भारत हेवी इलेक्ट्रिकल्स लिमिटेड
(भारत सरकार का उपक्रम)
BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)

**TCN – 03**

Ref: PSER:SCT:BRM:M1308:TCN-03 Date: 17-03-2012

| | | |
|---|---|---|
| Sub | Tender Change Notice (TCN)- 03 | |
| Job | Design, engineering, manufacturing, supply, Testing, commissioning etc of CWPH EOT Crane for 2x250 MW BARAUNI Extension Project unit # 8 & 9 at BEGUSARAI, BIHAR. | |
| Ref | 1.0 | Tender no PSER:SCT:BRM:M1308:12. |
| | 2.0 | BHEL's NIT, vide reference no PSER:SCT:BRM:M1308:2715, Date: 21-02-2012. |
| | 3.0 | BHEL's TCN-01 vide ref. no. PSER:SCT:BRM-M1308:TCN-01 dated 23/02/2012. |
| | 4.0 | BHEL's TCN-02 vide ref. no. PSER:SCT:BRM-M1308:TCN-02 dated 13/03/2012. |
| | 5.0 | Other References, if any. |

With reference to above, following points, relevant to tender, may please be noted and complied with while submitting the offer.

1.0 Introduction of technical spec. (PE-TS-374-501-A002 ) as attached herewith.

2.0 Revised `No deviation certificate' is attached. Bidder to submit `No deviation certificate' as per attached format only.

3.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

ENGINEER (SCT)

Encl:
1.0 As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)
POWER SECTOR EASTERN REGION, DJ-9/1, SALT LAKE CITY, KOLKATA - 700 091
फैक्स/Fax : (033) 23211960 फोन/Phone : बोर्ड/EPABX : 23211798/ 1691

**ANNEXURE - 2**

**FORMAT FOR NO DEVIATION CERTIFICATE**
**(To be submitted in the bidder's letter head)**

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

| | | |
|---|---|---|
| Sub | No Deviation Certificate. | |
| Job | Design, engineering, manufacturing, supply, Testing, commissioning etc of CWPH EOT Crane for 2x250 MW BARAUNI Extension Project unit # 8 & 9 at BEGUSARAI, BIHAR. | |
| Ref | 1.0 | Tender no PSER:SCT:BRM-M1308:12 |
| | 2.0 | BHEL's NIT, vide ref no: PSER:SCT:BRM-M1308:2715, dated 21/02/2012. |
| | 3.0 | BHEL's TCN-01 vide ref. no. PSER:SCT:BRM-M1308:TCN-01, dated 23/02/2012. |
| | 4.0 | BHEL's TCN-02 vide ref. no. PSER:SCT:BRM:M1308:TCN-02, dated 13-03-2012. |
| | 5.0 | BHEL's TCN-03 vide ref. no. PSER:SCT:BRM:M1308:TCN-03, dated 17-03-2012. |
| | 6.0 | Other References, if any. |

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, Integrity Pact (If applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

# BIHAR STATE ELECTRICITY BOARD

## 2 X 250 MW BSEB, BARAUNI TPP

# PROJECT SPECIFIC
# TECHNICAL SPECIFICATION FOR CW PUMP HOUSE (DOUBLE GIRDER) EOT CRANE

## SPECIFICATION NO.: PE-TS-374-501-A002

**BHARAT HEAVY ELECTRICALS LTD**
**POWER SECTOR PROJECT ENGINEERING MANAGEMENT**
**NOIDA**
**INDIA**

**INDEX**



*Note:*

*1.0 The standard technical specification PE-TS-STD-501-A-002 Rev.03 shall be applicable for this project.*

# Project Information
# 2x250 MW Barauni Unit# 8 &9

## 1.0.0 PROJECT INFORMATION

| | | |
|---|---|---|
| 1. | Owner | Bihar Electricity Board (BSEB). |
| 2. | Project | 2 X 250 MW Unit # 8 & 9, Barauni-TPS, Begusarai |
| 3. | Owner's consultant | M/s Evonik, Sec-16, Noida |
| 4. | Location | Town: Barauni, District: Begusarai, State: Bihar |
| 5. | Site | Existing ash dyke are of about 340 acres |
| 6. | FFL/FGL | FFL EL+/- 0.0 corresponds to **RL 45.50 M** above MSL<br>FGL corresponds to **RL 45.00 M** above MSL |
| 7. | Nearest Airport | Patna-115 Kms. |
| 8. | Nearest Rail Head | Simaria Railway Station on North Eastern railways |
| 9. | Access to site | The site is at Barauni-Mokama section of National Highway (NH-31) |
| 10. | Metrological data | (Refer as under) |

## Site Meteorological Data:

| S.NO. | DESCRIPTION | DATA |
|---|---|---|
| A | Latitude | N $25^0$23'13.5" to N $25^0$23'54" |
| B | Longitude | E $86^0$01'05.1" to E $86^0$01'46.3" |
| 1. | Maximum Ambient Air Temperature | 35.2° C |
| 2. | Minimum Ambient Air Temperature | 11.4°C |
| | Dry Bulb Temperatures | |
| | Highest recorded : | 35.3°.C |
| | Lowest recorded : | 12.1° C |
| | Wet Bulb Temperatures | |
| 1. | Design AMB WBT | Minimum – 12.0°.C<br>Maximum- 29.0°.C |
| C | RELATIVE HUMIDITY | |
| | Design AMB WBT | Minimum- 26%<br>Maximum- 98% |
| | Annual Mean | 52 % |
| D | RAINFALL | |
| 1. | Annual Total | 1003.4 mm |
| E | WIND DATA | |
| 1. | Wind Speed | 47 m/sec |
| 2. | Prevailing Wind Direction | East (blowing from) |
| 3. | Wind Pressure | Minimum 990 hPa.<br>Maximum 1011.5 hPa. |
| F | SEISMIC COEFFICIENT | Zone IV as per IS-1893 Part-I (2002) |

