIII Clause no. 1.13.119.5	**5. Bought out Items:** • Turbine Integral Piping Consists of …… ….. ……. ……. Cross around piping …… …….. • Condenser Tubes (welded Austenitic SS GR 316 L) • ……. …….. • ……. …… • Multi ball bearing support for condenser	Please provide Condenser tube & BOI weight details. Confirm whether it is cross around piping or cross over piping	Condenser Tube details : a) Size: OD 28.575 mm X 0.7112 mm thick, length – 14730 mm. b) Material : welded Austenitic SS Tubes Gr 316 L c) Total no of tubes : (2 condensers / each unit: 44000 Nos (approximate) Cross around piping is to be corrected as Cross over piping. Drawing for Condenser support (Multi ball bearing arrangement) is enclosed.
27.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XVII Clause no. 1.17.15 / 1.17.27		Temporary Piping for Steam blowing / Chemical cleaning. Scope clarity required	For Clause 1.17.15:- Temp piping for Steam blowing / Chemical cleaning / oil flushing for the piping erected under the scope of work is to be carried out by the contractor within the quoted rate. For Clause 1.17.27:- Tender condition prevails.

Sl. no	Published in	Existing clause	Bidder's queries	Clarifications issued by BHEL
28.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XVII Clause no. 1.17.43	Suction filter of BFPs, CEPs, and TG bearing filters are to be cleaned, as and when required during flushing / commissioning by the contractor at his cost till the unit is handed over to customer.	Whether cleaning of Suction filter of BFP, CEP is included in the scope.	Cleaning of Suction filter of BFP, CEP is excluded in the scope.
29.	**Techno commercial bid Volume-I Book-I** Volume-IA Part-I Chapter- XVII Clause no. 1.17.66	During the testing and commissioning period, though BHEL's and customer's staff will also be associated in the work, the contractor's responsibility will be to make available resources in his scope till such time the commissioned units are taken by the customer / BHEL.	Please clarify whether it is till taking over by the customer / BHEL	Clause altered as below: During the testing and commissioning period, though BHEL's and customer's staff will also be associated in the work, the contractor's responsibility will be to make available resources in his scope for Six months after synchronization of the Unit or till handing over of the Unit to customer, whichever is earlier.

