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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company. MANUFACTURE AND SUPPLY OF BOLTED STRUCTURES OF AHP/LHP/GHP FOR MAITREE 2X660 STPP 1. OBJECTIVE: The objective of this specification is to manufacture and supply of BOLTED STRUCTURES of AHP/LHP/GHP for 2x660 STPP Maitree project, Bangladesh. 2. SCOPE: The scope comprises of manufacturing of bolted structures as per BHEL detailed drawings, quality plan, marking and dispatch. Total scope is split into various categories mentioned in Annexure I. RFC/GA drawings of each category item is provided along with the tender for understanding of the structure. Each structure is made of various DU's which will be within the transportable limits. These DU's have bolted connections for assembly of the structure at site. Typical work includes fabrication of these DU's which include welding, drilling, rolling, bending etc, inspection (as per approved quality plan), grit blasting and painting. (Rolling required only in category V) Detailed fabrication drawings will be provided by BHEL after placement of PO. Vendor to manufacture exactly as per BHEL detailed fabrication drawings and specifications mentioned in Clause 3 of this specification. Nothing in this specification shall be construed to relieve the Vendor of his responsibility for compliance with the applicable documents/standards. Any conflict between the applicable documents and this specification shall be brought to the attention of BHEL Engineering for resolution. 3. BHEL SPECIFICATIONS AND DOCUMENTATION a. Categorization of Bolted structures and sample drawings – Refer Annexure I b. Quality plan for AHP structures - QP NO.: MAIT:C&AHP: R4R5-R4R6 QP NO.: MAIT:AHP SILO: R4R5-R4R6 c. Painting schedule - PS:MAIT:PG:R676&R4R5. d. General Tolerances - AA0230208, AA0621104, AA0621105 4. FABRICATION DETAIL REQUIREMENTS: Fabrication should be strictly as per BHEL detailed fabrication drawings and QAP. Wherever trial assembly is envisaged, those items will be clearly indicated in the PO. For all trial-assembled components, match marking should be done.					
Ref. Doc	Revisions : Refer to record of revisions :		Prepared : Karthike	Approved : Rajeev Kumar	Date : 23.09.2019

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	All the components fabricated should comply with the following tolerance standards. 1. For drilled holes locating dimensions – AA0230208 (Medium Class) 2. Welded Structure Length & Angles – AA0621104 (Class A) 3. Welded Structures Form & Position – AA0621105 (Class E) Completion Structural scope is categorized into 6 groups as per annexure I. For Each category item its RFC/GA drawing is provided for understanding of the structure. Bolted connections and DU's details will be available in detailed fabrication drawings, which shall be shared only after placement of PO. For better understanding of the work involved Sample drawings are provided against each category .These drawings are only for understanding purpose of the various bolted structure connections. Final fabrication should be strictly as per respective BHEL detailed drawings provided to vendors after placement of PO, the work content like structural members used, bolted connection details may vary from the details specified in the sample drawings. 5. MATERIALS Materials used in the fabrication of AHP/LHP/GHP BOLTED STRUCTURES shall be new, clean, rust free and straightened if necessary before being worked. a) All structural steel material – E350GR SA/IS 2062 as per BHEL standard HY10170. b) Chequered plate – DIN 5922 / BS EN 10363 or Equivalent 6. GRIT BLASTING AND PAINTING OF ALL STRUCTURES: As per following table <table border="1"> <thead> <tr> <th colspan="6">a. For all structural elements, Packing Crates & Transport stiffeners</th> </tr> <tr> <th rowspan="2">Surface preparation & surface profile</th> <th colspan="2">Primer coat</th> <th colspan="2">Intermediate coat</th> <th rowspan="2">Total DFT μ (min)</th> </tr> <tr> <th>Paint</th> <th>No of coats/ DFT</th> <th>Paint</th> <th>No of coats</th> </tr> </thead> <tbody> <tr> <td>Blast cleaning to SA 2½</td> <td>Epoxy zinc phosphate IS 13238</td> <td>01/ DFT=80μ/ coat</td> <td>Epoxy based polyamide cured MIO pigmented intermediate coat</td> <td>02/ DFT=80μ/ Coat Total=160μ</td> <td>240 μ</td> </tr> </tbody> </table> Customer approved Paint suppliers for structural works follow as : 1) M/s Shalimar Paints 2) M/s Jenson and Nicholson 3) M/s Kansai Nerolac 4) M/s Akzo Nobel 5) M/s Asian paints				a. For all structural elements, Packing Crates & Transport stiffeners						Surface preparation & surface profile	Primer coat		Intermediate coat		Total DFT μ (min)	Paint	No of coats/ DFT	Paint	No of coats	Blast cleaning to SA 2½	Epoxy zinc phosphate IS 13238	01/ DFT=80 μ / coat	Epoxy based polyamide cured MIO pigmented intermediate coat	02/ DFT=80 μ / Coat Total=160 μ	240 μ