| | SPECIFIC CONFIRMATION / COMMENTS REQUIRED FROM BIDDER | |
|---|---|---|
| | **TITLE: Double Girder EOT Cranes up to 50T capacity (For CW PUMP HOUSE)** | **SPECIFICATION: PE-TS-374-501-A001**<br>**VOLUME-II B SECTION-C REVISION:00** |
| | **PROJECT: 2 X 250 MW BSEB, BARAUNI TPP** | **DATE: JANUARY 2012 No. of SHEETS: 3** |
| | | |
| S.N. | DESCRIPTION | REPLY / COMMENTS BY BIDDER |
| 1.00 | MECHANICAL | |
| 1.01 | Bidder to confirm that the **Data sheet -A / B attached along with Project Specific Technical Specification PE-TS-374-501-A001** are acceptable without any deviation. **Bidder to confirm the same.** | CONFIRMED / NOT CONFIRMED |
| 1.02 | In case of any deviation from Project Specific Technical Specification (PE-TS-374-501-A002 Rev. 0)and Standard Technical Specification (PE-TS-STD-501-A002 Rev. 03), the same has been furnished in the separate Deviation schedule attached along with Standard Technical Specification. Bidder to note that deviation mentioned elsewhere will not be taken cognizance of in any case. **Bidder to confirm the same.** | CONFIRMED / NOT CONFIRMED |
| 1.03 | Bidder to confirm that there is no deviation from the QAP attached along with the Standard Technical Specification (PE-TS-STD-501-A002 Rev. 03) . Further, QAP for cranes is subject to customer approval during contract execution stage. In case of any additional test required to be carried out on any of the crane component, if commented by customer, will have to be complied by bidder without any commercial implication. **Bidder to confirm** | CONFIRMED / NOT CONFIRMED |
| 1.04 | Bidder to confirm that there is no deviation from the Crane Clearance Diagram for TG Hall EOT Crane (PE- DG -374-501-A002 Rev 00) attached with the Project Specific Technical Specification (PE-TS-374-501-A001). **Bidder to specifically note that in no case any deviation from the Crane Clearance diagrams given by BHEL shall be accepted. Bidder to confirm the same.** | CONFIRMED / NOT CONFIRMED |

| | | |
|---|---|---|
| 1.05 | Bidder to confirm that there is no deviation from the makes of various sub vendors items as given in annexure-I “Makes of Sub-vendors Items” , volume II-B, section-C of Standard Technical Specification (PE-TS-STD-501-A001 Rev. 03). **Bidder shall confirm the compliance** | CONFIRMED / NOT CONFIRMED |
| 1.06 | The material offered is equal or better in grade than specified. **Bidder shall confirm the compliance** | CONFIRMED / NOT CONFIRMED |
| 1.07 | Bidder to note and confirm that there will be no price implication for variation in Span, Lift and Baylength upto ± 500 mm. **Bidder to confirm** | CONFIRMED / NOT CONFIRMED |
| 1.08 | Bush as a antifriction bearing shall not be used. **Bidder shall confirm the compliance** | CONFIRMED / NOT CONFIRMED |
| 1.09 | **Bidder to confirm** the compliance to the Painting Specification (for plains) and Color Coding Procedure attached in the standard technical specification no. PE-TS-STD-501-A001 (Rev. 03) - Annexure IVA of Section C Vol IIB | CONFIRMED / NOT CONFIRMED |
| 1.10 | Bidder to confirm that in case of award of order, **Hook drawing** shall be submitted to BHEL within one week of receiving the LOI. Bidder also to submit Unpriced Purchase Order copy of Hook within 15 days from LOI . **Bidder to confirm** | CONFIRMED / NOT CONFIRMED |
| 1.11 | Bidder to confirm that in case of award of order, Motor Sizing calculations shall be submitted within 15 days time of receiving the LOI by the bidder. **Bidder to confirm the same.** | CONFIRMED / NOT CONFIRMED |
| | | |
| **2.00** | **ELECTRICALS** | |
| **2.01** | **CABLES** | |
| a | All CONTROL AND POWER cables shall be as per BHEL specification. **Bidder shall confirm the compliance** | CONFIRMED / NOT CONFIRMED |
| b | Cable required between isolating switch / change over switch and DSL included in the scope. **Bidder to confirm the same.** | CONFIRMED / NOT CONFIRMED |
| **2.02** | **MOTORS** | |

| | | |
|---|---|---|
| a | Class of insulation of Sq. cage motors shall be "F" and the temperature rise to limited to class "B". **Bidder shall confirm the compliance** | CONFIRMED / NOT CONFIRMED |
| b | Motor size shall be subjected to the approval of motor calculation. **Bidder shall confirm the compliance** | CONFIRMED / NOT CONFIRMED |
| c | The successful bidder shall submit the data sheet -C of LV motors and power & control cables during detailed engineering and the same is subjected to customer approval without any cost implication on account of the same. **Bidder shall confirm the compliance** | CONFIRMED / NOT CONFIRMED |
| d | Bidder to confirm that there is no technical deviation on "Electrical portion of Technical specification" and "Data sheet of Electrical portion". **Bidder to confirm the same.** | CONFIRMED / NOT CONFIRMED |
| | | |

