Rev 02
17th Sept
2020

# NOTICE INVITING TENDER

(Document No PS: MSX:NIT)

**TENDER NO.: BHEL/NR/SCT/CHHABRA/ESP PASS-B/1257**

**NAME OF WORK: Restoration of ESP Pass-B Unit-4 at Chhabra RVUNL along with foundation dismantling & preparation of new foundations.**

Bharat Heavy Electricals Limited

Ref: BHEL/NR/SCT/CHHABRA/ESP PASS-B/1257
Date: 02/03/2022

==========

# NOTICE INVITING E-TENDER (NIT)
# NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES

==========

To

Dear Sir/Madam

**Sub : NOTICE INVITING E-TENDER**

Sealed offers in two part bid system (National competitive bidding (NCB) are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-1) for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

1.0 **Salient Features of NIT**

| SL NO | ISSUE | DESCRIPTION | |
|---|---|---|---|
| **i** | **TENDER NUMBER** | ***BHEL/NR/SCT/CHHABRA/ESP PASS-B/1257*** | |
| **ii** | **Broad Scope of job** | **Restoration of ESP Pass-B Unit-4 at Chhabra RVUNL along with foundation dismantling & preparation of new foundations** | |
| **iii** | **DETAILS OF TENDER DOCUMENT** | | |
| a | Volume-IA | *Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc* | *Applicable* |
| b | Volume-IB | *Special Conditions of Contract (SCC)* | *Applicable* |
| c | Volume-IC | *General Conditions of Contract (GCC)* | *Applicable* |
| d | Volume-ID | *Forms and Procedures* | *Applicable* |
| e | Volume-II | *Price Schedule (Absolute value).* | *Applicable* |
| **iv** | **Issue of Tender Documents** | **Tender documents will be available for downloading from BHEL eProcurement portal (*https://eprocurebhel.co.in)* till due date of submission:**<br>***Start: 02/03/2022, Time :16:00 hrs***<br>***Closes: 14/03/2022, Time: 10:00 hrs***<br>Brief information of the tenders shall also be available at BHEL website (**www.bhel.com**) | *Applicable* |
| **v** | **DUE DATE & TIME OF OFFER SUBMISSION** | ***Date: 14/03/2022 , Time : 10:00 hrs***<br>***Place : on https://eprocurebhel.co.in*** | *Applicable* |
| **vi** | **OPENING OF TENDER** | ***Date: 14/03/2022, Time : 15:30 hrs***<br>*Notes:*<br>*(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day.* | *Applicable* |

| | | | |
|---|---|---|---|
| | | *(2) Bidder may depute representative to witness the opening of tender. For e-Tender, Bidder may witness the opening of tender through e-Procurement portal only.* | |
| **vii** | **EMD AMOUNT** | *Rs. 21,01,651/-* | *Applicable* |
| **viii** | **COST OF TENDER** | *Free* | |
| **ix** | **LAST DATE FOR SEEKING CLARIFICATION** | ***Five days before bid submission due date*** *Along with soft version also, addressing to undersigned & to others as per contact address given below:*<br>*1) Name: Shabana Parveen*<br>*Designation: Manager*<br>*Deptt: SCT*<br>*Address: BHEL-PSNR, PLOT NO. 25, SECTOR – 16A, NOIDA - 201301*<br>*Phone: (Landline/Mobile) 0120 - 2416444*<br>*Email: shabana.parveen@bhel.in*<br><br>*2 ) Name: G.V.RAJASEKHAR*<br>*Designation: SR. Manager*<br>*Deptt: SCT*<br>*Address: BHEL-PSNR, PLOT NO. 25, SECTOR – 16A, NOIDA - 201301*<br>*Phone: (Landline/Mobile) 0120-2416232*<br>*Email : gvr@bhel.in* | *Applicable* |
| **x** | **SCHEDULE OF Pre Bid Discussion (PBD)** | *Date :* | *Not applicable.* |
| **xi** | **INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)** | *Please refer clause no. 15.* | *Applicable* |
| **xii** | **Latest updates** | Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc. to Tender Specifications will be hosted in BHEL webpage (www.bhel.com -->Tender Notifications →View Corrigendums), BHEL eProcurement portal (***https://eprocurebhel.co.in***) **and not in the newspapers**. Bidders to keep themselves updated with all such information. | |

2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed digitally using Class III DSC & uploaded in E-Procurement Portal, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

3.0 **Not Used.**

4.0 Unless specifically stated otherwise, bidder shall deposit EMD as per clause 1.9 of General Conditions of Contract.

For Electronic Fund Transfer the details are as below-:

**a) Name of the Beneficiary** -: Bharat Heavy Electricals Limited

**b) Bank Particulars**

| | | |
|---|---|---|
| i). | Bank Name -: | STATE BANK OF INDIA |
| ii). | Bank Telephone No.(with STD code)-: | 011-23475566 |
| iii). | Branch Address-: | CAG II BRANCH, NEW DELHI<br>4th & 5th FLOOR, REDFORT CAPITAL,<br>PARASNATH TOWERS, BHAI VEER SINGH<br>MARG, GOLE MARKET, NEW DELHI-110001 |
| iv). | Bank Fax No. (with STD code) -: | 011-23475566 |
| v). | Branch Code -: | 17313 |
| vi). | 9 Digit MICR Code of the Bank Branch -: | 110002562 |
| vii). | Bank Account Number -: | 10813608647 |
| viii). | Bank Account Type -: | CASH CREDIT |
| ix). | 11 Digit IFSC Code of Beneficiary Branch-: | SBIN0017313 |

(Note -: In case of E-Tenders, proof of remittance of EMD should be uploaded in the E-Procurement Portal and originals, as applicable, shall be sent to the officer inviting tender within a reasonable time, failing which the offer is liable to be rejected.)

5.0 **Procedure for Submission of Tenders**: This is an E-tender floated online through our E-Procurement Site (***https://eprocurebhel.co.in***). The bidder should respond by submitting their offer online only in our e-Procurement platform at (***https://eprocurebhel.co.in***). Offers are invited in two-parts only.

**Documents Comprising the e-Tender**

The tender shall be submitted online ONLY EXCEPT EMD (in physical form) as mentioned below:

**a. Technical Tender (UN priced Tender)**

All Technical details (e.g. Eligibility Criteria requested (as mentioned below)) should be attached in e-tendering module, failing which the tender stands invalid & may be REJECTED. Bidders shall furnish the following information along with technical tender (preferably in pdf format):

- **i.** Earnest Money Deposit (EMD) furnished in accordance with NIT Clause 4.0. Alternatively, documentary evidence for claiming exemption as per clause 29 of NIT.
- **ii.** Technical Bid (without indicating any prices).

**b. Price Bid:**

i. Prices are to be quoted in the attached Price Bid format online on e-tender portal.
ii. The price should be quoted for the accounting unit indicated in the e-tender document.
iii. Note: It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.
iv. A person signing (manually or digitally) the tender form or any documents forming part of the contract on behalf of another shall be deemed to warrantee that he has authority to bind such other persons and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the signatory liable for all cost and damages.
v. A tender, which does not fulfil any of the above requirements and/or gives evasive information/reply against any such requirement, shall be liable to be ignored and rejected.

**DO NOT'S**

Bidders are requested NOT to submit the hard copy of the Bid. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, the same shall not be considered. **Also, uploading of the price bid in prequalification bid or technical bid may RESULT IN REJECTION of the tender**.

**Digital Signing of e-Tender**

Tenders shall be uploaded with all relevant PDF/zip format. The relevant tender documents should be uploaded by an authorized person having Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION digital signature certificate (DSC).

**The Requirement:**

1. A PC with Internet connectivity &
2. DSC (Digital Signature Certificate) (**Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION**)

**The contact details of the service provider are given below:**

**For any technical related queries please call at 24 x 7 Help Desk Number**

**0120-4001 002, 0120-4001 005 & 0120-6277 787**

**International bidders are requested to prefix 91 as country code**

**Email Support - Technical - support-eproc@nic.in**

**Note: For any Issues or Clarifications relating to the published tenders, bidders are requested to contact the respective Tender Inviting Authority**

The process of utilizing e-procurement necessitates usage of **DSC (Digital Signature Certificate) (Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION)** and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the e-procurement secured site and take part in the tendering process.