All other conditions of the tender remain unchanged

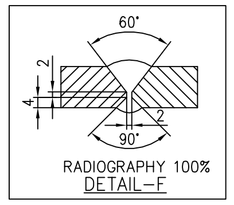
Manager / SCT

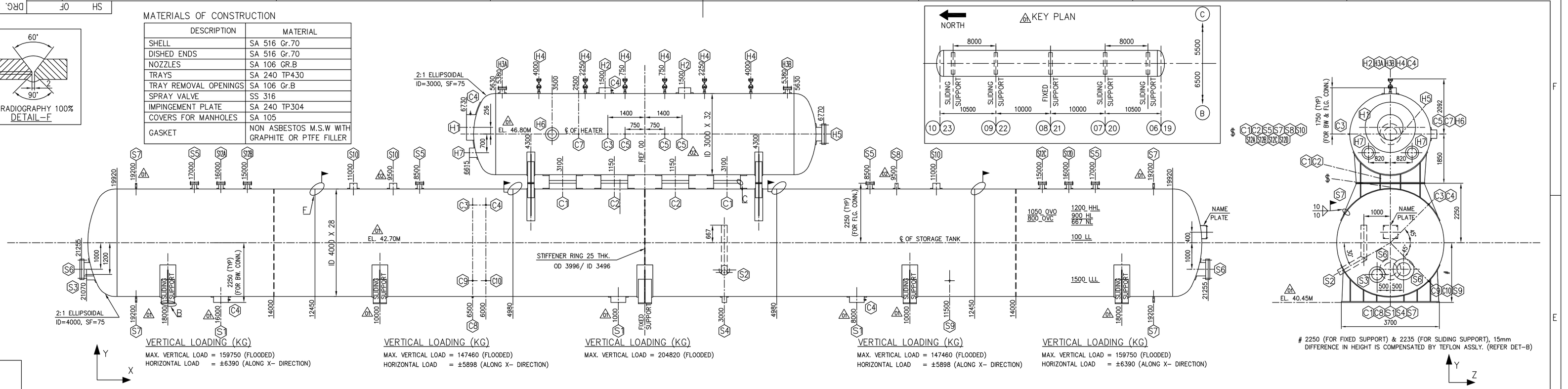
GENERAL DIMENSIONAL LIMITS,FITS & TOLERANCES AS PER HY0230261

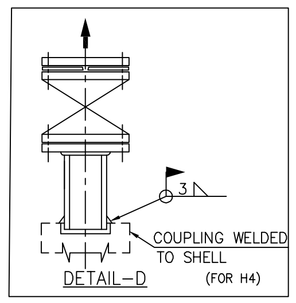
COMPUTER FILE NAME | REF. DRG. NO. | SIGN. AND DATE | INVENTORY NO

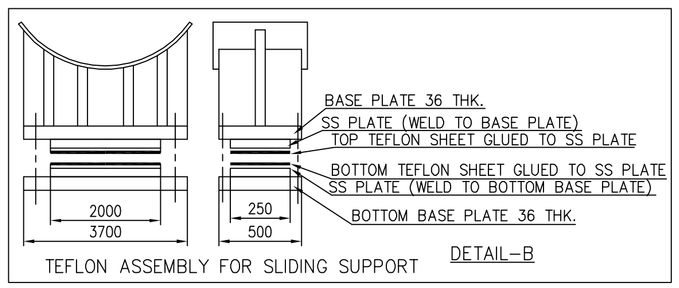
MATERIALS OF CONSTRUCTION

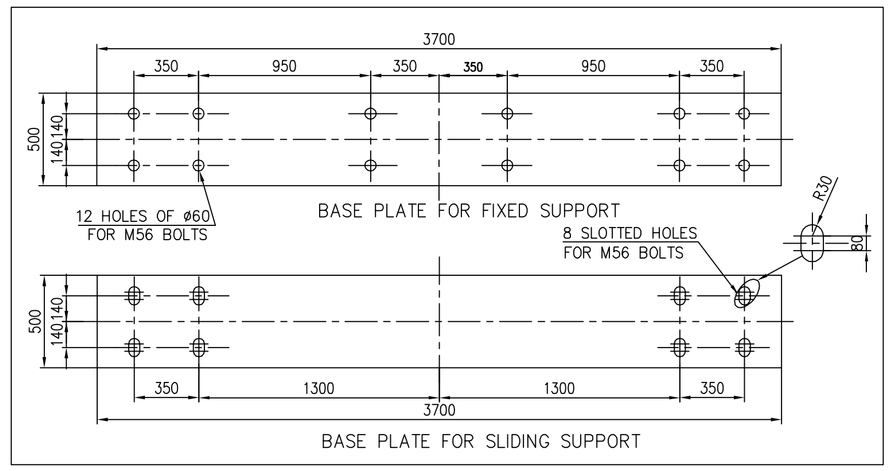
DESCRIPTION	MATERIAL
SHELL	SA 516 Gr.70
DISHED ENDS	SA 516 Gr.70
NOZZLES	SA 106 GR.B
TRAYS	SA 240 TP430
TRAY REMOVAL OPENINGS	SA 106 Gr.B
SPRAY VALVE	SS 316
IMPINGEMENT PLATE	SA 240 TP304
COVERS FOR MANHOLES	SA 105
GASKET	NON ASBESTOS M.S.W WITH GRAPHITE OR PTFE FILLER