# DATA SHEET FOR CWPH EOT CRANE WITH VVVF DRIVES

*** Information's are to be furnished by bidder during contract stage**

| Sr. No. | | DESCRIPTION | TECHNICAL PARTICULARS |
|---|---|---|---|
| **1.0.0** | | **General** | |
| **1.1.0** | | **Name of manufacturer** | * |
| | a. | EOT Crane | * |
| | b. | Crane motors | * |
| | c. | Runway conductors | * |
| **1.2.0** | | **Weight of equipments** | |
| | a. | Bridge assembly | * |
| | b. | Trolley assembly | * |
| | c. | Total crane weight | * |
| | d. | Total weight of the gantry rail | * |
| | e. | Total weight of DSL | * |
| | f. | Total weight of all the equipments under this specification | * |
| **1.3.0** | | **Design, fabrication and testing of the crane confirm to standard / code number** | IS: 3177-1999 |
| **1.4.0** | | **Number of cranes** | One(1) |
| **1.5.0** | | **Crane classification** | M5 duty |
| **1.6.0** | | **Suitable for outdoor or indoor duty** | Indoor |
| **1.7.0** | | **Capacity and lift** | |
| **1.7.1** | | **Main hoist** | |
| | a. | Rated SWC – tonnes | 25T |
| | b. | Test load SWC – tonnes | Rated SWC and over load test : 125% of SWC |
| **1.7.2** | | **Aux. hoists** | **---------NA---------** |
| | a. | Rated SWC – tonnes | **---------NA---------** |

| | | | | |
|---|---|---|---|---|
| | b. | Test load SWC – tonnes | **---------NA---------** | |
| **1.8.0** | | **Span** | **As per crane clearance diagram** | |
| **1.9.0** | | **Operation from** | Pendent Push Button | |
| **2.00** | | **CRANE PERFORMANCE** | | |
| **2.1.0** | | Crane speed with full load | Full speed M/Min | Creep speed M/Min |
| | a. | Main hoist | 1.6 | 10% of main speed ( thru' VVVF drives) |
| | b. | Aux. hoist | ---------NA--------- | ---------NA--------- |
| | c. | Trolley travel (CT) | 15.0 | 10% of main speed ( thru' VVVF drives) |
| | d. | Longitudinal bridge travel (LT) | 30.0 | 10% of main speed ( thru' VVVF drives) |
| **2.2.0** | | Acceleration values | LT motion (bridge travel) | CT motion (trolley travel) |
| | | | As per IS: 3177 | As per IS: 3177 |
| **2.3.0** | | **Lift in Metres** | The lifting rope shall be of sufficient length to permit the hook to reach the zero level. | |
| | a. | Main Hoist | **As per Crane clearance diagram** | |
| | b. | Aux Hoist | **---------NA---------** | |
| **2.4.0** | | Hook Approaches | | |
| | a. | Main hook (cabin end) | **As per Crane clearance diagram** | |
| | b. | Aux. Hook (cabin-end) | **---------NA---------** | |
| | c. | Main hook (other end) | **As per Crane clearance diagram** | |
| | d. | Aux. Hook (other end) | **---------NA---------** | |
| **2.5.0** | | **Hand Rail Pipes** | 32 mm NB Medium class of IS: 1161 having top and bottom rail at height of 1050 mm and 600 mm and vertical post spacing not exceeding 1500 mm with provision of kick plate (100 mm high and 6mm thick) | |
| **3.0.0** | | **COMPONENT DETAILS** | | |
| **3.1.0** | | **Trolley** | | |
| | a. | Type | Fabricated | |
| | b. | Method of fabrication | Fusion welded | |
| | c. | Material | IS: 2062 Gr. A up to 20mm thickness, Grade B Normalized for thickness above 20mm. High steel alloy steel confirming to IS: 8500 is also acceptable. | |