The contact details of the DSC Certifying Authority as given below:

| Sl. No. | Name | Website Link |
|---|---|---|
| 1 | **GNFC** | www.ncodesolutions.com |
| 2 | **e-Mudhra** | http://www.e-Mudhra.com |
| **3** | **Safescrypt** | www.safescrypt.com |

Vendors are also requested to go through seller manual available on ***https://eprocurebhel.co.in***.

6.0 Not used.

7.0 Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

9.0 **Assessment of Capacity of Bidders:**

**Bidder's capacity for executing the job under tender shall be assessed 'LOAD' wise and 'PERFORMANCE' wise as per the following:**

I. **LOAD**: Load takes into consideration **ALL** the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The cut off month for reckoning 'Load' shall be the 3rd Month preceding the month corresponding to the 'latest date of bid submission', in the following manner -

(**Note:** For example, if latest bid submission is in Jan 2017, then the 'load' shall be calculated up to and inclusive of Oct 2016)

Total number of Packages in hand = Load (P)

Where 'P' is the sum of all unit wise identified packages (refer table-1) under execution with BHEL Regions as on the cut off month defined above, including packages yet to be commenced, excepting packages which are on Long Hold.

II. **PERFORMANCE**: Here 'Monthly Performance' of the bidder for all the packages (under execution/ executed during the 'Period of Assessment' in all Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding and including the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the 3rd Month preceding the month corresponding to 'latest date of bid submission', in the following manner:

(**Note**: For example, if 'latest date of bid submission' is in Jan 2017, then the 'performance' shall be assessed for a 6 months' period up to and inclusive of Oct 2016 (i.e. from May 2016 to Oct 2016), for all the unit wise identified packages (refer Table I))

i). Calculation of Overall 'Performance Rating' for 'Similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:

a) $P_1$, $P_2$, $P_3$, $P_4$, $P_5$ , …. $P_N$ etc. be the packages (under execution/ executed during the 'Period of Assessment' in all Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions = $\mathbf{P_T}$ (i.e. $P_T = P_1 + P_2 + P_3 + P_4 + \ldots P_N$)

b) Number of Months '$T_1$' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package $P_1$. Similarly $T_2$ for package $P_2$, T3 for package $P_3$, etc. for the tendered scope. Now calculate cumulative total months '$\mathbf{T_T}$' for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e. $\mathbf{T_T} = T_1 + T_2 + T_3 + T_4 + \ldots T_N$ )

c) Sum '$S_1$ 'of 'Monthly Performance Evaluation' Scores ($S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, $S_{1\text{-}5}$…. $S_{1\text{-}T1}$) for similar package $P_1$, for the 'period of assessment' '$T_1$' (i.e. $S_1 = S_{1\text{-}1} + S_{1\text{-}2} + S_{1\text{-}3} + S_{1\text{-}4} + S_{1\text{-}5} + \ldots S_{1\text{-}T1}$). Similarly, $S_2$ for package $P_2$ for period $T_2$, $S_3$ for package $P_3$ for period $T_3$ etc. for the tendered scope for all Regions. Now calculate cumulative sum '$S_T$' of 'Monthly Performance Evaluation' Scores for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e. '$S_T$'= $S_1 + S_2 + S_3 + S_4 + S_5 + \ldots S_N$.)

d) **Overall Performance Rating** '$\mathbf{R_{BHEL}}$' **for the Similar Package/Packages** (under execution/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL

$$= \frac{\text{Aggregate of Performance scores for all similar packages in all the Regions}}{\text{Aggregate of months for each of the similar packages for which performance should have been evaluated in all the Regions}}$$

$$= \frac{S_T}{T_T}$$

**e) Bidders to note that the risk of non-evaluation or non-availability of the 'Monthly Performance Evaluation' reports as per relevant formats is to be borne by the Bidder.**

**f) Table showing methodology for calculating 'a', 'b' and 'c' above**

| Sl. No. | Item Description | Details for all Regions | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| (i) | (ii) | (iii) | (iv) | (v) | (vi) | (vii) | (viii) | (ix) | (x) |
| 1 | Similar Packages for all Regions → (under execution/ executed during period of assessment) | $P_1$ | $P_2$ | $P_3$ | $P_4$ | $P_5$ | … | $P_N$ | Total No. of similar packages for all Regions = $\mathbf{P_T}$ i.e. Sum (Σ) of columns (iii) to (ix) |
| 2 | Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been done in the 'period of assessment' for corresponding Similar Packages ( as in row 1) | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | … | $T_N$ | Sum (Σ) of columns (iii) to (ix) = $\mathbf{T_T}$ |
| 3 | Monthly performance scores for the corresponding period (as in Row 2) | $S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, … $S_{1\text{-}T1}$ | $S_{2\text{-}1}$, $S_{2\text{-}2}$, $S_{2\text{-}3}$, $S_{2\text{-}4}$, … $S_{2\text{-}T2}$ | $S_{3\text{-}1}$, $S_{3\text{-}2}$, $S_{3\text{-}3}$, $S_{3\text{-}4}$, … $S_{3\text{-}T3}$ | $S_{4\text{-}1}$, $S_{4\text{-}2}$, $S_{4\text{-}3}$, $S_{4\text{-}4}$, … $S_{4\text{-}T4}$ | $S_{5\text{-}1}$, $S_{5\text{-}2}$, $S_{5\text{-}3}$, $S_{5\text{-}4}$, … $S_{5\text{-}T5}$ | .. … … … … | $S_{N\text{-}1}$, $S_{N\text{-}2}$, $S_{N\text{-}3}$, $S_{N\text{-}4}$, … $S_{N\text{-}TN}$ | -------- |
| 4 | Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3) | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_5$ | … | $S_N$ | Sum (Σ) of columns (iii) to (ix) = $\mathbf{S_T}$ |

ii). Calculation of Overall 'Performance Rating' ($\mathbf{R_{BHEL}}$) in case at least 6 evaluation scores for 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for ALL the packages, divided by the total number of Package months for which evaluation should have been done. '$R_{BHEL}$' shall be calculated subject to availability of 'performance scores' for at least 6 'package months' in the order of precedence below:

a) 'Period of Assessment' i.e. 6 months preceding and including the cut-off month
b) 12 months preceding and including the cut-off month
c) 24 months preceding and including the cut-off month

In case, $R_{BHEL}$ cannot be calculated as above, then Bidder shall be treated as 'NEW VENDOR'. Further eligibility and qualification of this bidder shall be as per definition of 'NEW VENDOR' described in 'Explanatory Notes'.

iii). Factor "L" assigned based on Overall Performance Rating ($R_{BHEL}$) at Power Sector Regions:

| Sl. no. | Overall Performance Rating ($R_{BHEL}$) | Corresponding value of 'L' |
|---|---|---|
| 1 | =60 | NA |
| 2 | > 60 and ≤ 65 | 0.4 |
| 3 | > 65 and ≤ 70 | 0.35 |
| 4 | > 70 and ≤ 75 | 0.25 |
| 5 | > 75 and < 80 | 0.2 |
| 6 | ≥ 80 | NA |

**iv).** Performance Systems: The performance rating as mentioned in II (i) and (ii) above, shall be calculated as per Online Systems i.e. Contractor Performance Evaluation System (CPES) and Safety Performance Evaluation System (HSEPES). The scores assigned in HSEPES shall be scaled down to 10 and assigned in CPES against the category "HSE" (mentioned in Form F-15).

**III. 'Assessment of Capacity of Bidder':**

'Assessment of Capacity of Bidder' is based on the Maximum number of packages for which a vendor is eligible, considering the performance scores of similar packages, as below:

Max number of packages $P_{Max}$= ($R_{BHEL}$ - 60) divided by corresponding value of 'L', i.e. ($R_{BHEL}$- 60)/L

Note:

i). In case the value of $P_{Max}$ results in a fraction, the value of $P_{Max}$ is to be rounded off to next whole number

ii). For $R_{BHEL}$ = 60, $P_{Max}$ = '1'

iii). For $R_{BHEL}$ ≥ 80, there will be no upper limit on $P_{Max}$

The Bidder shall be considered 'Qualified' as per 'Assessment of Capacity of Bidder' for the subject Tender if $P \leq P_{Max}$

(Where P is calculated as per clause 'I' above)

In addition to above, in case contractor fails to score more than 5 (five) marks in the scaled down scores of HSEPES for "more than 2 months in a period of 6 months preceding and including the cut-off month in any single package", the contractor shall be considered disqualified for ongoing tender(s) of BHEL. Qualification of bidder for further tendering process shall be subject to qualifying this condition in addition to qualifying requirements mentioned in PQR. Bidders who did not qualify this condition shall not be considered under the provisions of clause 9 IV (iv) of NIT.