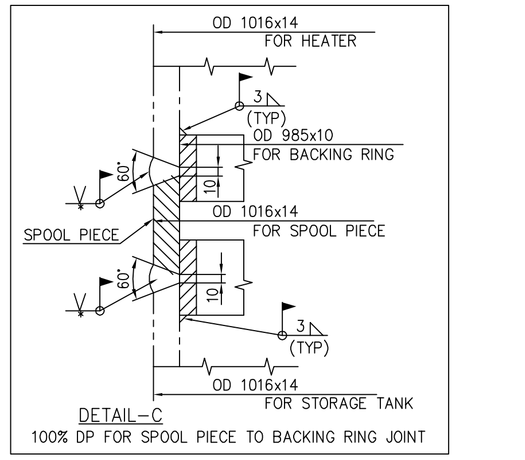


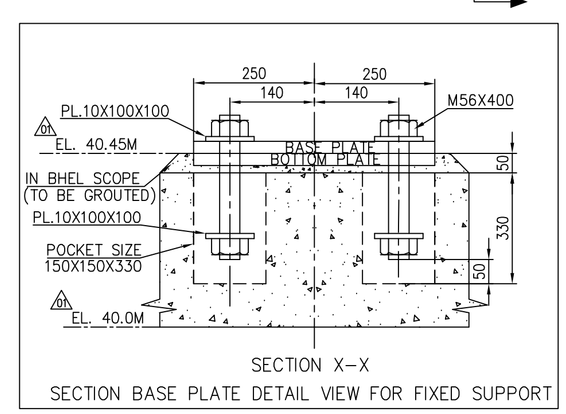












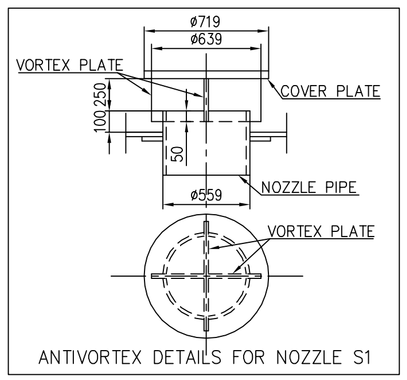
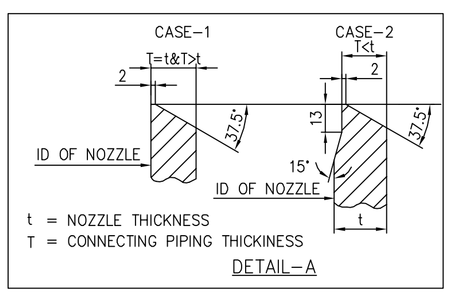


TABLE: DRY, OPERATING & FLOODED LOADS ON SUPPORTS FROM LEFT TO RIGHT

DRY WT. IN Kgs.	OPERATING WT. IN Kgs.	FLOODED WT. IN Kgs.
40280	121960	159750
37100	107445	147460
57440	121960	204820
37100	107445	147460
40280	121960	159750



ALLOWABLE RESULTANT FORCES, MOMENTS & THERMAL MOVEMENTS @ DESIGN CONDITION

REF.	F(Kg)	M(Kg–M)	X (mm)	Y (mm)	Z (mm)	
H1	176156	40955	–37.19	38.12	0	A1
H2	12014	5389	±8.66	45.30	0	
						A1
H7	31661	3195	–36.75	32.61	±4.73	A1
S1	10555	5759	–54.29, –3.93, 27.14	0.85	0	A1
S2	5563	1501	10.18	4.24	–5.88	A1
S3	39671	5208	–70.56	3.56	–1.70	
S4	5021	1153	10.18	0.85	0	A1
S8	4456	783	32.23	14.42	0	A1 A2
S10	6171	1890	–32.23, ±37.32	14.42	0	A1 A2