| | | | | |
|---|---|---|---|---|
| | d. | Centre to centre distance of wheels (on the same rails) | * | |
| | e. | Whether jacking pads for lifting trolley provided or not | Yes | |
| **3.2.0** | | **Rope drums** | **Main hoist** | **Aux. Hoist ---------NA--------** |
| | a. | Dimensions in mm length and diameter (PCD) | * | |
| | b. | Material (Indicate IS) | Seamless pipe ASTM -106 or fabricated Fe410w IS: 2062 & stress relieved | |
| | c. | Flange / flangeless | Flanged | |
| | d. | Numbers provided | One for each hoist | |
| | e. | Number of grooves | * | |
| | f. | Type of grooves | Identical Right hand and Left hand | |
| | g. | Diameter on bottom of grooves | During detailed engineering | |
| **3.3.0** | | **Rope details** | | |
| | a. | Construction | Extra flexible plough steel , 6 x 36 / 6 x 37 construction | |
| | b. | Grade | During detailed engineering | |
| | c. | Standard conforming to | IS: 2266 | |
| | d. | Diameter in mm | * | |
| | e. | Breaking strength | * | |
| | f. | Tensile designation | * | |
| | g. | Factor of safety | 5.25 as per IS | |
| | h. | Type of core | Fibre | |
| | i. | Number of falls | * | |
| | j | Length of rope | * | |
| **3.4.0** | | **Sheaves details** | **Main hoist** | **Aux. Hoist ---------NA--------** |
| | a. | Material | Fe 410 WA IS: 2062 Gr. A or B/ CS Gr. 280-520 IS: 1030 | |
| | b. | Diameter of main sheaves in mm on Root | * | |
| | c. | Diameter of Equalizing sheaves (in mm) on Root | Should not be less 62% of calculated main sheave diameter | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | d. | Type of guards provided | Fabricated from Sheet steel | | | |
| **3.5.0** | | **COUPLINGS & SHAFTING** | | | | |
| **3.5.1** | | Coupling details (between motor and gear box) | Main hoist | Aux. Hoist **-----NA------** | Cross Travel | Long Travel |
| | a. | Type | Flexible geared Type | | | |
| | b. | Size & Torque rating | * | | | |
| | c. | Guards and enclosures | Provided | | | |
| **3.5.2** | | Coupling details (between gear box and wheels) | Cross Travel (CT) | | Long Travel (LT) | |
| | a. | Type | Flexible geared type | | | |
| | b. | Size & Torque rating | * | | | |
| | c. | Guards and enclosures provided | Yes | | | |
| **3.5.3** | | Coupling details (between gear box and rope drum) | Main hoist | | Aux. Hoist **---------NA---------** | |
| | a. | Type | Flexible Built-in gear couplings | | | |
| | b. | Size | * | | | |
| | c. | Guards and enclosures provided | Yes | | | |
| **3.5.4** | | **Shafting (Output)** | **Cross Travel** | | **Long Travel** | |
| | a. | Diameter in mm | * | | * | |
| | b. | Factor of Safety | As per IS: 3177-1999 | | | |
| | c. | Number of support bearings | * | | * | |
| | d. | Type of support bearing | * | | * | |
| | e. | Arrangement of lubrication | Grease cups / Nipple | | | |
| | f. | Type of lubricant | Grease | | | |
| | g. | Max unsupported length of shaft in mm | * | | * | |
| **3.6.0** | | **Gear box details** | | | | |
| **3.6.1** | | Hoist Motions | **MH** | **MH Micro** | **AH** | **AH micro** |
| | a. | Type of mounting of gear box | Horizontal / Vertical | | **---------NA---------** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | b. | Classification | Suitable for M5 duty | | | |
| | c. | Total number of reductions | * | NA | ---------NA--------- | |
| | d. | Type of gears | Helical | NA | | |
| | e. | Reduction ratio | * | | | |
| | f. | Type of lubrication (grease / splash / pump lubrication) | Splash Lubrication | | | |
| | g. | Hardness (BHN) – gear | * | | | |
| | h. | Hardness (BHN) – pinion | * | | | |
| | i. | Difference in Gear and pinion hardness | Min 20 BHN | | | |
| | j. | Materials (gear/pinions) | Main Gears En 9/ 55C8/ IS2707 Gr. 1 or 2 Pinions En 19/ EN 24. Hardness conforming to IS: 3177 | | | |
| | k. | Castings | Fabricated Fe 410w IS: 2062 & stress relieved | | | |
| | l. | Noise level | 85 db | NA | | |
| | m. | Standard conforming to | IS: 4460 / AGMA | | | |
| **3.6.2** | | **Travel Motions** | **CT** | **CT micro** | **LT** | **LT micro** |
| | a. | Type of mounting gear box | Vertical | | | |
| | b. | Classification | M5 duty | | | |
| | c. | Total number of reduction | * | NA | * | NA |
| | d. | Type of gears | Helical | NA | Helical | NA |
| | e. | Reduction ratio | * | NA | * | NA |
| | f. | Type of lubrication (grease / splash / pump lubrication) | Splash Lubrication | | | |
| | g. | Hardness (BHN) – gear | * | | | |
| | h. | Hardness (BHN) – pinion | * | | | |
| | i. | Difference in Gear and pinion hardness | Min 20 BHN | | | |
| | j. | Materials (gear / pinions) | Main Gears En 9/ 55C8/ IS2707 Gr. 1 or 2 Pinions En 19/ EN 24. Hardness conforming to IS: 3177 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | k. | Castings | Fabricated Fe 410w IS: 2062 & stress relieved | | | |
| | l. | Standard conforming to | IS: 4460 / AGMA | | | |
| **3.7.0** | | **Wheels details** | **Cross travel** | | **Long travel** | |
| | a. | Material | C 55 Mn 75 / EN 9 (55 C 8) | | | |
| | b. | Hardness | 300 – 350 BHN | | | |
| | c. | Depth of hardness | 10 mm (min) | | | |
| | d. | Tread diameter in mm | * | | * | |
| | e. | Tread width in mm | * | | * | |
| | f. | Process of hardening | Volume hardening | | | |
| | g. | Type | Double flanged straight tread | | | |
| | h. | Numbers provided | 4 nos. | | 4 nos. | |
| | i. | Specification conforming to | IS: 3177 | | | |
| | j | Arrangement of lubrication | Grease | | | |
| **3.8.0** | | **Lifting hooks** | **MH** | | **AH** | |
| | a. | Type | 'C' type with plain shank | | **---------NA---------** | |
| | b. | Safe lifting capacity | 25 T | | | |
| | c. | Material | EN 3A-BS 970 Class 2 IS: 1875 | | | |
| | d. | Standard conforming to | IS 15560 | | | |
| | e. | Hook can rotate | Yes | | | |
| | f. | Safety latch on hook provided | Yes | | | |
| | g. | Locking device on swivelling hook required or not | Provided | | | |
| **3.9.0** | | **Buffers** | **Cross travel** | | **Long travel** | |
| | a. | Type | Spring loaded type. To be designed to bring the loaded crane to rest from speed of 50% of the rated speed. | | | |
| | b. | Numbers provided | 4 | | 4 | |
| | c. | Details of end stop | Fabricated Fe 410w IS: 2062 | | | |
| **3.10.0** | | **Brakes** | | | | |
| **3.10.1** | | **Hoist Motions** | **MH** | **MH micro** | **AH --NA--** | **AH micro --NA--** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | a | Type of brake (ac / dc / thruster) | AC Electro-Hydraulic Thruster operated + DCEM | | | |
| | b. | Diameter of brake in mm | * | NA | ---------NA--------- | |
| | c. | Torque rating Kg. M | * | | | |
| | d. | Number provided per motor | 1+1 | | | |
| | e. | Braking capacity | 150% | | | |
| | f. | Braking torque actually required | * | | | |
| | g. | Material | | | | |
| | | • Brake liners | Ferrodo liners | NA | | |
| | | • Drum | CS IS : 1030 / CL 4 IS : 1875 | | | |
| | | • Springs | As per manufacturers standard | | | |
| | h. | Braking distance in mm | * | | | |
| **3.10.2** | | **Travel Motions** | **CT** | **CT micro** | **LT** | **LT micro** |
| | a. | Type of brake (ac / dc / thrustor) | AC Electro-Hydraulic Thruster operated | | | |
| | b. | Dia of brake in mm | * | NA | * | NA |
| | c. | Torque rating Kg.M | * | | * | |
| | d. | Number provided / motor | 1 | | 1 | |
| | e. | Braking capacity | 125% | | 125% | |
| | f. | Braking torque actually required | * | | * | |
| | g. | Material | | | | |
| | | • Brake liners | Ferrodo liners | | | |
| | | • Drum | CS IS : 1030 / CL4 IS : 1875 | | | |
| | | • Springs | As per manufacturers standard | | | |
| | | • Thrusters | * | | | |
| | h. | Braking distance in mm | * | NA | * | NA |
| **3.11.0** | | **Drive system for hoisting** | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | a. | Arrangement of drive from motor to rope drum (main) | Through geared coupling and gear box | | | | |
| | b. | Arrangement of drive from pony motor to rope drum (creep speed) | NA | | | | |
| **3.12.0** | | **Bearings** | **Crane hook** | **Trolley wheels** | **Rope drum** | **Gear box** | **Any other assembly** |
| | a. | Type | Antifriction ball / roller bearings | | | | |
| | b. | Number provided for each | As per assembly requirements | | | | |
| | c. | Method of lubrication | Grease lubrication | | | | |
| | d | Bearing life | 10,000 working hours. | | | | |
| **3.13.0** | | **Bridge girder** | | | | | |
| | a. | Type & Quantity | Box type – 2 nos. Material: IS 2062 Gr. A / B | | | | |
| | b. | Size | * | | | | |
| | c. | Vertical Deflection | Span / 900 | | | | |
| | d. | Type of connection to end carriage | By fitted bolts | | | | |
| | e. | Width | * | | | | |
| | f. | Length | * | | | | |
| **3.14.0** | | **Rails** | | | | | |
| | a. | Type / section | Rails sections as per IS: 3443 Grade 50 C 12. Joint to be butt-welded by thermit welding & fusion welding or by end clamping arrangement. | | | | |
| | b. | Standard conforming to | IS: 3443 | | | | |
| | c. | Weight per metre | * | | | | |
| | d. | Material | Rail Steel | | | | |
| | e. | Top width in mm | * | | | | |
| | f. | Height in mm | * | | | | |
| **3.15.0** | | **Type of platform required on the bridge** | Chequered plate platform 6mm thick as per IS : 3502 | | | | |
| | a. | Position of access point | From LT walkway | | | | |
| | b. | Emergency escape | Rung Ladder at ends | | | | |
| | c | Length | Full span length | | | | |
| | d | Provided on both side | Yes | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | e. | Width of platform | Min. 750mm clear space from electrical panels / equipments from the trolley on panel side and Min. 750 mm on drive end side | | | |
| **3.16.0** | | **End carriage span (wheel base)** | As per IS 807 (latest edition) | | | |
| **3.17.0** | | **Motors** | | | | |
| **3.17.1** | | **Hoist Motions** | **MH** | **MH micro** | **AH** | **AH micro** |
| | a. | Type | SC, suitable for Inverter duty | NA | ----NA--- | |
| | b. | Enclosure | TEFC | NA | | |
| | c. | Numbers furnished | One per motion | | | |
| | d. | Voltage, phase and frequency | 415V ± 10%, 3 Ph, 50 Hz ± 5%<br>Combined voltage & frequency variation= 10% absolute | | | |
| | e. | Class of protection | IP – 55 | | | |
| | f. | Rated capacity (KW) | Selected motor rating should have minimum margin of 15% over maximum continuous load demand including voltage and frequency variation, temperature rise and other factor. Motor nameplate rating at 50 $^{o}$C shall have at least 15% margin over the input power requirement of driven equipment at rated duty point. | | | |
| | g. | Duration factor/duty | 40 % CDF / S-4 | | | |
| | h. | Speed (rpm) | * | | | |
| | i. | Class of insulation | Class ‘F’ for sq. cage motors with temp rise limited to that of class B | | | |
| | j. | Number of starts/ hour | 150 starts / hr | | | |
| | k. | Contactors for motor | * | | | |
| | l. | Overload protection for motors provided | Yes | | | |
| | m | Space heater requirements | For motors of rating 30 KW and above | | | |
| **3.17.2** | | **Travel Motions** | **CT** | **CT micro** | **LT** | **LT micro** |
| | a. | Type | SC, suitable for Inverter duty | NA | SC, suitable for Inverter duty | NA |
| | b. | Enclosure | TEFC | NA | TEFC | NA |
| | c. | Numbers furnished | One per motion | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | d. | Voltage, phase and frequency | 415V ± 10%, 3 Ph, 50 Hz ± 5%<br>Combined voltage & frequency variation = 10% absolute | | | |
| | e. | Class of protection | IP – 54 | | | |
| | f. | Rated capacity (KW) | Selected motor rating should have minimum margin of 15% over maximum continuous load demand including voltage and frequency variation, temperature rise and other factor. Motor nameplate rating at 50 $^{o}$C shall have at least 15% margin over the input power requirement of driven equipment at rated duty point. | | | |
| | g. | Duration factor/duty | 40 % CDF / S-4 | | | |
| | h. | Speed (rpm) | * | | | |
| | i. | Class of insulation | Class 'F' for sq. cage motors with temp rise limited to that of class B | | | |
| | j. | Number of starts/ hour | 150 starts / hr | | | |
| | k. | Contactors for motor | * | | | |
| | l. | Overload protection for motors provided | Yes | | | |
| **3.17.3** | | Space heater requirement | For motors of rating 30 KW and above | | | |
| **3.18.0** | | **Limit switches** | **Main hoist** | **Aux. Hoist --NA--** | **Cross Travel** | **Long Travel** |
| | a. | Type | Rotary gear + Gravity | | Lever type | |
| | b. | Number provided | 1 + 1 | --- | 2 | 2 |
| | c. | Rating of contacts | * | | | |
| | d. | Material of contacts | Double break Silver Cadmium | | | |
| | e. | Control voltage | 110V | | | |
| **3.19.0** | | **Power conductors (DSL)** | | | | |
| | a. | Type | LT: PVC shrouded conductor bus bar.<br>CT: Flexible trailing cable mounting on retracting support (Festoon type) ERP insulated Cu conductor as per IS: 9968 | | | |
| | b. | Size | * | | | |
| | c. | Material | * | | | |
| | d. | Numbers | * | | | |
| | e. | Length | To suit baylength | | | |
| **3.20.0** | | **Protective Panel** | | | | |
| | a. | Make | OEM | | | |