IV. **Explanatory note**:

i). Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or C&I etc. at the individual level irrespective of rating of Plant and irrespective of whether the subject tender is a single package or as part of combined/composite packages. Normally Boiler, ESP, Piping, Turbine, Electrical, C&I, Civil, Structure etc. is considered individual level of package. For example, in case the tendered scope is a Boiler Vertical Package comprising of Boiler, ESP and Power Cycle Piping (i.e. the 'identified packages as per Table-1 below), the 'PERFORMANCE' part against sl. no. II above, needs to be evaluated considering all the identified packages (i.e. Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above.

ii). Identified Packages (Unit wise)

**Table-1**

| Civil | Electrical and C&I | Mechanical |
|---|---|---|
| i). Enabling works<br>ii). Pile and Pile Caps<br>iii). Civil Works including foundations | i). Electrical<br>ii). C&I<br>iii). Others (Elect. and C&I) | i). Boiler & Aux (All types including CW Piping if applicable)<br>ii). Power Cycle Piping/Critical Piping<br>iii). ESP |

| | | |
|---|---|---|
| iv). Structural Steel Fabrication & Erection<br>v). Chimney<br>vi). Cooling Tower<br>vii). Others (Civil) | | iv). LP Piping<br>v). Steam Turbine Generator set & Aux<br>vi). Gas Turbine Generator set & Aux<br>vii). Hydro Turbine Generator set & Aux<br>viii). Turbo Blower (including Steam Turbine)<br>ix). Material Management<br>x). FGD<br>xi). ACC<br>xii). Others (Mechanical) |

iii). Bidders who have not been evaluated for at least six package months in the last 24 months preceding and including the Cut-off month in the online BHEL system for contractor performance evaluation in BHEL PS Regions, shall be considered "NEW VENDOR".

A 'NEW VENDOR' shall be considered qualified subject to satisfying all other tender conditions.

A 'NEW VENDOR' if awarded a job (of package/packages identified under this clause) shall be tagged as "FIRST TIMER" on the date of first LOI from BHEL.

The "FIRST TIMER" tag shall remain till completion of all the contracts against which vendor has been tagged as First Timer or availability of 6 evaluation scores within last 24 months preceding and including the Cut-off month in the online BHEL system for contractor performance evaluation in BHEL PS Regions.

A Bidder shall not be eligible for the next job as long as the Bidder is tagged as "FIRST TIMER" excepting for the Tenders which have been opened on or before the date of the bidder being tagged as 'FIRST TIMER'.

After removal of 'FIRST TIMER' tag, the Bidder shall be considered 'QUALIFIED' for the future tenders subject to satisfying all other tender conditions including 'Assessment of Capacity of Bidders'.

iv). Consequent upon applying the criteria of 'Assessment of Capacity of Bidders' detailed above on all the bidders qualified against Technical and Financial Qualification criteria, if the number of qualified bidders reduces to less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then for further processing of the Tender, BHEL at its discretion reserves the right to also consider the bidders who are "not qualified" as per criteria of 'Assessment of Capacity of Bidders' and for this, procedure described in following three options shall be followed:

a) All the bidders having Overall Performance Rating ('$R_{BHEL}$') ≥60 shall be considered qualified against criteria of 'Assessment of Capacity of Bidders'.
b) If even after using option "a", the number of qualified bidders remains less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then in addition to bidders considered as per option "a", "First timer" bidders having average of available performance scores ≥60 upto and including the Cut Off month shall also be considered qualified against criteria of 'Assessment of Capacity of Bidders'.
c) If even after using option "a" and "b", the number of qualified bidders remains less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then in addition to bidders considered as per option "a" and "b", "First timer" bidders for whom no performance score is available in the system upto and including the Cut Off month, shall also be considered qualified against criteria of 'Assessment of Capacity of Bidders'.

**Note:-** In case, the number of bidders qualified against Technical and Financial Qualification criteria itself is less than minimum no. of bidders required for conducting RA as per extant RA Guidelines, then all bidders (a)- having Overall Performance Rating ('$R_{BHEL}$') ≥60, (b)- "First timer" bidders having average of available performance scores ≥60 upto and including the Cut Off month, (c)- "First timer" bidders for whom no performance score is available in the system upto and including the Cut Off month, shall be considered qualified against criteria of 'Assessment of Capacity of Bidders' for further processing of tender.

v). 'Under execution' shall mean works in progress as per the following:

a. Up to execution of 90% of anticipated Contract Value in case of Civil, MM, Structural and Turbo Blower Packages

b. Up to Steam Blowing in case of Boiler/ESP/Piping Packages

c. Up to Synchronization in all Balance Packages

Note: BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (a), (b) and (c) above, depending upon the balance scope of work to be completed.

vi). Contractor shall provide the latest contact details i.e. mail-ID and Correspondence Address to SCT Department, so that same can be entered in the Contractor Performance Evaluation System, and in case of any change/discrepancy same shall be informed immediately. Login Details for viewing scores in Contractor Performance Evaluation System shall be provided to the Contractor by SCT Department.

vii). Performance Evaluation for Activity Month shall be completed in Evaluation Month (i.e. month next to Activity Month) or in rare cases in Post Evaluation Month (i.e. month next to Evaluation Month) after approval from Competent Authority. In case scores are not acceptable, Contractor can submit Review Request to GM Site/ GM Project latest by 27th of Evaluation Month or 5 days after approval of score, whichever is later. However, acceptance/rejection of 'Review Request' solely depends on the discretion of GM Site/GM Project. After acceptance of Review Request, evaluation score shall be reviewed at site and the score after completion of review process shall be acceptable and binding on the contractor.

viii). Project on Hold due to reasons not attributable to bidder -

a. **Short hold:** Evaluation shall not be applicable for this period, however Loading will be considered.

b. **Long hold:** Short hold for continuous six months and beyond or hold on account of Force Majeure shall be considered as Long Hold. Evaluation as well as Loading shall not be considered for this period.

ix). Performance evaluation as specified above in this clause is applicable to Prime bidder and Consortium partner (or Technical tie up partner) for their respective scope of work.

10.0 Since the job shall be executed at site**,** bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc. before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail and/or through e-procurement portal, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc. or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.

14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at Clause no. 1, Salient Features of NIT, Sl. no. (xi) above.**

**"Integrity Pact (IP)"**

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

| Sl. No. | IEM | Email |
|---|---|---|
| 1. | Shri Arun Chandra Verma, IPS (Retd.) | acverma1@gmail.com |
| 2. | Shri Virendra Bahadur Singh, IPS (Retd.) | vbsinghips@gmail.com |

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

*Note:*

*No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are as per Clause no. 1, Salient Features of NIT, Sl. No. (ix) above.*

16.0 The Bidder has to satisfy the Pre-Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre-Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.

17.0 In case BHEL decides on a `Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorized representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.

18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.

19.0 BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com on "**supplier registration page**") for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price Bids of all the techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.

20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.

21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.

22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.

23.0 Consortium Bidding (or Technical Tie up) shall be allowed only if specified in Pre-Qualifying Requirement (PQR) criteria, and in such a case the following shall be complied with:

23.1 Prime Bidder and Consortium Partner or partners are required to enter into a consortium agreement for the said contract with a validity period of six months initially. In case bidder becomes L1, Consortium Agreement valid till contractual completion period shall be submitted to BHEL before signing the contract. Consortium Agreement shall be kept valid till scope of work awarded to consortium partner(s) as per contract is completed.

23.2 'Standalone' bidder cannot become a '**Prime Bidder' or a 'Consortium bidder' or 'Technical Tie up bidder' in a consortium (or Technical Tie up) bidding**. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner may enter into consortium agreement with other prime bidders. In case of non-compliance, consortium bids of such Prime bidders will be rejected.

23.3 Number of partners for a Consortium Bidding (or Technical Tie up) including Prime Bidder shall be NOT more than 2 (two).

23.4 Prime Bidder shall be as specified in the Pre-Qualification Requirement, else the bidder who has the major share of work.

23.5 In order to be qualified for the tender, Prime Bidder and Consortium partner or partners shall satisfy (i) the Technical 'Pre Qualifying Requirements' specified for the respective package, (ii) "Assessment of Capacity of Bidder' as specified in clause 9.0.