LIST OF NOZZLE CONNECTIONS

	REF.	DESCRIPTION	SIZE	OD x THK/ CONN. PIPE THK.	QTY	END CONN.	REMARKS	REF.	P&ID REF.
A1	H1	STEAM INLET CONN.	38"	965.0 x 16/ 10	1	BW		H1	N1
	H2	CONDENSATE INLET CONN.	18"	457.0 x 14	2	BW		H2	N2
	H3	SAFETY RELIEF VALVE CONN.	6"	168.3 x 10.97	2	FLG 300# RF		H3	
	H4	VENT CONN.	2"	COUPLING 6000#	6		REFER NOTE–12	H4	N12
	H5	TRAY REMOVAL OPENING CONN.	20"	508.0 x 14	1	FLG 300# RF		H5	
A1	H6	SPARE CONN.	12"	323.9 x 12.7	1	BW		H6	
A1	H7	HPH DRAIN CONN.	10"	273.1 x 12.7/ 6.35	2	BW		H7	N24
	S1	FEED WATER OUTLET CONN.	22"	559.0 x 14	3	BW	WITH VORTEX BREAKER	S1	N3
A1	S2	OVERFLOW CONN.	8"	219.1 x 12.7/ 6.35	1	BW		S2	N14
	S3	INITIAL HEATING STEAM CONN.	16"	406.4 x 12.7/ 9.53	1	BW		S3	N4
	S4	DRAIN CONN.	6"	168.3 x 10.97/ 7.11	1	BW		S4	N13
	S5	VENTILATOR CONN.	6"	168.3 x 10.97	4	FLG 300# RF		S5	
	S6	MAN HOLE CONN.	20"	508.0 x 14	2	FLG 300# RF		S6	
	S7	STAND PIPE CONN.	2"	60.3 x 8.74	4	BW		S7	N15
A1	S8	INITIAL FILLING CONN.	4"	114.3 x 11.13/ 4.0	1	BW		S8	N23
	S9	SAMPLING CONN.	1"	COUPLING 6000#	1			S9	N16
A1 A2	S10	BFP RECIRCULATION CONN.	10"	273.1 x 12.7	3	BW	WITH DISPERSER	S10	N22
	S12	SAFETY RELIEF VALVE CONN.	6"	168.3 x 10.97	4	FLG 300# RF		S12	
	C1	EQUALISER CONN.	40"	1016 x 14	2	BW		C1	
	C2	DOWN CONNER CONN.	40"	1016 x 14	2	BW		C2	
	C3	PRESSURE GAUGE CONN.	1/2"	COUPLING 6000#	2	SW		C3	
	C4	TEMPERATURE GAUGE CONN.	M33x2	COUPLING	5	SCREWED		C4	
A1	C5	PRESSURE TRANSMITTER CONN.	1/2"	COUPLING 6000#	3	SW		C5	
	C7	PG TEST PRESSURE TAP POINT CONN.	1/2"	COUPLING 6000#	1	SW		C7	
	C8	PG TEST THERMOWELL CONN.	M33x2	COUPLING	1	SCREWED		C8	
	C9	TEMPERATURE STUB FOR REMOTE	M33x2	COUPLING	1	SCREWED		C9	
	C10	CONN. FOR RTD	M33x2	COUPLING	1	SCREWED		C10	

* 2 VALVE– SET PR 14 KG/CM^2(g) FOR H3A,B
* 2 VALVE– SET PR 14.5 KG/CM^2(g) FOR S12C,D
* 2 VALVE– SET PR 15 KG/CM^2(g) FOR S12A,B

LIST OF FITTINGS & VALVES

REF.	DESCRIPTION	QTY	REMARKS
F1	COMPOUND PRESSURE GAUGE Kg/sq.cm.(g)	2	–1 to +20
F2	VENT ORIFICE PLATE (SA240 TP304)	6	
F3	PG TEST THERMOWELL	1	
F4	TEMPERATURE GAUGE	5	0–450℃
F5	THERMOWELL	6	
V1	STAND PIPE ISOLATION VALVE	4	2" 800# SW
V2	SAMPLING VALVE	1	1" SW
V3	SRV SET PRESS. & REL.CAP. 83.5 T/hr/EACH)	6	6" 300#/10" 150# RF
V4	VENT VALVE	6	2" 300# RF
V5	ISOLATION VALVE FOR PRESSURE GAUGE CONN	2	1/2" 800# SW
V6	VENT & DRAIN VALVES FOR STAND PIPE	4	1/2" 800# NPT
A2 V7	ISOLATION VALVE FOR PRESSURE TRANSMITTER	3	1/2" 800# SW
V8	ISOLATION VALVE FOR PG PRESSURE TEST CONN	1	1/2" 800# SW

