



1 X 250 MW NSPCL Rourkela PP-II Expansion Project
 Rourkela, Odisha

**Technical Enquiry Specification for
 Cast Basalt Lined Bends & Fittings-Lot2
 For Ash Handling System**



**BHARAT HEAVY ELECTRICALS LIMITED
 INDUSTRIAL SYSTEMS GROUP
 BANGALORE**

	Prepared By	Checked by	Approved by
MECHANICAL	S Ragavan	S Ragavan	Amit Gupta

TABLE OF CONTENTS

Contents:

1.1	PROJECT INFORMATION:.....	3
1.2	SCOPE OF SUPPLY:.....	3
1.3	SPECIFICATIONS FOR CAST BASALT LINED BENDS & FITTINGS:	3
1.4	BEND/FITTING CONSTRUCTION:.....	4
1.5	FLANGE	4
1.6	PROPERTIES OF CAST BASALT:.....	4
1.7	NUTS & BOLTS, WASHER AND GASKETS:	4
1.8	PAINTING:	4
2.0	INSPECTIONS & TESTING:	5
3.0	TECHNICAL INPUTS TO BE FURNISHED/CONFIRMED ALONG WITH THE OFFER:.....	5
4.0	LIST OF DRG/DOC TO BE FURNISHED AFTER PLACEMENT OF LOI:.....	5

Enclosures:-

1. TYPICAL GA OF BENDS, T-PIECE

1.1 Project Information:

The specification has been prepared for supply of **CAST BASALT LINED BENDS & FITTINGS-LOT2** for 1 x 250 MW NSPCL Rourkela PP-II expansion project for which MECON Ltd., Ranchi, is the consultant for the customer NSPCL. BHEL is the principal contractor who is responsible for the establishment of the power project for 1 x 250 MW NSPCL Rourkela PP-II expansion project. Industrial Systems Group (ISG) of BHEL located at Bengaluru will be executing the Ash handling system. Project Site is located Rourkela in Sundergarh district of Odisha state. Basic wind speed is 39 m/sec & Seismic zone-2.

Plant location: The proposed unit of 1x250 MW will be installed on the western side of existing 2x60 MW units within the boundary of Rourkela Steel Plant in Sundergarh district of Orissa.

Site data:

Latitude/Longitude	22°13'19" N/ 84°53'51" E
Average elevation above Mean Sea Level	230 m
Maximum Ambient temperature (Extreme High)	48° C
Minimum monthly temperature (Extreme low)	6° C
Relative Humidity	65%
Maximum Wind speed	39 m/s
Annual Average Rainfall	1460.9 mm
Seismic zone	Zone-II (As per latest Revision of IS 1893 /2002) Part-I

1.2 Scope of Supply:

The scope of supply and works includes **design, engineering, manufacture, supply, hydro testing at shop, inspection at manufacturer's work, painting, delivery at site** of cast basalt lined bends / fittings, companion flanges & required nuts, bolts, washers & gaskets for fastening the bends & fittings to ash slurry disposal pipe for ash slurry disposal system. The manufacturer shall make their own arrangement for testing of cast basalt lined bends & fittings at shop floor and inspection & testing by BHEL/ Customer/ Customer's Consultant/ Third party inspector at manufacturer's work whatever tests/ checks needed to be done according to approved QAP which shall be submitted by bidder during the course of tender to take approval from the customer.

1.3 Specifications for Cast Basalt Lined Bends & Fittings:

The cast basalt lined bends & fittings shall be according to the specifications given as follows:

Size & quantity of bends & fittings with flanges–

S. No.	Item	Size (NB)	Angle (Deg.)	Radius of Bend/Fitting	Quantity (Nos)	Ref Drg No
1	Bends	300	0° to 30° bends	3D	6	IS-3-GA-708-305-CB01_Rev 01
2		300	61° to 90° bends	3D	14	
4	T-Piece	300	NA	NA	3	IS-3-GA-708-305-CB02_Rev 00
6	Special bends	300	NA	3D	3	IS-3-GA-708-305-CBS02_Rev 00

*We have attached the GA of Ash Slurry Pump House drawing also for reference.

Note – In case of any additional requirement of bends, bidder shall supply the same as follows:

0° to 30° bends – At the rate quoted for 30° bends.

61° to 90° bends – At the rate quoted for 90°bends.

The exact sizes of bends shall be provided after award of contract to the successful bidder.