| | | | | |
|---|---|---|---|---|
| | b. | Size | * | |
| | c. | Material | Sheet steel 2 mm size | |
| | d. | Numbers and location | One number located in CT platform | |
| **3.21.0** | | **Control panel** | | |
| | a. | Make | OEM | |
| | b. | Size | * | |
| | c. | Material | Rolled sheet steel 2mm size | |
| | d. | Numbers and location | One each for MH, AH, CT and LT located on bridge platform | |
| | e. | Degree of protection | IP 54 | |
| **3.22.0** | | **Control for Hoists /CT/LT operations** | Through Variable Voltage Variable frequency drive | |
| | a. | Speed control | Thru' VVVF with minimum 6 pulse design | |
| | b. | Starting torque of VVVF | Up to 400 % typical with / without encoder | |
| | c. | Starting current | Less than 150 % of rated torque. | |
| | d. | Temperature | VVVF system shall be capable of withstanding upto 50 $^{o}$ C without derating. | |
| **3.23.0** | | **Additional Operation** | **Not Applicable** | |
| | a. | Type | NA | |
| | b. | Communication | NA | |
| | c. | Operation | NA | |
| | d. | Local unit | NA | |
| **3.24.0** | | **Cable** | **Power** | **Control** |
| | a. | Material | Copper | Copper |
| | b. | Type | FRLS PVC | |
| | c. | Size | Min 2.5 $mm^2$ for copper | Min 1.5 $mm^2$ |
| | d. | Voltage grade | 1100 V | |
| | e. | Voltage drop | Cable from main isolating switch (1.5M above operating floor) to motor terminal shall be so sized that the voltage drop does not exceed 3% of rated voltage. | |
| **3.25.0** | | **Earthing** | | |
| | a. | Material of earthing | G.I / Copper | |
| | b. | Earthing as per specification | Yes / No | |
| **3.26.0** | a. | **Contactors** | AC 4 duty for reversing application. AC 3 duty for non reversing application | |
| | b. | **Switches** | AC 23 for motor application, AC 22 for other application. | |