DESIGN DATA

DESCRIPTION			
DESIGN PRESSURE		Kg/cm^2(g)	15 & FULL VACUUM
HYDROTEST PRESSURE FOR ST.TANK		Kg/cm^2(g)	19.5
HYDROTEST PRESSURE FOR HEATER		Kg/cm^2(g)	29.6 A1
ST.TANK DESIGN TEMPERATURE (MAX/MIN)		℃	260/0
HEATER DESIGN TEMPERATURE (MAX/MIN)		℃	415/0
HYDROTEST TEMPERATURE (MAX/MIN)		℃	AMBIENT/17
RADIOGRAPHY			FULL
CORROSION ALLOWANCE	SHELLS/ HEADS	mm	3.2
	RF PADS/ NOZZLES/ FLANGES	mm	1.6
STORAGE TANK CAPACITY (BETWEEN NL & LLL FOR 6 MINUTES CAPACITY)		(cu.m)	300
OPERATING PRESSURE		Kg/cm^2(g)	11.97
OPERATING TEMP.		℃	187
NO OF TRAYS			792
NO OF SPRAY NOZZLES			144
WEIGHTS DRY		(kgs)	212200
WEIGHTS OPERATING		(kgs)	580770
WEIGHTS FLOODED		(kgs)	819240
INSPECTION			AS PER APPROVED QP

NOTES:–

1. HYDRO TEST BLANKING PLATE OF NOZZLES SHALL BE CUT AT SITE AND EDGE PREPARED AS PER DET–A.
2. SPOOL PIECES CONSTRUCTED OF SA516/70 WILL BE SUPPLIED TO AID IN PROPER FIT UP OF DOWN COMMERS AND EQUALIZERS. 2 BACKING RINGS WILL BE SUPPLIED WITH EACH SPOOL PIECE (REFER DET–C).
3. PAINTING
   EXTERNAL: STORAGE TANK AND HEATER– TWO COATS OF HEAT RESISTANT ALUMINIUM PAINT.
   INTERNAL: HEATER– NIL
   STORAGE TANK– TEMPRORY RUST PREVENTIVE PAINT
4. SHIPPING
   HEATER: WILL BE DESPATCHED IN ONE ASSEMBLY.
   STORAGE TANK: WILL BE DESPATCHED IN FIVE SECTIONS.
5. FOUNDATION BOLTS
   M56X400 FOUNDATION BOLT 44 NO'S WITH WASHER WILL BE SUPPLIED.
6. DESIGN CODE ASME SEC VIII DIV 1, 2007, ADD 2009.
7. COUNTER FLANGES ALONG WITH BOLTS NUTS AND GASKETS WILL BE SUPPLIED FOR FLANGED CONNECTIONS.
8. A1 MOVEMENT OF SLIDING SUPPORT FORM COLD TO OPERATING CONDITION IS = ±23.60, ±42.47mm & AT DESIGN CONDITION= ±33.93, ±61.07mm
9. INDICATES SITE WELDING.
10. VENTILATOR CONN. IS A SPARE CONN. PROVIDED WITH BLIND FLANGE, WHICH CAN BE OPENED FOR VENTILATION INSIDE THE STORAGE TANK DURING MAINTAINANCE OPERATION.
11. HEATER SUPPORTS ON STORAGE TANK ARE DESPATCHED LOOSE FOR FINAL WELDING AT SITE.
12. ORIFICE ASSLY. AS PER DET–D SHALL BE WELDED TO COUPLING (H4) AT SITE.
13. HEAVIEST PIECE TO BE HANDLED DURING ERECTION= 60 TONNES.
14. FOR DETAILS OF STANDPIPES REFER DRG. 2–163–19–11560.
15. RTD FOR RTD CONN. IS IN PEM SCOPE.

CLIENT: RAICHUR POWER CORPORATION LTD.

