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JOB SPECIFICATION FOR GRIT EQUIPMENT OF SEWAGE TREATMENT PLANT

Revisions: Refer to record of revisions	Prepared by :	Checked by :	Approved by :	Date :
	Pradeepa	AKS	MSSN	08.07.17

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1.0 INTENT OF SPECIFICATION

This Job specification covers the technical details specific to the project.

This Job specification and its Annexures shall be read in conjunction with Technical Purchase Specification for Grit equipment PY-51281, and other annexures/ standards.

2.0 PROJECT DATA:

Project	:	1 x 4.5 MLD Sequential Batch reactor (SBR) based Sewage Treatment Plant (STP)
Customer	:	M/s. BHEL-Bhopal (BHEL In-house requirement)
Project Location	:	BHEL-Bhopal Township, Barkhera.
Plant Capacity	:	4.5 MLD (average flow)
Peak Factor	:	1.2
Peak Flow	:	5.4 MLD
Consultant	:	Nil

3.0 DATA SHEETS OF GRIT EQUIPMENT

S. No	DESCRIPTION	UNIT / REQUIREMENT	PARAMETERS
1	Average flow	MLD	4.5
2	Peak flow	MLD	5.4
3	Size of grit chamber	m	L2.4x W2.4xSWD1.5
4	Free Board	m	0.3
5	Grit Classifier		
	Type of mechanism		Screw type
	Motor rating	HP	Bidder to specify
	Make		As per supplier
	Mounting		Shaft
	Class of insulation		F
	Degree of protection		IP 55
	Voltage	V	3 Ph, 415V AC +10%-10%
	Motor Speed	RPM	1500
	MOC of classifier component		MSEP / SS304 / CI



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6	Organic Return Pump		
	Motor rating	HP	Bidder to specify
	Make		As per supplier
	Mounting		Shaft
	Shaft		SS304
	Impeller		SS304
	Class of insulation		F
	Degree of protection		IP 55
	Voltage	V	3 Ph, 415V AC +10%-10%
	Motor Speed	RPM	1500
	Speed reduction		Geared/Pulley/Belt
7	Grit Separator scraper		
	Scraper motor rating	HP	1
	Class of insulation		F
	Degree of protection		IP 55
	Voltage	V	3 Ph, 415V AC +10%-10%
	Motor Speed	RPM	1500
	Torque Protection		Electro-Mechanical
8	Gear Box details		
	Type		Foot Mounted Helical/Bevel Gear
	Make		As per supplier
9	MOC		
	Bridge		Structural Steel
	Structural under water parts		SS 304
	Vertical shaft		SS 304
	Scraper arms with blade		SS 304
	Scoop Boxes		SS 304
	Feed deflector		SS 304
	Overflow weir plate		SS 304
	Drive Head		CI
	Hardware and anchors		Wetted part SS304
	Hardware and anchors		Dry Part GI

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4.0 ORDER OF PRECEDENCE

This specification shall be read in conjunction with all other specifications and documents enclosed to it. Any conflict between referenced documents shall be identified and indicated. When resolving conflicts the following order of precedence shall govern:

- (1) Job specifications (PY-AS-04-M096-8436-03)
- (2) Standard specifications (PY-51281)
- (3) Annexures
- (4) Standards and codes as applicable

5.0 ENCLOSURES

1. Check List
2. Typical Grit Scheme Drawing
3. QAP Format
4. Master Document List

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6.0 PRICE SCHEDULES

SL. NO.	DESCRIPTION	QTY.	UNIT PRICE (Rs)	TOTAL PRICE (Rs)
1.0	DESIGN, ENGINEERING, MANUFACTURE & SUPPLY:			
1.1	Grit equipment as per specification	1 set		
1.2	Special Tools & Tackles	1 set		
1.3	Commissioning and Erection Spares [Item wise list of commissioning and erection spares with unit rate and quantity to be furnished by bidder)	1 set		
2.0	SUPERVISION SERVICES (E&C)			
2.1	Per diem rates including boarding, lodging & local travel	2 days		
2.2	Travel expenses from vendor works to site and back for Engineer per visit (This shall include charges if any for travel time)	1 visit		
	TOTAL (1.1+1.2+1.3+2.1+2.2)			
	OPTIONAL PRICE			
3.0	RECOMMENDED SPARES			
3.1	2 years recommended spares along with their quantities and unit rate for normal trouble free operation of the system described in Sl. No. 1.1 above based on bidders' experience. <i>Note: List for recommended spares and it's unit rate to be furnished by bidder.</i>	RO		

NOTES:-

- Bidder to quote strictly as per BHEL's NIT requirements.
- Bidder to note that this is a LUMP SUM Turn-Key Order. Any additional claim after placement of order will not be entertained under any circumstances.
- Bidder to fill up the above prices manually put his seal & signature and submit the same for price bid opening.