23.6 Prime Bidder shall comply with additional 'Technical' criteria of PQR as defined in 'Explanatory Notes for the PQR'.

23.7 Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified

23.8 In case customer approval is required, then Prime Bidder and Consortium Partner or partners shall have to be individually approved by Customer for being considered for the tender.

23.9 Prime Bidder shall be responsible for the overall execution of the contract.

23.10 In case of award of job, Performance shall be evaluated for Prime Bidder and Consortium Partner or partners for their respective scope of work(s) as per prescribed formats.

23.11 In case the Consortium partner or partners back out, their SDs shall be encashed by BHEL and BHEL shall take necessary action as per extant guidelines. In such a case, other consortium partner or partners meeting the PQR have to be engaged by the Prime Bidder, and if not, the respective work will be withdrawn and executed on risk and cost basis of the Prime Bidder. The new consortium partner or partners shall submit fresh SDs as applicable.

23.12 In case Prime Bidder withdraws or insolvency / liquidation / winding up proceedings have been initiated / admitted against the Prime Bidder, BHEL reserves the right to cancel, terminate or short close the contract or take any other action to safeguard BHEL's interest in the Project / Contract. This action will

be without prejudice to any other action that BHEL can take under Law and the Contract to safeguard interests of BHEL.

23.13 After execution of work, the work experience shall be assigned to the Prime Bidder and the consortium partner or partners for their respective scope of work. After successful execution of one work with a consortium partner under direct order of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders.

23.14 The consortium partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value. In case there are two consortium partners, then each partner shall submit SD equivalent to 0.5% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value. However, Prime Bidder has also option for submission of SD on behalf of consortium partner (s).

SD submitted by Consortium Partner(s) may be released in case corresponding scope of work of the respective Consortium partner(s) has been completed upto the extent of 80% based on certification by Construction Manager and concurrence by the prime bidder.

23.15 In case of a Technical Tie up, all the clauses applicable for the Consortium partner shall be applicable for the Technical Tie up partner also.

24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self-certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.

25.0 The bidder may have to produce original document for verification if so decided by BHEL.

26.0 The consultant / firm (and any of its affiliates) shall not be eligible to participate in tender(s) for the related works or services for the same project, if they were engaged for the consultancy services.

27.0 Guidelines/rules in respect of Suspension of Business dealings, Vendor evaluation format, Quality, Safety & HSE guidelines, Experience Certificate, etc. may undergo change from time to time and the latest one shall be followed. The abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' is available on www.bhel.com on "**supplier registration page**".

28.0 The offers of the bidders who are on the banned/ hold list and also the offer of the bidders, who engage the services of the banned/ hold firms, shall be rejected. The list of **banned/ hold firms** is available on BHEL web site www.bhel.com.

28.1 Integrity commitment, performance of the contract and punitive action thereof:

28.1.1 **Commitment by BHEL:**

BHEL commits to take all measures necessary to prevent corruption in connection with the tender Process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

28.1.2 **Commitment by Bidder/ Supplier/ Contractor:**

(i) The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

(ii) The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with

the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

(iii) The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the prices or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extent guidelines of the company available on www.bhel.com and / or under applicable legal provisions.

29.0 **Not Applicable**

30.0 The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

31.0 **PREFERENCE TO MAKE IN INDIA:**

For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/Non-Local Supplier and purchase preferences to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.

31.1 **Compliance to Restrictions under Rule 144 (xi) of GFR 2017**

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Clause means:-
   a. An entity incorporated established or registered in such a country; or
   b. A subsidiary of an entity incorporated established or registered in such a country; or
   c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
   d. An entity whose *beneficial owner* is situated in such a country; or
   e. An Indian (or other) agent of such an entity; or
   f. A natural person who is a citizen of such a country; or
   g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

IV. The *beneficial owner* for the purpose of (III) above will be as under:
   1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.
      Explanation
      a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company.

b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.
3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person has ownership of or entitlement to more than fifteen percent of the property or capital or profits of the such association or body of individuals.
4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

**Note:**

(i) The bidder shall provide undertaking for their compliance to this Clause, in the format provided in Annexure-11.

(ii) Registration of the bidder with Competent Authority should be valid at the time of submission of bids and at the time of acceptance of the bids.

32.0 **Not used**

33.0 In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/ draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

34.0 The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

35.0 **Not used**

36.0 Order of Precedence:

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

a. Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL
b. Notice Inviting Tender (NIT)
c. Price Bid
d. Technical Conditions of Contract (TCC)—Volume-1A
e. Special Conditions of Contract (SCC) —Volume-1B
f. General Conditions of Contract (GCC) —Volume-1C
g. Forms and Procedures —Volume-1D

It may please be noted that guidelines/ circulars/ amendments/ govt. directives issued from time to time shall also be applicable.

for BHARAT HEAVY ELECTRICALS LTD

(SCT)

**Enclosure:**

(i) Annexure-1: Pre Qualifying Requirements.
(ii) Annexure-2: Check List.
(iii) Annexure-3: Not used
(iv) Annexure-4: Reverse Auction Process Compliance Form
(v) Annexure-5: Authorization of representative who will participate in the online Reverse Auction Process
(vi) Annexure-6: RA Price Confirmation and Breakup
(vii) Annexure-7: Integrity Pact
(viii) Annexure-8: Undertaking as per D-4 of Annexure-1 i.e. PQR
(ix) Annexure-9: Declaration reg. Related Firms & their areas of Activities
(x) Annexure-10: Declaration reg. minimum local content in line with revised public procurement
(xi) Annexure-11: Declaration by the Contractor
(xii) Other Tender documents as per this NIT.

**ANNEXURE - 1**

## PRE QUALIFYING REQUIREMENTS (PQR)

| | | |
|---|---|---|
| JOB | Restoration of ESP Pass-B Unit-4 at Chhabra RVUNL along with foundation dismantling & preparation of new foundations | |
| TENDER NO. | BHEL/NR/SCT/CHHABRA/ESP PASS-B/1257 | |
| **SL. NO.** | **NAME AND DESCRIPTION OF PRE-QUALIFICATION CRITERIA** | |
| **A** | Submission of Integrity Pact duly signed | **Applicable** |
| **B** | Assessment of Capacity of Bidder to execute the work as per sl. no. 9 of NIT | **Applicable – by BHEL** |
| **C** | **Technical**<br>Bidder who wish to participate should have experience as follows: | |
| **C-1** | **ESP Works:**<br>EXECUTED<br>1) One Boiler (consisting of Structure and Pressure part of the same unit as standalone bidder) / ESP of one unit of ≥100 MW.<br>OR<br>2) One STG of ≥190 MW, under direct order of BHEL.<br>OR<br>3) R & M / RETROFTITTING of One ESP of 100 MW or higher involving erection of Minimum 800 MT in single unit.<br>OR<br>4) R&M / RETROFTITTING of One boiler of 100 MW or higher involving erection of Minimum 2000 MT | **Applicable** |
| **C-2** | **Civil Works:** | |
| **C-2.1** | Bidder should have executed similar work for any one of the following -<br>One (1) work of value not less than Rs 4.66 Crores<br>OR<br>Two (2) works each of value not less than Rs 2.91 Crores<br>OR<br>Three (3) works each of value not less than Rs 2.33 Crores<br><br>Note: 'Similar Works' means "Piling or Civil or Structural or 'Civil and Structural works' or RCC Chimney or RCC Cooling Tower or RCC Silo or Mill Bunker or any combination of these shall be considered." | **Applicable** |

| | | |
|---|---|---|
| **C-2.2** | 1) Bidder should have Executed at least 660 CUM RCC quantities within a common period of twelve consecutive months in cumulative of two running/completed contracts.<br>OR<br>2) Bidder should have Executed at least 440 CUM RCC quantities within a period of twelve consecutive months in one running/completed contract. | **Applicable** |
| **D**<br>**D-1** | **FINANCIAL:**<br>Bidder must have achieved an average annual financial turnover (Audited) of Rs. 3.31 Crores or more over three consecutive FY from immediate four previous FYs i.e. (2017-18, 2018-19 & 2019-20 OR 2018-19, 2019-20 & 2020-21). Bidder shall submit the Audited Balance Sheet and Profit & Loss Account in support of this.<br>In case audited financial statements have not been submitted for all the three years as indicated above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years.<br><br>If financial statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant. | **Applicable** |
| **D-2** | Net Worth (Only in case of companies) of the Bidder should be positive.<br><br>Note: Net worth shall be calculated based on the latest Audited Accounts as furnished for 'D-1' above.<br>Net worth= Paid up share capital + Reserves | **Applicable** |
| **D-3** | Bidder must have earned profit in any one of the three Financial Years as applicable in the last three Financial Years as furnished for 'D-1' above.<br>Note: PROFIT shall be PBT earned during any one year of last three financial years as in D-1 above. | **Applicable** |
| **D-4** | Bidder including Consortium bidder, if any, must not be under Insolvency Resolution Process or Liquidation or Bankruptcy Code Proceedings (IBC) as on date, by NCLT or any adjudicating authority/authorities, which will render him ineligible for participation in this tender, and shall submit undertaking (Annexure-8) to this effect. | **Applicable** |
| **E** | Approval of Customer<br>Note: Names of bidders (including consortium/Technical Tie up partners in case consortium bidding is permitted) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval. | **Applicable – by BHEL** |
| **F** | Price Bid Opening<br>***Note:*** *Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria* ***A to E*** | **By BHEL** |
| **G** | Consortium Criteria | **Applicable** |