| | | | |
|---|---|---|---|
| | c. | **Fuses** | HRC |
| | d. | **Overload relay** | Temperature compensated bi metallic with single phasing preventor. |
| **3.27.0** | | **Power supply** | One(1) no. 415 V , 3 phase, 4 wire supply at operating floor at centre of bay length with change over switch. |
| **3.28.0** | | **Transformer** | |
| | a. | Quantity | 2 X 100 % for Control and 1 no for Lighting |
| | b. | Voltage Rating | Control 415/110V, Lighting 415/0-24-240V |
| | c. | KVA rating | 20% over loading to be considered while sizing the rating |
| **3.29.0** | | **Illumination** | |
| | a. | In cabin | ---NA--- |
| | b. | Over Bridge | 4 nos 60 W Bulk-head fittings with incandescent lamps and 4nos. 24V - 5A - 3 pin industrial socket |
| | c. | Under bridge | 4 nos 250 W HPSV lamps |
| | d | For inspection of crane components | One (1) portable 40 W hand lamp with min. half span length flexible cable for inspection of crane components |
| **3.30.0** | | **Fire Extinguisher** | |
| | a. | Type and size | 4.5 kg $CO_2$ type |
| | b. | Location | One on bridge |

| | TITLE | SPECIFICATION NO. |
|---|---|---|
| | **LV MOTORS** | VOLUME II B |
| | | SECTION D |
| | **DATA SHEET-A** | REV NO. 00 DATE 27/09/2011 |
| | | SHEET 1 OF 1 |

| | | | |
|---|---|---|---|
| 1.0 | Design ambient temperature | : | 50 °C |
| 2.0 | Maximum acceptable kW rating of LV motor | : | <160KW |
| 3.0 | Installation (Indoors/ Outdoors) | : | As required |
| 4.0 | Degree Of Protection | : | IP55 |
| 5.0 | Cooling | : | TEFC/CACA |
| 6.0 | Details of supply system | | |
| | a) Rated voltage (with variation) | : | 415V ± 10% |
| | b) Rated frequency (with variation) | : | 50 Hz (Variation: +5% TO –5%) |
| | c) Combined voltage & freq. variation | : | 10% (sum of absolute values) |
| | d) System fault level at rated voltage | : | 50 kA for 1 sec |
| | e) Short time rating for terminal boxes | | |
| | o 110kW & Above (Breaker controlled) | : | 50 kA for 1 sec |
| | o Below 110kW (MCCB+ Contactor controlled) | : | 50 KA for 0.20 sec. |
| | f) LV System grounding | : | Solidly |
| 7.0 | Class of insulation | : | Class ‘F’, with temp rise limited to class B. |
| 8.0 | Minimum voltage for starting (As percentage of rated voltage) | : | 80% of rated voltage |
| 9.0 | Power cables data | : | Shall be given during Detailed engg |
| 10.0 | Earth Conductor Size & Material | : | Shall be given during Detailed engg |
| 11.0 | Space heater supply | : | 240 V, 1Φ , 50 Hz |
| 12.0 | Rating up to which Single phase motor | : | Acceptable below 0.20 kW |
| 13.0 | Locked rotor current | | |
| | a) Limit as percentage of FLC | : | 600% |
| | b) Permissible tolerance, if any | : | 20% |
| 14.0 | Additional tests | : | As per QP |
| 15.0 | Flame-proof motor | | |
| | a) Enclosure suitable (As per IS:2148) | : | As per requirement |
| | b) Classification of Hazardous area (As per IS: 5572 part-I) | : | As per requirement |
| | c) Degree of protection | : | IP65 |
| 16.0 | Makes | : | AS PER ANNUXURE-I |