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4. Evaluation of L1 bidder shall be based on TOTAL PRICE (Rs.) (SL No.1.0 & 2.0) mentioned above.
5. The number of visit and no. of days, listed above, for supervision of erection and commissioning is based on our estimate. However, payment shall be made on actual basis based on the per diem rates.
6. Bidder shall raise any pre-bid queries (if any) prior to preparation and finalization of their offer. With respect to Purchaser's Clarification to pre-bid queries, Bidder to submit their offer without any deviations.
7. Bidder to quote the base rates only. All Applicable taxes and duties to be indicated shall be indicated separately.
8. Bidder to quote separately, in an identical format, 2 years operational spares (for Bidder's supply items) item wise with recommended quantity and unit rate. However ordering of the same shall be at the sole discretion of BHEL.

BIDDER'S SIGNATURE

NAME:

DATE

COMPANY SEAL

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RECORD OF REVISIONS				
Rev. No.	Date	Revision Details	Revised By	Approved By
00	12.07.17	First Issue	-----	MSSN

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TECHNICAL PURCHASE SPECIFICATION FOR GRIT EQUIPMENT

Revisions:	Prepared by :	Checked by :	Approved by :	Date :
Refer to record of revisions	Pradeepa	AKS	MSSN	12.07.17

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1.0 INTENT OF SPECIFICATION

This specification is intended to cover the general requirements for design, fabrication, manufacture, testing at manufacturer's works, and delivery in properly packed condition suitable for transport, of Grit equipment including all accessories and complete in all respects.

- 1.1 This specification shall be read in conjunction with its enclosures. In case of any discrepancy arising between this job specification & its enclosures, wherein more than one level (i.e. both less stringent level and more stringent levels) of same requirement have been indicated for a particular item, the most stringent of all shall be followed and shall relevantly over-ride others. Otherwise, the requirements indicated in this job specification shall be considered as additional requirements to the ones indicated in the enclosures. Further, if a requirement in this specification or its enclosures, calls for decision of owner/BHEL, it shall be bidder's sole responsibility to clearly bring out the same before submitting technical tender offer, so as to enable owner/BHEL to furnish their decision. If such a requirement is not duly addressed by bidder during tender stage and same comes out during order execution stage, it shall be binding on the bidder to comply with the decision furnished by owner/BHEL then, without any cost, delivery, or any other commercial implications.
- 1.2 Any additional equipment, material, etc., which are not specifically mentioned here, but are required to make the supplied equipment complete in all respect, in accordance with the intent of this technical specification, contractual agreement, statutory requirements, relevant/applicable codes/standards, good engineering practices, and for safe and trouble-free operation, shall be deemed to be covered under the scope of this specification.

2.0 GENERAL INFORMATION / REQUIREMENTS

- 2.1 This specification also includes the supply of commissioning spares as required, special tools & tackles (if any) necessary for operation & maintenance. These shall form an integral part of the supply for the above package irrespective of being separately or explicitly indicated in this specification/tender-correspondence/purchase - order. However, recommended spares for two (2) years trouble free operation shall be quoted separately and shall not form an integral part of the supply for the above package. If required to be ordered, requirement of 2 years recommended spares shall be explicitly indicated in this specification/tender correspondence/purchase order.
- 2.2 The design, manufacture, inspection of the equipment and its accessories shall comply with latest edition of all currently applicable standards, regulations and safety codes. Nothing in this specification shall be construed to relieve the Bidder of his responsibility.
- 2.3 All materials supplied under this contract shall be new and unused. All indigenous equipment/materials offered should be with ISI mark. Any special approvals that may be applicable for certain items, like for explosion-proof items from CMERI-

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Dhanbad, etc., shall be duly considered and ensured. All imported equipment/materials should have an approval of ASME / API / BS / LPC / FM / UL / BASEEFA / NEC / IEC / NFPA / AWWA /other-applicable-authority, as the case may be.