1.4 Bend/Fitting Construction:

The casing of fitting shall of mild steel (MS) as per IS 2062 GR-A of min 6 mm thickness with 20±2mm thick cast basalt lining to suit 300 NB MS ERW pipes as per IS 3589 with thickness 9.52 mm with ID 303 mm. Bend/fitting shall be flanged with required nuts & bolts & washers and gaskets to fasten it to 300 NB MS ERW pipes (as per IS3589 with thickness 9.52 mm with ID 303 mm) & joint to be enough efficient. Radius of bend/ fitting shall be approx. three (03) times the internal diameter of 300 NB pipe (MSERW as per IS3589 with thickness 9.52 mm with internal diameter 303 mm). Cast Basalt Bends/ Fittings shall be as per typical drawing attached to this technical enquiry specification.

1.5 Flange

Flanges to both the sides of bend/ fitting shall be slip on flat face type with drilled & other specialties shall be as per IS: IS 2062. Minimum thickness of flange shall be 38 mm.

S. No.	Description	Quantity	Drawing Number
1.	Companion Flange	55	IS-3-GA-708-305-CB05_Rev 00

1.6 Properties of Cast Basalt:

S. No.	Description	Technical Particulars
1.	Hardness	8mhos. (min.) or 450 BHN
2.	Bending Strength	300kg/cm ² (min.)
3.	Compressive Strength	4500kg/cm ² (min.)
4.	Density	2.8-3.1 gm/cm ³

1.7 Nuts & Bolts, Washer and Gaskets:

Nuts & bolts shall be as per IS 1367 or ASTM A-307 Gr. B (galvanized as per IS 4759). Washer shall be as per IS 2016 (Galvanized as per IS 4759). Gaskets shall be of neoprene rubber (asbestos free material-wire inserted red rubber) with minimum thickness of 5 mm. Nuts & bolts shall be of high tensile steel.

1.8 Painting:

Painting requirements given below shall be strictly followed by bidder for painting of cast basalt lined bends/ fittings before dispatch:

1.	Surface Preparation	Surface which is to be painted shall be cleaned of dust and grease and the heavier layers of rust shall be removed by chipping prior to actual surface preparation. The surface shall be cleaned to grade Sa-2 1/2 as per IS: 1477 part-1.			
2.	Painting Stages	Type of Paint	No of coats	Min DFT (µm)	
				Per coat	Total
	Primer	Epoxy polyamide resin based red oxide –zinc phosphate	2	30	60
	Intermediate	Two pack air drying high build epoxy resin based paint with MIO	1	80	80
	Finish Paint	Two pack air drying epoxy polyamide enamel	2	30	60
3.	Total Min. DFT	200 µm			
4.	Color Code	Grey ; Shade No- RAL 9002			

2.0 Inspections & Testing:

1. NTPC approved QAP of previous project shall be followed for inspection of bends and fittings.
2. The customer/ Inspector, unless the witnessing of the tests is virtually waived, will attend such tests within 15 days of the date on which the equipment is notified as being ready.
3. Type & routine test report/ certificates shall include details of standard to which the tests are performed, test parameters, acceptance criteria, test set up etc. used during the testing along with the test piece details/ rating and the detailed test record and final test result.
4. All inspection, measuring and test equipment used by the contractor shall be calibrated periodically. Bidder shall maintain all relevant records of periodic calibration, instrument identification, and shall provide for inspection by bidder wherever asked specifically; bidder shall calibrate measuring / testing equipment in the presence of employer.
5. Vendor shall maintain strict quality norms and standards for Bought out/self-manufactured items through quality departments who carryout stage and final inspection of the product as per quality standards agreed by engineering/quality specialists.
6. After completion of inspection the material will be treated as ready for dispatch if inspection is OK as observed by Inspection Engineers. However, formal clearance will be issued by BHEL-ISG Bangalore.

3.0 Technical inputs to be furnished/confirmed along with the offer:

Following documents are to be necessarily enclosed by the bidder as a part of the offer:

- a) GA drawings of bends/ fittings
- b) **Bidder shall submit duly signed copy by bidder's authorized signatory of this technical enquiry specification along with all attachments/ enclosures.**

4.0 LIST OF DRG/DOC TO BE FURNISHED AFTER PLACEMENT OF LOI:

Bidder shall have to furnish the following drg/docs within 10 days after placement of LOI to bidder:

- a. GA drawing of all bends/fittings complete With Bill of Material & technical details of bend fittings for approval.
- b. QAP of Bends and Fittings
- c. Any other relevant document which may be felt necessary during execution of Contract.
- d. Successful bidder shall submit all the above with proper title block within a week of receipt of LOI. Bidder's LD on account of delay on submission and revised submission of these documents/drawings shall not be entertained.
- e. The approval time for Drawings/Documents from BHEL/Customer shall be considered by bidder as three weeks for their planning of supply of equipment within time frame.