**Note for technical Criteria:**

1. For C-1, the word Executed means achievement of milestone as defined below:
a. "BOILER LIGHT UP" in respect of Boiler / CFBC/ESP.
b. "CHARGING OF ATLEAST ONE PASS" in respect of ESP R & M.
c. "GAS IN" in respect of HRSG.
d. "SYNCHRONISATION" in respect of STG.

2. For C-1, Boiler Means HRSG / WHRB or any other type of Steam Generator.

3. For C-1, For the purpose of evaluation of the PQR, one MW shall be considered equivalent to 3.5 TPH where ever rating of HRSG/ Boiler is mentioned in MW.

**Common Explanatory Notes:**

1. For evaluation of PQR, in case Bidder alone does not meet the pre-qualifying technical criteria C-2.1 above, bidder may utilize the experience of its Parent Subsidiary Company along with its own experience, subject to following:
a. The parent company shall have a controlling stake of ≥50% in the subsidiary company (as per Format-1).
b. The Parent Company/ Subsidiary Company of which experience is being utilized for bidding shall submit Security Deposit(SD) equivalent to 1% of the total contract value.
c. The parent subsidiary company and bidder shall provide an undertaking that they are jointly or severally responsible for successful performance of the contract (as per Format-2).
d. In case Bidder is submitting bid as a Consortium Partner, option of utilizing experience of parent/subsidiary Company can be availed by Prime Bidder only.
e. Parent Company/ Subsidiary Company of which experience is being used for bidding, cannot participate as a 'Standalone Bidder' or as a 'Consortium bidder'.

2. Completion date for achievement of the technical criteria should be in the last 7 years ending on the 'latest date of Bid Submission of Tender irrespective of date of the start of work. Completion date shall be reckoned from the "FY quarter of bid submission".
3. "Executed" means the bidder should have achieved the technical criteria specified as above even if the Contract has not been completed or closed.
4. In case of Consortium the following shall be complied with:
   i. If Bidder i.e. Prime Bidder, meets the technical criteria at C-1 above, they shall be allowed to have a technical tie up or consortium with another experienced party meeting the technical criteria at Sl. No. C-2.1 & C-2.2 above.
   ii. Number of partners including Prime Bidder shall be NOT more than 02 (Two).
   **iii.** All other conditions of consortium shall be as per clause no 23.0 of NIT.

5. For sl.no. 'C-2.1' above, Value of work is to be updated with indices for "All India Avg. Consumer Price index for industrial workers" and "Monthly Whole Sale Price Index for All Commodities" with base month as per last month of work execution and indexed up to three (3) months prior to the month of latest due date of bid submission as per following formula-

$P = R + \{0.425 \times R \times (X_N - X_o) / X_o\} + \{0.425 \times R \times (Y_N - Y_o) / Y_o\}$

Where

P = Updated value of work
R = Value of executed work

$X_N$ = All India Avg. Consumer Price index for industrial workers for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).

$X_0$ = All India Avg. Consumer Price index for industrial workers for last month of work execution

$Y_N$ = Monthly Whole Sale Price Index for All Commodities for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).

$Y_0$ = Monthly Whole Sale Price Index for All Commodities for last month of work execution.

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

Credentials submitted by the bidder against "PRE QUALIFYING CRITERIAS" shall be verified for its authenticity. In case, any credential (s) is/are found unauthentic, offer of the bidder is liable to the rejection. BHEL reserves the right to initiate any further action as per extant guidelines for Suspension of Business Dealings.

Format-1

**Certificate for relationship between Parent Company / Subsidiary Company and the bidder**

To,
…….

…….

Dear Sir,

**Sub:** Bid for NIT No ……..dated…… for "……." (name of the tender).

We hereby certify that M/s……..…… is Parent Company/ Subsidiary Company of M/s ..…….(the bidder) and details of equity holding of the Parent Company in Subsidiary Company as on ……..(not earlier than seven days prior to the Bid Submission Date) are given as below:

| Name of Parent Company | Name of Subsidiary Company | Percentage of Equity Holding of Parent Company in Subsidiary Company |
|---|---|---|
| | | |

**(Insert Name and Signature of Statutory Auditor or practicing Company Secretary of the Bidder)**

Format-2

## Undertaking from the Parent Company/ Subsidiary Company of the bidder

***(On the Letter Head of Parent Company/ Subsidiary Company, as applicable)***

From,
Name:
Full Address:

Telephone No.:
E-mail address:
Fax/No.:

To,
……..
……..

Dear Sir,

We refer to the NIT No .....dated…… for "……." (name of the Tender).

"We have carefully read and examined in detail the NIT/Tender Terms and Conditions, including in particular, Clause .... of the NIT/Tender, regarding submission of an Undertaking, as per the prescribed Format 1 of the NIT/ Tender.

We confirm that M/s…… (the Bidder) has been authorized by us to use our Technical capability for meeting the Technical Criteria as specified in Clause……..of the PQR of the NIT/Tender referred above.

We agree to submit the Security Deposit equivalent to 1% of the total contract value in addition to Security Deposit to be submitted by Bidder as per Clause…….....of the NIT/Tender for fulfilment of all obligations in terms of provisions of the contract, in the event of ……..(the Bidder) being selected as the Successful Bidder.

We confirm that we along with M/s……(the bidder), are jointly or severally responsible for successful performance of the contract.
We confirm that our company shall not participate in the above tender as a 'Standalone Bidder' or as a 'Consortium bidder' and also shall not authorize any other bidder to use our Technical capability for the above tender.

All the terms used herein but not defined, shall have the meaning as ascribed to the said terms under the referred NIT/Tender.

**Signature of Managing Director/Authorized signatory of Parent/ Subsidiary Company**

## ANNEXURE - 2

### CHECK LIST

**NOTE:- Tenderers are required to fill in the following details and no column should be left blank**

| | | |
|---|---|---|
| **1** | **Name of the Tenderer** | |
| **2** | **Address of the Tenderer** | |
| **3** | **Type of the Firm/ Company** | |
| **(i)** | In case of Individual Tenderer | His / her full name, address and place & nature of business shall be furnished along with the offer. |
| **(ii)** | In case of Partnership Firm | The names of all the partners and their addresses, A copy of the partnership deed/instrument of partnership dully certified by the Notary Public shall be furnished along with the offer.. |
| **(iii)** | In case of Companies | a) Date and place of registration including date of commencement certificate in case of Public Companies (certified copies of Memorandum and articles of Association are also to be furnished).<br>b) Nature of business carried on by the Company and the provisions of the Memorandum relating thereof. |
| **4.a** | **Details of Contact person for this Tender** | Name : Mr/ Ms<br>Designation:<br>Telephone No:<br>Mobile No:<br>Email ID: |
| **4.b** | **Details of alternate Contact person for this Tender** | Name : Mr/ Ms<br>Designation:<br>Telephone No:<br>Mobile No:<br>Email ID: |
| **5** | **EMD DETAILS** | |
| **6** | **Validity of Offer** | TO BE VALID FOR **SIX MONTHS** FROM DUE DATE |