# ANNEXURE-I

SUB-VENDOR LIST

The list of approved make of the LT Motors are as mentioned below:

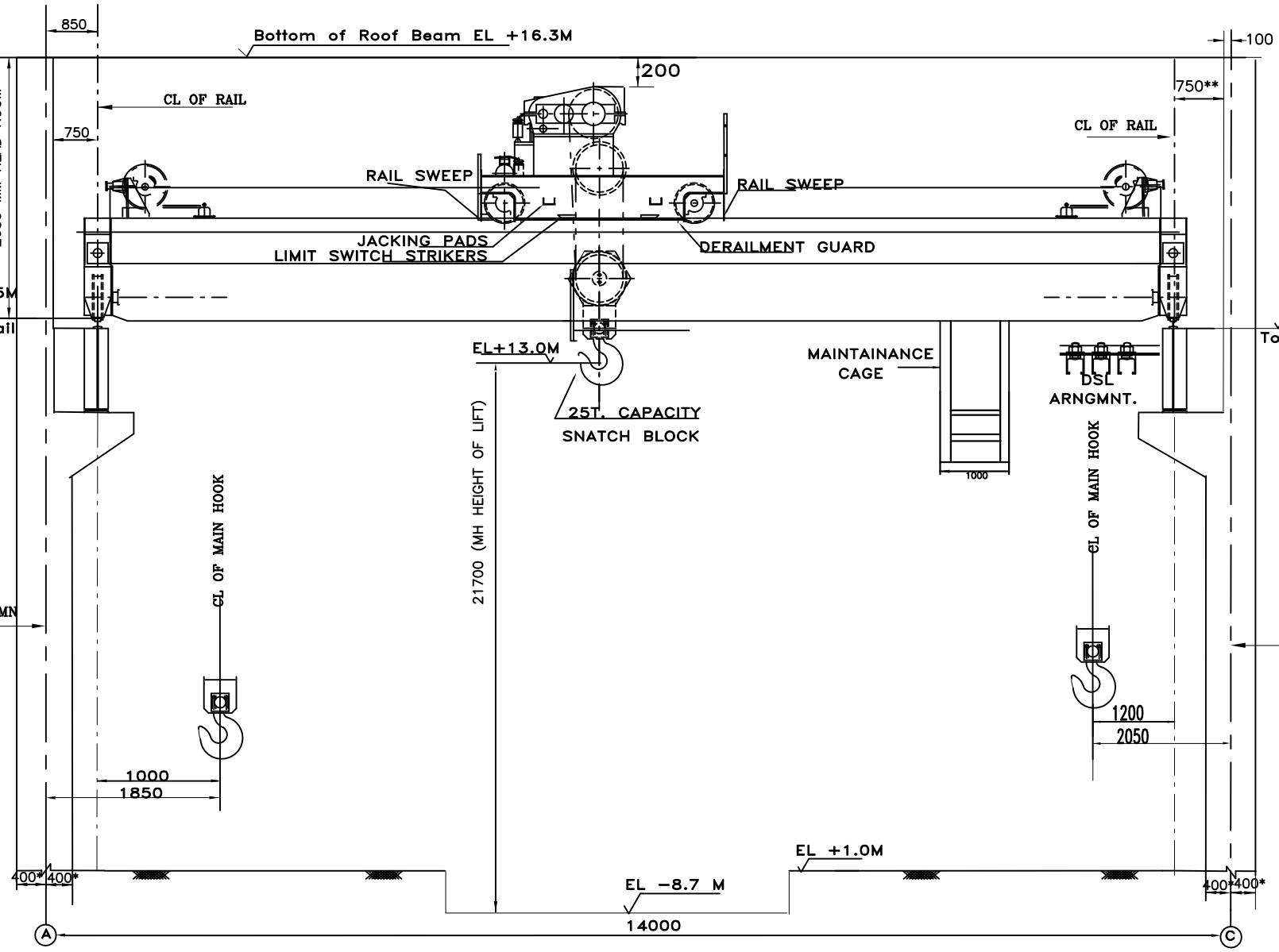
| S.No. | LIST OF LT MOTORS |
|---|---|
| 1. | BHARAT BIJLEE LTD. |
| 2. | CROMPTON GREAVES |
| 3. | ASEA BROWN BOVERI |
| 4. | KIRLOSKAR ELECTRIC CO LTD. |
| 5. | NGEF |
| 6. | SIEMENS |
| 7. | MARATHON |
| 8. | GE-POWER |
| 9. | RAJINDRA ELECT INDUSTRIES |
| 10. | LAXMI HYDRAULICS PVT. LTD |

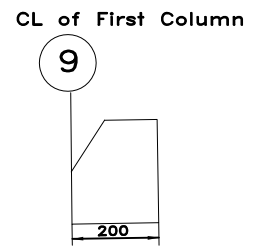
However, the final list of makes for the LT Motors is subjected to BHEL/Customer approval, during contract stage, without any commercial implications.

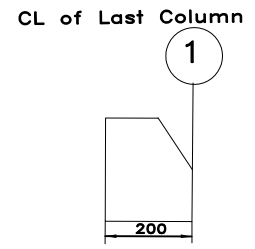
Fold-2 | ALL DIMENSIONS ARE IN MM | FIRST ANGLE PROJECTION | Fold-1

DRAWING No. PE-DG-314-501-A001-03

CUSTOMER'S DRAWING No.




No of crane = 1 no.