- 2.4 All equipment/items supplied shall conform to the provisions of statutory & other regulations in force in India and the State/Province where the project is executed, such as the Indian Factories Act, Indian Electricity (Supply) Act, Indian Electricity Act, Indian Electricity Rules, International Electric Technical Commission (IEC) Publication, Environmental Rules, Pollution control norms etc.
- 2.5 Supplies shall be rendered in conformity with proven design principles. The purpose of this contract must be fulfilled in its entirety with the maximum of reliability and economy guaranteed.
- 2.6 All the components shall be so designed that repairs and overhauling is minimum and can be carried out easily in the shortest possible time.

3.0 SCOPE OF SUPPLY

- 3.1 Grit equipment consisting of inlet guide / turning vanes, grit scraper, motor, speed reduction mechanism, structural bridge, classifier mechanism, motor and organic return pump with motor.
- 3.2 Complete set of accessories including channels, mounting bracket, side members, protection plate, blinding plate, side sealing, anchorage, fasteners foundation bolts, nuts, inserts, packer plates etc., including any steel embedded parts, if necessary. All fasteners & foundation hardware shall be galvanized.
- 3.3 The materials of construction of all the equipment and components shall be as per the job specification.
- 3.4 Suitable lifting lugs are to be provided for lifting of the equipment.

4.0 DESIGN AND CONSTRUCTION

4.1 GRIT EQUIPMENT

The sewage after passing the screen channel, is further routed to the grit chamber for the removal of grit/inorganic matter. There shall be inlet guide vanes / turning vanes to direct the sewage in to the grit chamber. One no. mechanical grit mechanism is provided. A bypass channel across grit chamber is provided for operation in case of shutdown of mechanical grit mechanism.

Grit Collector mechanism to be supplied by the bidder shall be suitable for mounting in RCC tank. The mechanism shall consist of steel superstructure, torque arms with rake blades and scoops, central rotating vertical pipe shaft, drive head with dial

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indicator for torque indication (or electronic shear pin). A series of inlet guide vanes / turning vanes shall be provided at the inlet of grit chamber for proper distribution of flow.

The grit separator shall be square in size. A Central drive mechanism of worm reduction type driven through helical gear and motor or by geared motor shall be mounted on the structural steel platform spanning the tank. Coupled to the drive head is a center shaft. Attached to the center shaft are torque arms provided with rake blades and scoops. The grit settled in the tank bottom shall be raked outwardly by the torque arms and dropped into a sludge hopper from where it will be lifted by the screw conveyor for disposal. There shall be a steady bearing attached to the tank floor for locating center shaft and preventing its lateral movement.

All exposed steel parts shall be sand blasted and painted with epoxy. All wetted parts shall be in stain steel 304. The drive shall be provided with electro-mechanical device, torque indicating arrangement and mechanical trip contacts with electrical overload relays. Flow regulating vanes shall be provided at the inlet side of the collection chamber and shall be of FRP. The vanes shall be adjusted as per the flow requirement. The weirs at the outlet of grit chamber shall be SS 304 with minimum 3-mm thickness or FRP with minimum thickness of 6 mm. The spacing of anchor bolts of SS 304 for the fixing of the weir shall not be more than 450 mm.

The classifier mechanism shall comprise of a screw driven by a suitable motor. The material of construction of the mechanism shall be MSEP / SS304 / CI of suitable dia. The length of screw shall be such that the grit can be elevated up to the discharge end. SS puddle pipe shall be provided in the concrete trough at the discharge point of wet grit.

Organic Return Pump

An organic return pump with wetted parts in SS304 shall be provided. This shall be vertical propeller pump comprising of pump shaft and propeller. The organic return pump shall serve to return the organics from grit wash back into the outlet of grit chamber.

5.0 DATA SHEETS

For datasheets refer to Job Specification for Grit equipment of Sewage Treatment Plant.

6.0 ELECTRICALS

Motors

All electrical motors shall be of weather proof design suitable for 415 V $\pm$ 6%, 50 $\pm$ 3 HZ, Insulation Class F, Temperature rise limited to class-B, enclosure as per IP-55. The motor shall be of squirrel cage induction type as per IS-325 type TEFC design, and suitable for DOL starting. Motor Efficiency Class: IE3 as per IS 12615.

Motors shall be complete with terminal block (capable of being turned 360 Deg. C in steps of 90 deg.). Terminal box shall be provided with weather proof cable gland suitable to the power

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cable specified by BHEL during detailed engineering stage. Terminal Block suitable for fault current of 50kA for 0.25 seconds.