| | **DESCRIPTION** | **APPLICABILITY (BY BHEL)** | **ENCLOSED BY BIDDER** |
|---|---|---|---|
| **7** | Whether all pages of the Tender documents including annexures, appendices etc are read and understood | Applicable | YES / NO |
| **8** | Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE – 1 ) is understood and filled with proper supporting documents referenced in the specified format | Applicable | YES / NO |
| **9** | Audited Balance Sheet and profit & Loss Account for the last three years | Applicable | YES / NO |
| **10** | Copy of PAN Card | Applicable | YES / NO |
| **11** | Copy of GST registration | Applicable | YES / NO |

| SL. NO. | DESCRIPTION | APPLICABILITY (BY BHEL) | ENCLOSED BY BIDDER |
|---|---|---|---|
| 12 | Organization Chart of the tenderer's organization, including the names, addresses and contact information of the Directors/Partners shall be furnished along with the offer. | Applicable | YES / NO |
| 13 | Integrity Pact (Annexure – 7 of NIT) | Applicable | YES / NO |
| 14 | Annexures – 5, 8, 9, 10 & 11 of NIT | Applicable | YES / NO |
| 15 | Offer forwarding letter / tender submission letter ***[Form No. F-01 (Rev 00)]*** | Applicable | YES / NO |
| 16 | Declaration by Authorised Signatory ***[Form No: F-02 (Rev 00)]*** | Applicable | YES / NO |
| 17 | Declaration by Authorised Signatory regarding Authenticity of submitted documents ***[Form No: F-02A (Rev 00)]*** | Applicable | YES / NO |
| 18 | No Deviation Certificate ***[Form No: F-03 (Rev 00)]*** | Applicable | YES / NO |
| 19 | Declaration confirming knowledge about Site Conditions ***[Form No: F-04 (Rev 00)]*** | Applicable | YES / NO |
| 20 | Declaration for relation in BHEL ***[Form No: F-05 (Rev 00)]*** | Applicable | YES / NO |
| 21 | Non-Disclosure Certificate ***[Form No: F-06 (Rev 00)]*** | Applicable | YES / NO |
| 22 | Bank Account Details for E-Payment ***[Form No: F-07 (Rev 00)]*** | Applicable | YES / NO |
| 23 | Format for seeking clarification ***[Form No: F-08 (Rev 00)]*** | Applicable | YES / NO |
| 24 | Capacity Evaluation of Bidder for current Tender ***[Form No: F-09 (Rev 00)]*** | Applicable | YES / NO |
| 25 | Tie Ups/Consortium Agreement are submitted as per format [ **Form No: F-22 (Rev 00)]** | Applicable | YES/NO |
| 26 | Power of Attorney for Submission of Tender/Signing Contract Agreement ***[Form No: F-25 (Rev 00)]*** | Applicable | YES / NO |
| 27 | Analysis of Unit rates ***[Form No: F-26 (Rev 00)]*** | Applicable | YES / NO |

NOTE: STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED **ABOVE APPLICABLE DOCUMENTS** ARE LIABLE TO BE SUMMARILY REJECTED.

**DATE :**

**Sign. of the AUTHORISED SIGNATORY**
**(With Name, Designation and Company seal)**

## ANNEXURE – 3

**Not Used**

**ANNEXURE - 4**

**Reverse Auction Process Compliance Form**

**(The bidders are required to print this on their company's letterhead and sign, stamp before RA)**

To

- M/s. {*Service provider*
- *Postal address}*

**Sub: Agreement to the Process related Terms and Conditions**

Dear Sir,

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the RFQ document for {Items} against BHEL enquiry/ RFQ no.{……} dt. {…….}
This letter is to confirm that:

1) The undersigned is authorized official/ representative of the company to participate in RA and to sign the related documents.
2) We have studied the Reverse Auction guidelines (as available on www.bhel.com), and the Business rules governing the Reverse Auction as mentioned in your letter and confirm our agreement to them.
3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.
4) We also confirm that, in case we become L1 bidder, we will FAX/ email the price confirmation & break up of our quoted price as per *Annexure - 6* within **two** working days (of BHEL) after completion of RA event, besides sending the same by registered post/ courier both to M/s. BHEL and M/s. {*Service provider.}*

We, hereby confirm that we will honor the Bids placed by us during the auction process.

With regards

Signature with company seal

Name:
Company / Organization:
Designation within Company / Organization:
Address of Company / Organization:

**Sign this document and FAX/ email it to M/s *{Service provider}* at *{……..}* prior to start of the Event.**

**ANNEXURE – 5**

**Authorization of representative who will participate in the on line Reverse Auction Process:**

| | | |
|---|---|---|
| 1 | NAME OF THE BIDDER | |
| 2 | NAME & DESIGNATION OF OFFICIAL | |
| 3 | POSTAL ADDRESS (COMPLETE) | |
| 4 | TELEPHONE NOS. (LAND LINE & MOBILE BOTH) | |
| 5 | E-MAIL ADDRESS | |
| 6 | NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION | |

**ANNEXURE – 6**

**RA price confirmation and breakup**
**(To be submitted by L1 bidder after completion of RA)**

**To**
- M/s. *Service provider*
- *Postal address*

CC: M/s BHEL
*{Unit-*
*Address-}*
Sub: **Final price quoted during Reverse Auction and price breakup**

Dear Sir,

We confirm that we have quoted.

**Rs.{____in value & in words_____} for item(s) covered under tender enquiry No. {...} dt.{…}**

Total price of the items covered under above cited enquiries is inclusive of {*Packing & forwarding, GST, E.D., C.S.T., freight and insurance charges up to {……} District,{……..} State and Type Test Charges etc., (exclusive of service tax)*, *other as per NIT*}

as our final landed prices as quoted during the Reverse Auction conducted today {*date*} which will be valid for a period of {___ **in nos. & in words** ___} days.

The price break-up is as given below.

========
Total - Rs. **in value & in words**
========

Yours sincerely,

For _____

**Name:**
**Company:**
**Date:**
**Seal:**

**ANNEXURE – 7**

## INTEGRITY PACT

Integrity Pact format attached separately

**ANNEXURE – 8**

# UNDERTAKING

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

**To,**

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir/Madam,

**Sub: DECLARATION REGARDING INSOLVENCY/ LIQUIDATION/ BANKRUPTCY PROCEEDINGS**

**Ref**: NIT/Tender Specification No:

I/We, _____

declare that, I/We am/are not under insolvency resolution process or liquidation or Bankruptcy Code Proceedings (IBC) as on date, by NCLT or any adjudicating authority/authorities, which will render us ineligible for participation in this tender.

**Sign. of the AUTHORISED SIGNATORY**
**(With Name, Designation and Company seal)**

Place:
Date:

**ANNEXURE-9**

**DECLARATION**

Date: _____

To: _____
Address: BHEL,_____
_____
_____
_____
Email: _____

Sub: **Details of related firms and their area of activities**

Dear Sir/ Madam,

Please find below details of firms owned by our family members that are doing business/ registered for same item with BHEL, _____ (NA, *if not applicable*)

| | | |
|---|---|---|
| 1 | Material Category/ Work Description | |
| | Name of Firm | |
| | Address of Firm | |
| | Nature of Business | |
| | Name of Family Member | |
| | Relationship | |
| 2 | Material Category/ Work Description | |
| | Name of Firm | |
| | Address of Firm | |
| | Nature of Business | |
| | Name of Family Member | |
| | Relationship | |
| … | | |

***Note: I certify that the above information is true and I agree for penal action from BHEL in case any of the above information furnished is found to be false.***

Regards,

(_____)

From: M/s _____
Supplier Code: _____
Address: _____
_____
_____

**Annexure-10**

**DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH JUNE, 2020 AND SUBSEQUENT ORDER(S)**

*(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)*

---

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

**Sub**: Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04th June, 2020 and subsequent order(s).

**Ref :** 1) NIT/Tender Specification No: ……,
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by…… *(specify the name of the organization here)* has a local content of _____ % and this meets the local content requirement for **'Class-I local supplier' / 'Class II local supplier' **** as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

1. _____ 2. _____

3. _____ 4. _____

…
…
…

Thanking you,
Yours faithfully,

**(Signature, Date & Seal of Authorized Signatory of the Bidder)**

****** - *Strike out whichever is not applicable.*

**Note:**

1. Bidders to note that above format Duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies).
3. In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder.