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7. SUBMITTALS The vendor shall supply the following documentation to BHEL after the job completion - One set of complete manufacturing inspection records (after completion of manufacture) as per enclosed quality plan. - Deviation, if any, resulting in a fabrication process shall be submitted to BHEL Engineers for review and approval. 8. WELDING - Welders carrying out the fabrication activities, shall be AWS D1.1(Latest revision)-qualified - Welding procedures shall be qualified as per AWS D1.1(Latest revision)-PQR, WQR, WPS. - Full penetration welds/ Butt Welds shall undergo RT/UT as per QAP. - Fillet welds shall undergo LPI/MPI as per QP. 9. MARKING & PACKING <u>MARKING</u> - PGMA, DU number and erection mark shall be marked by hard punching and also by painting at both ends of each DU (deliverable unit/ PO item). Ex: For PO with following item. <table border="1" data-bbox="338 1220 1197 1310"> <tr> <th>MATERIAL CODE</th> <th>DESCRIPTION</th> </tr> <tr> <td>09613210002-DU01</td> <td>PLATFROM BEAM : "PB-20"</td> </tr> </table> Marking should be : 96132-DU01 PB-20 Here PGMA is 96132, DU is 01 and erection mark is PB-20. - Small DU's which cannot be marked as above shall have metal tags with the necessary markings on them. The metal tags shall be securely attached to the packages with strong steel binding wire. Each piece shipped separately shall be labelled or tagged properly <u>PACKING</u> - DU's which are less than 1.6MT should be packed in metal crates. Crates shall be manufactured as per BHEL drawings. - Packing list should contain detailed contents of the package. - Two 50mm wide Green & Red touching bands around perimeter of package positioned at two locations should be provided.				MATERIAL CODE	DESCRIPTION	09613210002-DU01	PLATFROM BEAM : " PB-20 "
MATERIAL CODE	DESCRIPTION						
09613210002-DU01	PLATFROM BEAM : " PB-20 "						
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					23	HCSD PUMP HOUSE 1	Maitree-00-UEU-LC-177447-ISG	75	
					24	DH-5 FOR LS	Maitree-00-UEF-LC-177345-ISG	40	
			CATEGORY - V SUPPORT STRUCTURE WITH SS SILO		25	LIME STONE INTERMEDIATE STEEL SILO-1 & 2	Maitree-00-UEB-LC-177384-ISG	750	
					26	LIMESTONE UNDERGROUND HOPPER	Maitree-00-UEA-LC-177378-ISG	50	
			CATEGORY - VI SUPPORT STRUCTURES WITH CONCRETE SILO		27	BOTTOM ASH SILO NEAR JETTY-1	Maitree-00-UGY-LC-177582-ISG	250	
					28	FLY ASH SILO NEAR JETTY 1,2 & 3	Maitree-00-UGY-ED-177581- ISG	400	
					29	GYPSUM SILO-1	Maitree-00-UEB-ED-177399-ISG	250	
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.		TABLE OF COMPLIANCE: OE56100 Vendor to fill up table of compliance, attest and submit along with technical bid. <table><thead><tr><th>CLAUSE NO</th><th>CONFIRMS (YES/NO)</th><th>REMARKS</th></tr></thead><tbody><tr><td>1.0</td><td></td><td></td></tr><tr><td>2.0</td><td></td><td></td></tr><tr><td>3.0)a</td><td></td><td></td></tr><tr><td>3.0)b</td><td></td><td></td></tr><tr><td>3.0)c</td><td></td><td></td></tr><tr><td>3.0)d</td><td></td><td></td></tr><tr><td>3.0)e</td><td></td><td></td></tr><tr><td>4.0)</td><td></td><td></td></tr><tr><td>5.0)</td><td></td><td></td></tr><tr><td>6.0)</td><td></td><td></td></tr><tr><td>7.0)a</td><td></td><td></td></tr><tr><td>7.0)b</td><td></td><td></td></tr><tr><td>8.0)a</td><td></td><td></td></tr><tr><td>8.0)b</td><td></td><td></td></tr><tr><td>8.0)c</td><td></td><td></td></tr><tr><td>8.0)d</td><td></td><td></td></tr><tr><td>9.0)</td><td></td><td></td></tr><tr><td>10.0)</td><td></td><td></td></tr><tr><td>11.0)</td><td></td><td></td></tr></tbody></table>			CLAUSE NO	CONFIRMS (YES/NO)	REMARKS	1.0			2.0			3.0)a			3.0)b			3.0)c			3.0)d			3.0)e			4.0)			5.0)			6.0)			7.0)a			7.0)b			8.0)a			8.0)b			8.0)c			8.0)d			9.0)			10.0)			11.0)		
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			Rev. No.	Date	Revision Details	Revised By	Approved By
			00	15.10.2019	First issue	KARTHIK	RAJEEV KUMAR
Ref. Doc.							