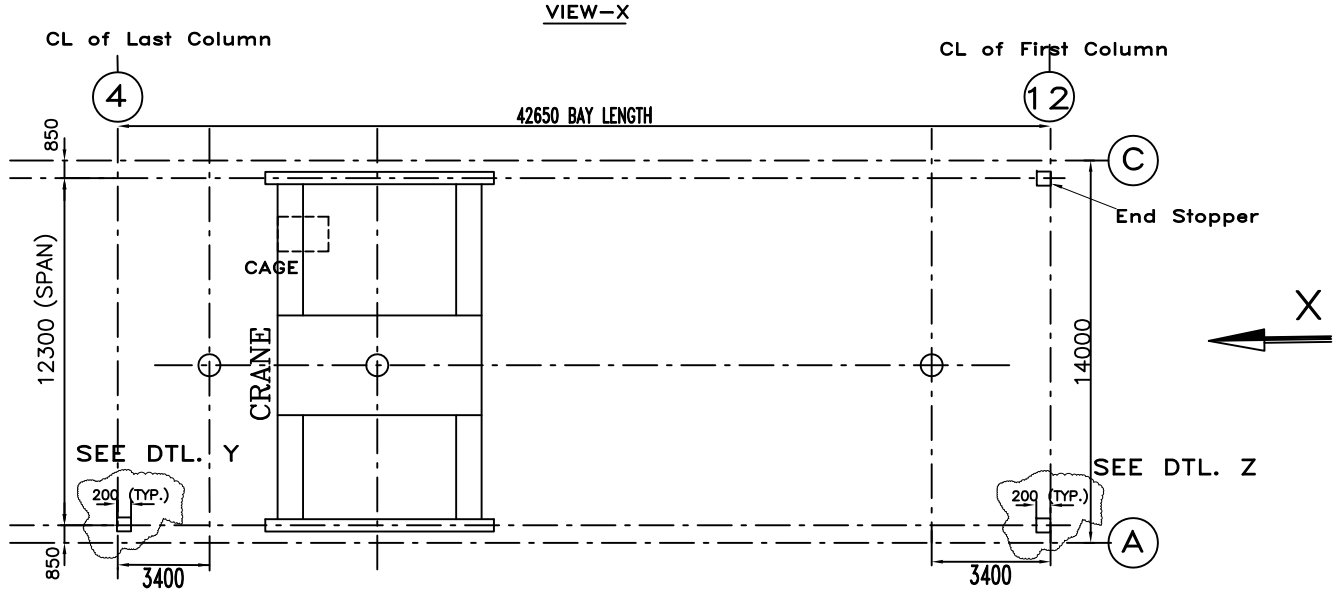
## REF

1) MECHANICAL GA OF CW & ACW PUMP HOUSE DRG NO. PE-DG-374-165-N001 Rev 0

## NOTES

1) ALL DIMENSIONS ARE IN MM & ELEVATIONS IN METRES.
2) BIDDER SHALL RESTRICT THE OVERHUNG PORTION OF THE CRANE AFTER CENTRE LINE OF THE COLUMN AS 250MM SO THAT THE MINIMUM CLEARANCE BETWEEN FACE OF THE COLUMN AND EDGE OF THE CRANE IS MAINTAINED AS 500 MM
3) SPAN , LIFT , HOOK APPROACHES & BAYLENGTH ARE SUBJECT TO FINAL CIVIL STRUCTURE.

VIEW-X




KEY PLAN

| | |
|---|---|
| CUSTOMER | BIHAR STATE ELECTRICITY BOARD |
| CUSTOMER'S CONSULTANT | steag STEAG ENERGY SERVICES (I) PVT. LTD. |
| PROJECT | 2 X 250 MW BSEB BARAUNI TPP |
| JOB NO. 314 | BHARAT HEAVY ELECTRICALS LTD, POWER SECTOR, PROJECT ENGINEERING MANAGEMENT, NEW DELHI |
| STATUS CONTRACT | |
| DRG./REF. NO. (INTERNAL) | |

| REV. | DATE | ALTD | CHD | APPD |
|---|---|---|---|---|
| | | | | |

| DEPT CODE | | NAME | SIGN | DATE |
|---|---|---|---|---|
| | DRN | LJ | | 09/01/12 |
| | DESN | LJ | | 09/01/12 |
| | CHD | GBC | | 09/01/12 |
| | APPD | SKB | | 09/01/12 |

TITLE: CRANE CLEARANCE DIAGRAM OF CW PUMP HOUSE 25 T (DOUBLE GIRDER) E.O.T. CRANE

DEPT. | SCALE | DRAWING NO. PE-DG-374-501-A002

SIGN | DATE | SHEET 1 OF 1 | SIZE-A3 | REV. 00



COMPUTER FILE NAME : TAL5

Fold-3 | Fold-3 | Fold-2

# Annexure-C

(Part of technical specification no. PE-TS-374-501-A002 for 2 X 250 MW BSEB, Barauni TPP)

**VENDOR HAS TO SUBMIT ONLY FOLLOWING DOCUMENTS ALONG WITH THE OFFER, FOR TECHNICAL EVALUATION OF THE BID:-**

1.0 Specific confirmation / Comments from the bidder as per BHEL Format.

2.0 'NO DEVIATION CERTIFICATE' – Clearly mentioning that bidder has considered 'No - Deviation' from the technical specification provided by BHEL.

OR

DEVIATION Sheet, indicating clause wise technical deviation, if any

3.0 Un-priced format with 'Quoted' mentioned against each serial number under each column.

**Note1:- Any other standard document/ details furnished by the bidder i.e. Data sheet / GA Drawing/ QAP etc. shall not be taken in to consideration for evaluation.**

**Note 2:- Bidder to note that if the bidder does not submit the documents mentioned in Sl. No. 1.0 to 3.0 along with their offer then their offer is liable to be rejected.**