Power cable is not in scope of sub-vendor but all cable glands and lugs at the terminal box are in the scope of Bidder. The cable glands shall be of nickel plated brass. Suitable canopy (galv. sheet) shall be provided on the motors and the fasteners shall be galvanized. Motor's body shall be epoxy painted after proper surface preparation. Motor shall be provided with space heater, if the rating of motor is above 22KW.

Earthing:

Earthing is in BHEL scope. However provision for equipment earthing like earth terminals, common earth plate shall be provided on the equipment.

LCS

LCS is in BHEL's scope.

Cables:

- a) Power cables upto the motor terminals are in the scope of BHEL.
- b) Bidder to supply all cable lugs and glands. Glands shall be double compression type Nickel plated Brass (ET) with back nut and PVC shroud. Cable lugs shall be tinned copper heavy duty lug of nickel plated brass, double compression type.

7.0 INSTRUMENTATION:

All the instrumentation and the cables are not in bidders scope of supply. These are in the scope of BHEL.

8.0 CONSUMABLES

Bidder shall furnish the list of chemicals / consumables required for the commissioning, operation and maintenance of the system.

9.0 LUBRICANTS

Bidder shall provide the flushing oil required, together with first fill of oil and/or grease for parts of equipment requiring lubrication under Bidder's scope. For all types of lubricants selected, equivalent grade of other makes shall be mentioned which can be sourced locally.

10.0 ERECTION & COMMISSIONING SPARES

The Bidder shall also supply erection & commissioning spares along with his main equipment as per his experience, for replacement of damaged or unserviceable ones during the execution of the project at site, to avoid delays in the project commissioning. This shall form part of the main equipment supply.

11.0 SPECIAL MAINTENANCE TOOLS AND TACKLES

One set of special tools and tackles required for operation, maintenance, inspection and repair, neatly packed in steel boxes complete with operating instructions for Bidder's scope of equipment shall form part of the main equipment supply and a separate list for the same shall be furnished along with bid.

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12.0 RECOMMENDED SPARES

A minimum requirement of spare parts for the overall plant based on the experience of the Bidder sufficient for two (2) years of normal trouble free operation shall be recommended and quoted separately as optional item. Bidder shall furnish the description along with recommended quantity for each item in the offer.

13.0 QUALITY & INSPECTION

Quality Assurance Program

To ensure that the equipment and services under the Scope of Contract whether manufactured or assembled within the Bidder's works or at his Sub-Vendor's premises or at the Owner's site or at any other place or work are in accordance with the specifications, Bidder shall adopt suitable quality assurance program to control such activities at all points, as necessary. Such program shall be outlined by the Bidder and shall be finally accepted by the Owner / Authorized representative after discussions before the award of Contract. The QA program shall be generally in line with ISO-9002/IS-14001. A quality assurance program of the Bidder shall generally cover the following:

System for shop manufacturing and site erection control including process controls, fabrication and assembly controls.

Quality Assurance Documents

The Bidder shall submit required no. of copies of the following Quality Assurance documents:

- Material test reports on components as specified by the specification and approved Quality Plans.
- The inspection plan with verification, inspection plan check points, and verification sketches, if used and method used to verify that the inspection and testing points in the inspection plan were performed satisfactorily.
- Sketches and drawings used for indicating the method of traceability of the radiographs to the location on the equipment.
- Non-destructive examination results, reports including radiography interpretation reports.
- Factory tests results for testing required as per applicable codes and standard referred in the specification and approved Quality Plans.
- Inspection reports duly signed by QA personnel of the customer and Bidder for the agreed customer hold points.

The equipment shall be guaranteed to meet performance requirements required by this specification and rectification shall be carried out until satisfactory results are obtained. The Owner reserves the right to reject the equipment should the performance values fall short of those indicated in the schedule of Technical data sheets.

Quality Plan:

Bidder to furnish Quality Plan [Supply Quality plan] to BHEL along with offer in their standard format for general review by BHEL. During Detailed engineering, in addition to various tests indicated in this specification, Quality plan will be reviewed with respect to standard Inspection, standard Engineering practices, applicable standards, code etc. Accordingly,

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various tests required, stages of inspection and appropriate agencies for Inspection will be intimated. Bidder to abide by the same.

14.0 TESTS & INSPECTION:

The manufacturer shall conduct all tests required to ensure that the equipment furnished shall conform to the requirements of this specification and in compliance with requirements of applicable codes and standards. The particulars of the proposed tests and the procedures for the tests shall be submitted to the Purchaser/Consultant for approval before conducting the tests.