CLIENT'S CONSULTANT: STEAG ENERGY SERVICES (I) PVT. LTD.
CORPORATE OFFICE
A–29, SECTOR–16, NOIDA–201301, INDIA

PROJECT: YERMARUS THERMAL POWER STATION
2X800MW

BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

	NAME	SIGN.	DATE	NO.OF VAR.
DRN.	A.L.RAJAM		04.12.10	
CHD.	UMESH MENON		04.12.10	N.A
APPD.	TSN BHARGAV		04.12.10	

DEPT.	GRADE OF TOLDIM.	SCALE	WEIGHT (KG)	REF. TO ASSY DRG.	ITEM NO.	NO.OF ITEMS
HEE	C/M/F		N.A	N.A	N.A	N.A
CODE 405						

TITLE: GA OF SPRAY CUM TRAY DEAERATOR

CARD CODE

DRAWING NO. 1–163–10–11374 REV. 02

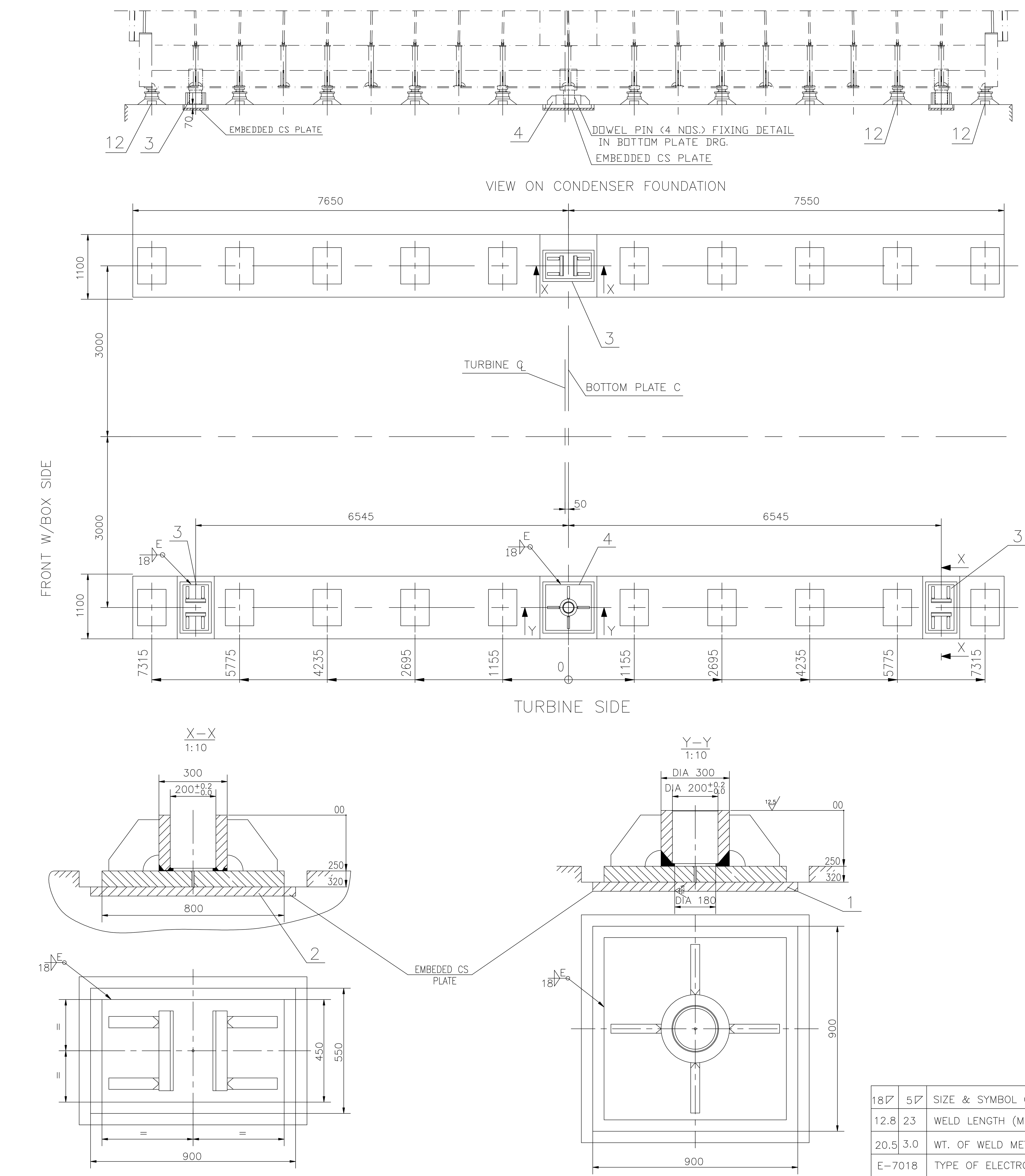
SHT. No 01 NO. OF SHT. 01

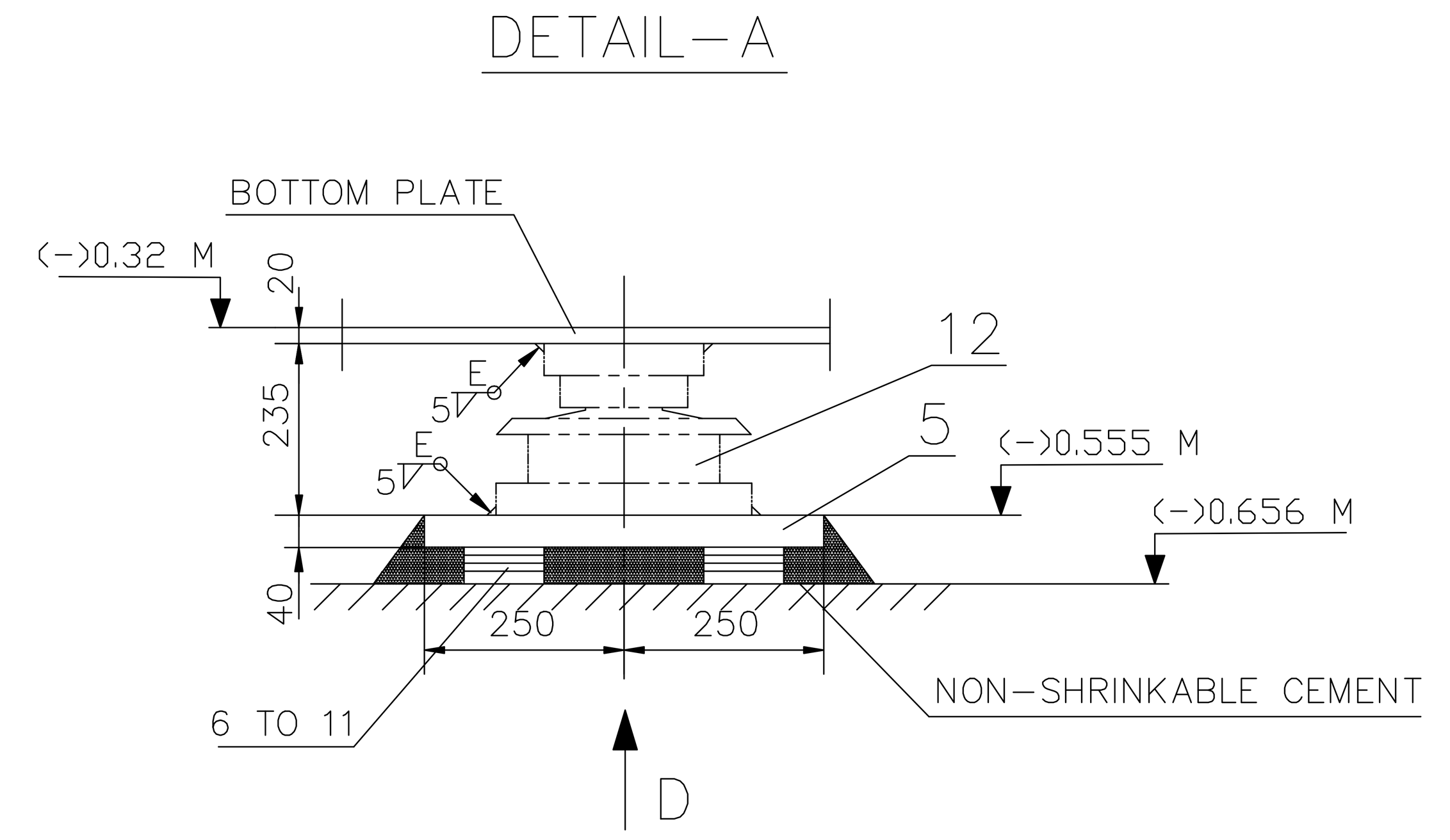
REV.	DATE	ALTERED	CHECKED	APPD	ZONE
02	05.09.12				REVISED IN–LINE WITH COMMENTS FROM CONSULTANT & PEM.
01	28.03.11				REVISED IN–LINE WITH COMMENTS FROM PEM.