**ANNEXURE-11**

**DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017**

*(To be typed and submitted in the Letter Head of the Entity/ Firm providing certificate as applicable)*

---

To,
(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

**Sub**: Declaration regarding compliance to Restrictions under Rule 144 (xi) of GFR 2017

**Ref :** 1) NIT/Tender Specification No: ……,
2) All other pertinent issues till date

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries. I certify that _____ (**SPECIFY THE NAME OF THE ORGANIZATION HERE**), is not from such a country/ has been registered with the Competent Authority (*attach valid registration by the Competent Authority, i.e., the Registration Committee constituted by the Dept. for Promotion of Industry and Internal Trade (DPIIT*); and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. (*attach relevant valid registration, if applicable*)

I hereby certify that we fulfil all requirements in this regard and is eligible to be considered.

Thanking you,
Yours faithfully,

**(Signature, Date & Seal of**
**Authorized Signatory of the Bidder)**

**Note:** Bidders to note that in case above certification given by a bidder, whose bid is accepted, is found to be false, then this would be a ground for immediate termination and for taking further action in accordance with law and as per BHEL guidelines.

BHEL-IP

# INTEGRITY PACT

**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

**and**

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

## Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____

_____ . The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

## Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

## Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

## Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

## Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

## Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

## Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.

6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

## Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

## Section 8 - Independent External Monitor(s)

8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.

8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.

8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.

8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.12 The word 'Monitor' would include both singular and plural.

## Section 9 - Pact Duration

9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.

9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

## Section 10 - Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

---

For & On behalf of the Principal

(Office Seal)

---

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place----------

Date----------

Witness:_____

(Name & Address) _____

_____

Witness:_____

(Name & Address) _____

_____

वी. के. गुप्ता/V. K. GUPTA
अपर महाप्रबंधक (उप संविदा एवं क्रय)
Addl.General Manager (SCP)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड, पावर सेक्टर-उत्तरी क्षेत्र
Bharat Heavy Electricals Ltd., Power Sector-Northern Region
प्लॉट सं.25, सेक्टर-16ए, नोएडा/Plot No.25, Sec.16A, Noida

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Part-I

NAME OF WORK: RESTORATION OF ESP PASS-B UNIT 4# AT CHHABRA TPS RVUNL

BHARAT HEAVY ELECTRICALS LIMITED

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

**THE TECHNICAL CONDITIONS OF CONTRACTS (TCC) ARE DEFINED AS:**



**Note: In case of any contradiction, TCC shall prevail over GCC.**

# Chapter I: PROJECT INFORMATION

| | Title | Description |
|---|---|---|
| 1 | **Owner** | RVUNL |
| 2 | **Consultant** | NA |
| 3 | **Project Title** | Restoration of Electrostatic Precipitator for Pass-B at 250 MW Unit-4 CTPP, Chhabra RVUNL |
| 4 | **Project Site Location** | Chhabra Thermal Power Plant is located near village Chowki Motipura in Tehsil Chabbra, Distt. Baran (Rajasthan) which is 22 Km from Chabbra Town ,10 Km from inter state border of Madya Pradesh, 147 Km from Kota. Plant site is well connected to State Highway-51 & located on Bina-Kota line of West Central Railway. |
| 5 | **Nearest Railway Station** | The nearest railway station is Chowki Motipura |
| 6 | **Nearest Airport** | The nearest commercial airport is Bhopal at about 220 km by road |
| 7 | **Nearest Highway** | State Highway-51 |

**Note: - The bidder is advised to visit and examine the site of WORKS and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into the CONTRACT. All costs for and associated with site visits shall be borne by the bidder.**

| | |
|---|---|
| **2.0** | **SCOPE OF WORK** |
| 2.1 | BHEL has been awarded the work of Restoration of Electrostatic Precipitator for Pass-B at 250 MW Unit-4 CTPP, Chhabra RVUNL. |
| 2.2 | Scope of these specifications cover complete work of handling, transportation of materials from RRVUNL storage yard / stores to erection site / place of erection , storage at erection site, preservation, watch and ward, dismantling of existing ESP Foundations, construction of New ESP Foundation, dressing, chipping & leveling of foundations, cleaning , checking, testing, pre-assembly, erection, calibration, alignment, grouting, welding, DPT wherever required, preservative/ painting including supply of paints, earthing(above and below ground) , etc., including other activities required for erection, testing, commissioning, post commissioning, trial operations & handing over of ESP covered within the scope of these specifications for Pass-B Unit-4 250MW Chhabra RVUNL of following system.<br>**A. Civil Works:**<br>**The brief scope of work is as follows:**<br>1. Dismantling of existing ESP foundation, cable trestle Foundation, floor, grade slab etc of pass B unit #4.<br>2. Preparation of new foundations of pass B unit #4.<br>3. Below ground earthling and earth pits of pass B unit #4 including supply of all earthing related material.<br>4. Disposal of excavated material with in plant premises with in a lead of 2 to 5 km as per the direction of engineer incharge.<br>5. Supply of all material i.e. cement , aggregate, sand, TMT etc. for completion of all civil work is in contractor scope.<br>6. All T & P required for civil work is in contractor scope.<br>7. This is R & M project and existing facilities( ESP Pass A, control room, duct , etc.) are available all around the work area so earth protection to be provided during excavation/concreting and removal for the same as per item no 101 A of civil BOQ.<br><br>The above provided scope of work is indicative only for the bidder's guideline. Any other civil work not mentioned above, but required for completion of the project in total, deemed to have been included in the bidder scope under this contract. Such work will be executed under this contract by bidder as per the direction of Engineer in charge. |

| | |
|---|---|
| | **B. ESP work:**<br>1. Erection, Testing and commissioning of ESP Pass-B.<br>2. Supply and application of Paint as per BHEL Specification.<br>3. Cable Laying, Dressing, ferruling, tagging and Termination between different equipment/instrument/PLC panel/EC Panel/MCC Panel/Service Transformer/HVR etc. of ESP Pass-B Unit-4.<br>4. Earthing Above Ground.<br>5. Conductance of ATT test.<br>6. Electrical Charging and Flue gas charging. |
| **2.3** | **This contract scope broadly consists of following works as described below but not limited to following:** |
| 2.3.1 | Contractor shall take delivery of item, materials, from the storage yard / stores/ sheds of customer which are within plant premises after getting approval of engineer / customer in the prescribed indent forms of BHEL / customer. Contractor shall make arrangements for, safe custody, watch and ward of equipment after it has been issued to him till they are fully erected, tested and commissioned till the contract period. The contractor shall note that items/materials shall be transported to erection site / assembly yard etc. by the prescribed route without disturbing and causing damage to other works in the most professional manner. All items, Hardware, etc. shall be stored in appropriate manner as per BHEL's instructions. |
| 2.3.3 | All the erection material is stored at Chhabra site premises. The contractor has to plan his material shifting in a way that there is no delay in shifting of material and the E&C is carried out as per planned monthly/weekly/daily program. |
| 2.3.4 | The storage yard is located within the plant boundary. ODC consignments will be unloaded near to erection site as per the space availability. Some other materials may also be unloaded near to erection site as per space availability. All other materials have to be transported from storage yard to construction area by the contractor at his own cost. |
| 2.3.5 | Any T&P's, Cranes, Slings, D-shackles and other lifting tackles, Trailers required for shifting of material from store to site shall be arranged by contractor. The contractor has to arrange for trailers (Low Bed and normal) of required capacity for shifting of the material from stores, yard and any other place of unloading of material/equipment. |