15.0 INSPECTION AGENCY:

BHEL/Third Party appointed by BHEL/Customer

The various inspection stages will be witnessed by individual agencies (or) Group of Agencies as per above, in line with approved quality plan.

16.0 PROTECTION FOR SHOP FABRICATED ITEMS:

16.1 All coated surfaces shall be protected against abrasion, impact, discoloration and any other damages. All exposed threaded portions shall be suitably protected with either a metallic or nonmetallic protecting device. The parts which are likely to get rusted due to exposure to weather, should also be properly treated and protected in a suitable manner. All exposed metallic surfaces subject to corrosion shall be protected by shop application of suitable coatings. All surfaces which will not be easily accessible after the shop assembly, shall beforehand be treated and protected for the life of the equipment. All surfaces shall be thoroughly cleaned of all mill scale, oxide and other coatings and prepared in the shop.

16.2 The surfaces that are to be finish-painted after installation or require corrosion protection until installation, shall be shop painted with at least two coats of primer. The finished colors shall be as per manufacturer's standards.

16.3 Shop primer for all steel surfaces which will be exposed to operating temperature below 95°C shall be selected by the Bidder after obtaining specific approval of the Purchaser regarding the quality of primer proposed to be applied.

16.4 All other steel surfaces which are not to be painted shall be coated with suitable rust preventive compound subject to the approval of the Purchaser.

16.5 All material shall be delivered in a clean and usable condition. Openings shall be securely covered against entry of foreign material where appropriate.

17.0 PACKING AND TRANSPORTATION:

All equipment shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at site till the time of erection. Bidder shall follow necessary road safety rules and shall obtain permission from highway authorities for goods movement. However, these aspects shall be taken into consideration in the design of the packing for the system.

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18.0 NAME PLATES & TAG PLATES:

- a. Components whose identity is important for operation and maintenance of the plant shall be provided with permanently attached tag bearing the Purchaser's coding together with relevant text clearly inscribed.
- b. A corrosion-resistant nameplate shall be attached to each unit in a clearly visible, easily accessible location. The nameplate shall be stamped with the following information:
 - Manufacturer's name
 - Manufacturer's model number
 - Manufacturer's serial number
 - Purchaser's equipment tag number (item No.)
 - Service name
 - Weight (kg)
 - Hydrostatic test pressure, Bar. (g)
 - Other design information of the flow media like flow rate, temperature, pressure etc.
- c. Nameplates shall be 3 mm (0.12") thick engraved plate of sufficient rigidity with lettering of a minimum height of 4 mm (0.16"). The method of implementation and labelling will be informed for all components after award of contract.

Identification tags shall be provided and placed on all Bidder furnished items. Tags shall be corrosion resistance, having a larger than diameter of 3 cm, and shall have black identification figures stamped thereon. Figure height shall be larger than 0.5 cm. Tags shall bear the component system designation symbol shown on the Bidder's drawings.

19.0 VENDOR DOCUMENTATION PROCEDURE

The O&M manuals shall contain the following details as minimum:-

- Identification details of the equipment like BHEL PO NO., Vendor's Sl. No., Vendors contact address with tel., fax details.
- Description of the equipment.
- Final Data sheets and Drawings of the equipment as per the list mentioned in this specification.
- O&M Manuals of the equipment.
- Recommended 2 years operational spares.
- Test reports.

The erection documentation shall consist of:

- All drawings/documents,
- All such drawings/documents, not submitted for review, but essential for erection/ commissioning, e.g. assembly drawings, etc.
- Master document list
- Site dispatchable B.O.M.



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20.0 Special Tools & Tackles

Bidder to supply any Special Tools and Tackles as per requirement.

21.0 Documents to be submitted along with the offer

- Process description
- Detailed scope of supply

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Please refer specification, Doc. No. PY-AS-04-M096-8436-03 for equipment technical details. Also, please fill and furnish the following information in the indicated format:

I. KEY INFORMATION

1. Name of the Bidding Company :
2. Registered in (mention the name of the Country) :
3. Name, designation, telex & telephone number and postal address of responsible officer of Bidder to whom all reference shall be made for expeditious coordination. :
4. Name, designation, telex & telephone number and postal address of responsible officer of Indian Agent. :
5. Bidder's proposal number :
6. Bidder's proposal date :
7. Validity of offer, counted from the date of opening of bid :
8. Guaranteed completion period, counted from date of issuance of LOI/TOI :
9. Confirm that Scope of supply and services are exactly as per specification requirement. : Yes/No
10. Confirm technical compliance with specification : Yes/No
11. Confirm that List of Recommended Spares has been furnished as per format II. : Yes/No
12. Confirm that Special Tools & Tackles are as per format III : Yes/No
13. Confirm that deviations ,if applicable, have been furnished as per format V : Yes/No

Signature of Bidder's
Authorized representative with date.....
Date

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II. LIST OF RECOMMENDED SPARE PARTS

Bidder shall tabulate in the proforma below list of all spare parts as recommended by the respective manufacturer for regular, reliable operation. In case the Bidder has to add any other relevant information, the same shall be indicated herein. Continuation sheets of like size and format may be used as per Bidder's requirements.

Sl. No	Description	Quantity	Unit Price	Total Price	Delivery Period	Remarks
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III. SPECIAL TOOLS AND TACKLES

Bidder shall supply the following tools and tackles for operation, maintenance and replacement of equipment and component, supplied under the specification.

Sl.No.	Description	Quantity	Model No./Type	

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IV. LIST OF COMMISSIONING SPARES

Bidder shall tabulate in the proforma below list of all spare parts as recommended by the respective manufacturer for regular, reliable operation. In case the Bidder has to add any other relevant information, the same shall be indicated herein. Continuation sheets of like size and format may be used as per Bidder's requirements.

Sl.No.	Description	Quantity	Unit Price	Total Price	Delivery Period	Remarks
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V. DEVIATION FROM SPECIFICATION

If the proposal submitted has got any deviation from the technical stipulations in the bidding document, the Bidder shall tabulate below the full particulars of such deviations and shall sign below. Additional sheets may be enclosed, if necessary. Deviation is to be furnished with mention of specific clause numbers. Technical and commercial deviations to scope of supply and services, shall be indicated separately.

Sl.No.	CLAUSE NO.	DESCRIPTION AS PER SPECIFICATION	DEVIATION BY BIDDER

We confirm that all the deviations/exceptions to the Job specification and enclosures including reference documents attached are listed in this format only. No other deviations or exceptions even if mentioned elsewhere shall be considered for any technical/ commercial evaluation or for ordering.

Signature of Bidder's
Authorized representative with date.....
Date.....

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VARIANT TABLE					
Sl. No.	Item Type	Dimension	Qty	Material Code	Remarks
1	Mechanical Step type fine Screen with belt conveyor	Channel width = 500mm, SWD = 600mm	1	PY9751281008	1x4.5mld Bhopal STP
2	Manual Bar Fine Screen	Channel width = 500mm, SWD = 600mm	1	PY9751281016	
3	Grit (Detritus) Equipment for STP	Dimensions 2.4m x 2.4m x 1.5m SWD	1	PY9751281024	