प्रथम कोण प्रक्षेपण/FIRST ANGLE PROJECTION

सभी विमाएं मिलिमीटर में हैं।/ALL DIMENSIONS ARE IN mm.

प्रपत्र डीजी 45 (बी)/FORM 45 (B)





TECHNICAL REQUIREMENTS:–

1. PAINTING IS TO BE DONE AS PER HXE PRODUCT STD HE 77001.
2. AFTER FINAL ASSEMBLY OF CONDENSER ENSURE THAT ALL MULTI BALL BEARING SUPPORTS ARE LOADED.
3. AFTER THE INSTALLATION & THE ADJUSTMENT, THE CENTRING SCREWS HAVE TO BE REMOVED IMMEDIATELY AND THE THREADED HOLES TO BE CLOSED BY MEANS OF SHORTS SCREWS (CLOSING SCREWS) WHICH ARE SUPPLIED WITH THE BEARINGS.

REFERENCE DRG.:–

1. CONDENSER GA – 01601070063E177
2. BOTTOM PLATE DRAWING – 01601170034E177

NOTE:–

1. QUANTITY IS MENTIONED FOR ONE CONDENSER ONLY.

QTY.	REMARKS	ITEM No.	DESCRIPTION	UNIT WEIGHT
		013	DEPOSITED METAL	23.50
020	BOI/3A CAT.	012	MULTI BALL BEARING SUPPORT (1250KN LOAD CAPACITY)	164.00
240	78019/1&2-7	011	PLATE (PACKER) 1X100X100	0.08
160	78019/1&2-5	010	PLATE (PACKER) 2X100X100	0.16
080	78019/1&2-5	009	PLATE (PACKER) 6X100X100	0.47
160	78019/1&2-4	008	PLATE (PACKER) 10X100X100	0.79
080	78019/1&2-3	007	PLATE (PACKER) 20X100X100	1.57
080	78019/1&2-2	006	PLATE (PACKER) 32X100X100	2.51
020	78019/1&2-1	005	PLATE (SOLE PLATE) 40X500X640	100.48
001	78018/1&2-2	004	BASE PLATE (FIXED)	464.00
003	78018/1&2-1	003	BASE PLATE (GUIDE)	306.80
003	78014/1&2-2	002	PLATE–II (EMBEDDED IN COND. PEDESTAL)	186.00
001	78014/1&2-1	001	PLATE–I (EMBEDDED IN COND. PEDESTAL)	282.22

18◁	5◁	SIZE & SYMBOL OF SEAM
12.8	23	WELD LENGTH (M).
20.5	3.0	WT. OF WELD METAL (Kg).
E-7018		TYPE OF ELECTRODE

असह्य विमाओं का वर्ग
GRADE OF UNTOLERANCED DIMENSION
मशीनिंग - एए0230208 एम
MACHINING – AA0230208 m
वेल्डिंग - एए0621104 की श्रेणी बी
WELDING–CLASS 'B' OF AA0621104
गैस कटिंग - एए0621101 की सारणी 3
GAS CUTTING–TABLE 3 OF AA0621101

RAICHUR POWER CORPORATION LIMITED
2X800 MW YERAMARUS TPS

Consultant: steag — Steag Energy Services (India), Noida

भारत हेवी इलेक्ट्रिकल्स लिमिटेड, रानीपुर, हरिद्वार
BHARAT HEAVY ELECTRICALS LIMITED, RANIPUR, HARDWAR

	नाम/NAME	हस्ताक्षर/SIGN	दिनांक/DATE
	ANIL	sd/–	25.02.13
जांचा/CHD	ASHISH	sd/–	25.02.13
APPD	S.KANT	sd/–	25.02.13

विभाग/DEPTT.: HXE
कोड/CODE 4222
अनुपात/SCALE 1:40
भार कि.ग्रा./WEIGHT (KG) 8073.0
अग्रेषवर्ती अभिकल्प का संदर्भ/REFER TO ASSLY. DRG. –
शीर्षक/TITLE: CONDENSER SUPPORT
अभिकल्प संख्या/DRAWING NO. 11607170034E177 00
पृष्ठ संख्या/Sheets No. 01 पृष्ठों की संख्या/No. of Sheets 01
A1 साइज/A1 SIZE