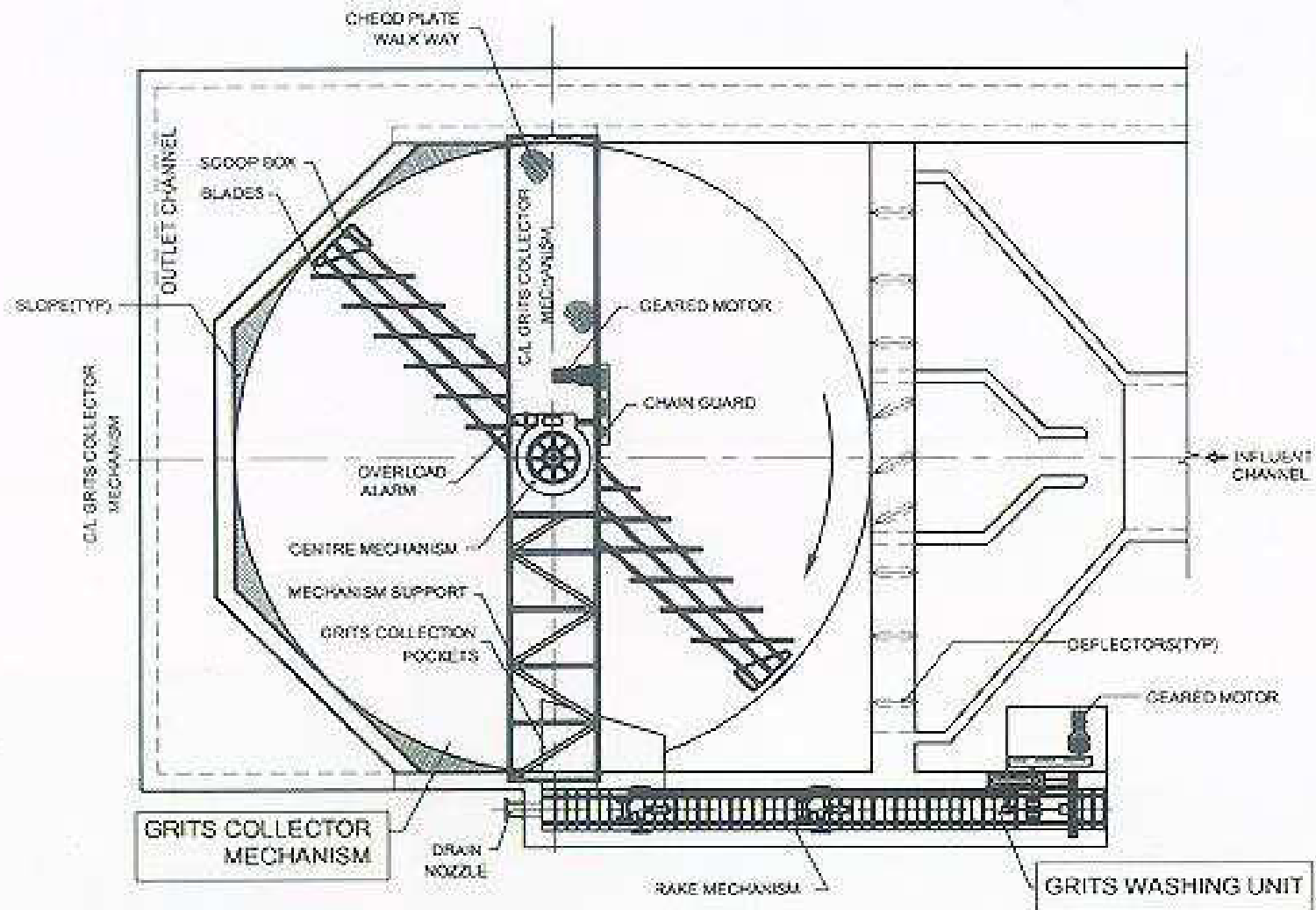
ESP-001 - 2 A Rev. 00		PRODUCT STANDARD BHEL, HYDERABAD – 502032 PROJECT ENGINEERING & SYSTEMS DIVISION	PY 51281	
			Rev. No.	01
			Sheet 16 of 16	

RECORD OF REVISIONS				
Rev. No.	Date	Revision Details	Prepared By	Approved By
00	08.07.17	First Issue	CH.P	MSSN
01	12.07.17	Screens' details deleted and Grit equipment added		

CHECK LIST

Note: Bidder to note that Check List shall be completely filled and the data required in-line with Check List shall be submitted along with their Offer to enable Purchaser to evaluate the offer submitted.

<u>S.No.</u>	<u>Description</u>	Enclosed [Yes/No]	Remarks/ Comments By Bidder
1	Bidder to confirm compliance with PY-AS-04-M096-8436-03 and its annexure without any deviations.		
2	Bidder has already raised pre-bid queries (if any) on Purchase specification.		
3	Bidder Shall submit completely filled following formats indicated in the Purchase Specification PY 51281, Rev00 along with their offer Key Information List of Recommended Spare Parts Special Tools and Tackles Commissioning Spares Deviation from specification		
4	Tentative Electrical Load List is enclosed with offer.		
5	Bidder shall furnish the list of Erection and commissioning spares along with their offer.		
6	Bidder to fill Deviation list (Refer format V of PY 51281). Only those deviation indicated in this list will be considered during technical evaluation of offer. Bidder to indicate the deviations which are impractical to follow.		
7	All other requirements except for the deviation brought out under deviation list, have been taken into consideration.		
8	Bidder has submitted unpriced "Price bid format" with "Quoted" mentioned against price		



TYPICAL GRIT SCHEME DRAWING

TD-201 Rev No. 00	Form No.  HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE Rev No. 00 Page 1 of 3
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. QAP GUIDELINES & FORMAT (ANNEXURE -) The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement. Note : 1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of QAP for BHEL /CUSTOMER approval. 2. No deviation to reference document is acceptable.			

Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE Rev No. 00 Page 2 of 3
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.		<u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u> - QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10. - Each page of QAP shall contain the following information. - Vendor's name & address. - Customer: BHEL, Hyderabad. - Project. - BHEL Product Standard Number/revision number as referred in P.O. - BHEL Purchase Order Number & Date. - Product as per P.O. description. - QAP Number (unique and shall not repeat)/revision number/date. - Page number and number of pages - QAP shall contain four parts / stages as follows. - Raw materials and bought out items. - In process Control / Inspection. - Final assembly, Inspection & Testing. - Painting, preservation & packing. - Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc). - Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT,DP etc.), hydrostatic test, calibration check etc.) - Under 'Class', indicate minor, major or critical depending on the importance of characteristic. - Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.) - Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.) - Under 'Reference document' and 'Acceptance norms', appropriate National & International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review & approval by our Engineering dept. - Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc.	
	Ref. Doc	11. Please refer 'Agency' in QAP format. Under P: Perform, W: Witness, V: Verify Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR 2: (Vendor / Sub vendor)	

Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE
	Rev No. 00		
	Page 3 of 3		
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.	Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where witness points are indicated in specification, P.O., Drawing etc., for such operations, under Witness (W) column use 1. Under 'Verify' column, use code 1. 12. Under 'D' please put (☐ Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification. 13. Vendor's signature & stamp should be available on each page of QAP. 14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification & Approved Drawings. 15. The following operations/characteristics/check points may be included (AS APPROPRIATE) a) Visual check b) Dimensional check c) Mechanical and Chemical properties. d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.) e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc. f) Check for correctness for all components mounted as per General arrangement Drawing, Bill Of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc. g) Verification of test certificate for protection class for the enclosures. h) Mechanical functioning of switches. i) Continuity of earthing and provision of earth points. j) Colour coding of wiring, size, tightness & dressing of wiring. k) Review of test certificates of assembled items, raw materials, internal test reports etc. l) Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc. m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc. n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.) o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non Destructive Tests. p) Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating) q) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole. r) Packing and Preservation. 16. QAP Format enclosed.		
	Ref. Doc		

VENDOR'S NAME & ADDRESS:		MANUFACTURING QUALITY PLAN							QP. NO.:				
		CUSTOMER: BHEL, HYDERABAD – 32.				BHEL P.O.NO.:			REV NO.:		DATE:		
		PROJECT:				P.O.DATE:			PAGE 1 OF 1				
		PRODUCT:				BHEL SPEC: REV:							
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										P	W	V	
1.0	RAW MATERIALS & BOUGHT OUT ITEMS												
2.0	INPROCESS INSPECTION												
3.0	FINAL INSPECTION & TESTING												
4.0	PRESERVATION & PACKING												

VENDOR TO NOTE: THIS FORMAT IS IN MICROSOFT WORD. HEADER & FOOTER SHALL BE AVAILABLE IN EACH PAGE OF QP. QP SHALL BE IN LANDSCAPE & A4 SIZE ONLY. FONT SIZE SHALL BE MIN 10. VENDOR SHALL SIGN & STAMP IN EACH PAGE OF QP. LOI REF. & DATE ARE NOT ACCEPTABLE. P.O.NO. & DATE SHALL BE INDICATED. QP NO. SHOULD BE UNIQUE AND SHALL NOT REPEAT. ALL THE TESTS / CHECKS INDICATED IN THE BHEL SPEC. SHALL BE INDICATED IN THE QP.

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY	APPROVED BY	APPROVED BY
	VENDOR'S SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'S SIGNATURE & STAMP

ANNEXURE-4 - to Job Specification for Grit Equipment PY-AS-04-M096-8436-03**MASTER DOCUMENT LIST FOR GRIT EQUIPMENT - 1X4.5 MLD BHOPAL STP**

S.No.	Drg./ Doc. Name	BHEL Document Number	Category	Status	Scheduled date	
						RD
1	EQUIPMENT LAYOUT OF GRIT MECHANISM					
2	GA DRAWING OF GRIT SCRAPER WITH BRIDGE					
3	GA DRAWING OF GRIT CLASSIFIER					
4	GA of ORGANIC RETURN PUMP					
5	DATA SHEET OF GRIT MECHANISM INCLUDING SCRAPER, CLASSIFIER AND RETURN PUMP					
6	HEAD LOSS CALCULATION					
7	ELECTRICAL LOAD LIST					
8	LIST OF RECOMMENDED SPARES					