| | |
|---|---|
| 2.3.6 | For all material required to be erected in this contract scope, unloading of material at site is in the scope of this contract. Accordingly, all arrangements are to be made by the contractor. |
| 2.3.7 | Items stored outdoors shall be stored in such a way that item is at least six inches (6") above the ground.<br>Motors, valves, electrical equipment, control equipment and instruments etc. shall be stored indoors in warehouse safe keeping, watch and ward at site. |
| 2.3.8 | Preservation, safe keeping, watch and ward of the material at site. |
| 2.3.9 | Contractor shall ensure safe supply of material which is under their scope and Transit Insurance of supplied material by Contractor shall be their responsibility.<br>Insurance of Manpower engaged by Contractor shall be Contractor's scope. |
| 2.3.10 | Quality Assurance Plan (QAP) shall be provided to Contractor by BHEL. All the supplies and execution shall be as per QAP. |
| 2.3.11 | Pre-dispatch inspection/ clearance shall be obtained by contractor as per specification/ drawing and QAP approved by BHEL/RVUNL for all the items. |
| 2.3.12 | Pre-assembly, erection, alignment of various equipment's, machining and grouting. |
| 2.3.13 | Contractor shall calibrate, erect, commission all the equipment's, cabinets/panels, instruments and cabling etc. as per sequence prescribed by BHEL at site. The sequence of erection / commissioning methodology will be decided by the BHEL engineers depending upon the availability of materials/work fronts etc. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection / commissioning adopted in erection / commissioning of similar jobs or for any reasons whatsoever. |
| 2.3.14 | Contractor shall, transport all materials to site and unload at site / working area for inspection and checking. All material handling equipment required shall be arranged by the contractor. |
| 2.3.15 | Hydraulic testing, air/gas leak test, air tightness test, other pre commissioning tests as per approved quality plan/drawings/ documents. |
| 2.3.16 | Insulation and finish painting including supply of paints etc. |
| 2.3.17 | The customer will depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works, without any cost implications to the BHEL. Any defect in quality of work or deviations from drawings / specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL Engineer, without any cost implication to BHEL. |
| 2.3.18 | After completing all the works, contractor shall hand over all remaining extra materials with proper identification tags in a packed condition to RVUNL stores. In |

| | |
|---|---|
| | case of any use over actual design requirements, BHEL reserves the right to recover the cost of material used in excess or misused. Decision of BHEL engineer in this regard will be final and binding on the contractor. |
| **2.3.19** | **WELDING, NON-DESTRUCTIVE TESTING ETC** |
| **2.3.19.1** | Installation of equipment involves good quality welding, NDE checks etc. |
| **2.3.19.2** | Welding of all structural steel shall be done only by the qualified and approved welders. |
| **2.3.19.3** | All the welders shall be tested and approved by BHEL engineer/ Customer's quality engineer before they are actually engaged on work though they may possess IBR/other certificate. BHEL reserves the right to reject any welder without assigning any reason. |
| **2.3.19.4** | The welded surface shall be cleaned of slag and painted with primer paint to prevent corrosion. For this paint will be supplied by the contractor. |
| **2.3.19.5** | Welding electrodes have to be stored in enclosures having temperature and humidity control arrangement. This enclosure shall meet BHEL specifications. |
| **2.3.19.6** | Certain types of coated welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the coated welding electrodes have to be carried in portable ovens. |
| **2.3.20** | **SCAFFOLDING** |
| **2.3.20.1** | Contractor shall arrange scaffolding material or other materials required to create temporary platform, supports etc. to complete the work. |
| **2.4** | **SITE VISIT** |
| 2.4.1 | Contractor should visit site and acquire full knowledge and information about site conditions. The bidder must visit site, to acquaint themselves with the conditions prevailing at site and in and around the plant premises, together with all statutory, obligatory, mandatory requirements of various authorities before submission of bid. |
| **2.5** | **DEWATERING** |
| 2.5.1 | The bidder shall, prior to submitting his tender for the work, visit and examine the site of works and its surroundings at his own expense, and obtain & satisfy themselves about the limit and extent of surface and subsurface water to be encountered during the performance of the work, and the requirement of drainage and pumping.<br>Contractor shall ensure at all times that the work area & approach/ access roads are free from accumulation of water, so that the materials are safe and the erection/ progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL |
| **2.6** | **Contractor shall ensure the following:** |

| | |
|---|---|
| 2.6.1 | Contractor has to maintain contact with local hospital having ambulance facility, scanning and other ultramodern medical facilities required during emergency. |
| 2.6.2 | Contractor has to ensure pre-employment medical check for all staff & workers. |
| 2.6.3 | Contractor has to ensure that adequate First Aid facilities at work site for emergency purpose. |
| **2.7** | **The contractor shall comply with following towards Social Accountability** |
| 2.7.1 | The contractor shall not employ any employee less than 18 years of age in pursuant to ILO convention. If any child labour were found to have been engaged, the Contractor shall be levied with expenses of bearing his education expenditure which will include stipend to substantiate appropriate education or employ any other member of family enabling to bear the child education expenditure. |
| 2.7.2 | The contractor shall not engage Forced/ Bonded Labour and shall abide by abolition of Bonded Labour System (Abolition) Act, 1976. |
| 2.7.3 | The contractor shall maintain Health & safety requirement as stipulated in the Contract and Contract Labour (Regulation & Abolition) Act, 1970. |
| 2.7.4 | The Contractor shall abide by UN convention w.r.t. Human Rights and shall be liable for Discrimation / Corporal punishment for failure in meeting with relevant requirements. |
| 2.7.5 | The Contractor shall abide the requirement of Contract Labour (Regulation & Abolition) Act, 1970 for working hours. |
| 2.7.6 | The Contractor shall abide by the Statutory requirement of Minimum Wages Act 1948, payment of Wages Act 1936. |
| 2.7.7 | The Contractor shall arrange potable drinking water to its employees & workers. |
| 2.7.8 | **TRAINING OF WORK FORCE**<br>The contractor shall arrange induction safety training for all employees before assigning work. In addition, awareness programme, mock drill at regular intervals and daily tool box meetings shall be arranged. Monthly report of the above to be given to BHEL safety Officer as per prescribed BHEL formats.<br>All the contractor's supervisory personnel and sufficient number of workers shall be trained for fire protection systems. Enough number of such trained personnel must be available during the tenure of contract. Contractor should nominate his supervisor to coordinate and implement the safety measures. |
| **2.8** | **SITE ORGANISATION** |
| 2.8.1 | The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/informed by BHEL:<br>1. Overall planning, monitoring & control. |

| | |
|---|---|
| | 2. Quality control and quality assurance.<br>3. Materials management.<br>4. Safety, fire & security.<br>5. Industrial relations and fulfilment of labour laws and other statutory obligations.<br>6. Sufficient qualified Electrical and C&I Engineer for cable termination to panel, PLC, DCS etc. |
| 2.8.2 | The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all times for smooth execution of the contract. This organization shall be reinforced from time to time, as required to make up for slippage from the schedule without any commercial implication to BHEL. The site organization shall be headed by a competent construction manager having sufficient authority to take decisions at site. |
| 2.8.3 | On award of contract, the contractor shall submit to BHEL site organization chart indicating the various levels of experts to be deployed on the job. BHEL reserves the right to reject or approve the list of personnel proposed by the Contractor. The persons, whose bio-data have been approved by BHEL, will have to be posted at site and deviations in this regard will not generally be permitted. |
| 2.8.4 | The contractor should also submit to BHEL for approval a list of construction equipment, erection tools, tackle etc. prior to commencement of site activities in consultation with BHEL. These tools & tackles shall not be removed from site without written permission of BHEL. |
| 2.8.5 | The organization chart for site should indicate the various levels of experts to be posted for supervision in the various fields in erection, commissioning etc. as applicable. For proper supervision of the work, the contractor shall ensure providing one qualified supervisor against deployment of 15 workmen. |
| 2.8.6 | Contractor to ensure services of qualified and experienced Diploma / Degree Civil, Mechanical and Electrical Engineer having experience in respective field with sufficient nos. as desired by site for complete period of contract completion. This shall be indicated separately in manpower deployment plan to be submitted by contractor. These Engineers shall be reporting directly to the BHEL Engineer for the main work.<br><br>All Supervisors/ Engineers shall have to be supported individually by all independent groups comprising of workers like electrician, technicians and helpers etc. and required T & P and IMTE's. |
| **2.9** | **ERECTION SCHEDULE** |

| | |
|---|---|
| 2.9.1 | Contractor shall submit within 3 days of LOA date, detailed program (L3 schedule) of Dismantling/ Supply/ construction / erection / commissioning along with matching resources T&P Deployment and manpower deployment schedule for approval to Site In-Charge/Project Manager-Noida. L3 schedule shall be the working level document demonstrating contractor's ability and methods of completing the work within the key milestones identified in the tender specification These program would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detailed monitoring. The Contractor shall also be involved along with the Customer/BHEL to tie up detailed resource mobilisation plan over the period of time of the contract matching with the performance targets. |
| 2.9.2 | The program would be jointly finalised by the site in-charge of the contractor with BHEL/Customer's project coordinator as well as the site planning representative. The erection program will also identify the sequential erectable tonnages. |
| 2.9.3 | Contractor shall submit daily work program based on above schedule. Deferment of above schedule is not acceptable. Contractor will adhere to schedule & augment resources to ensure completion as per schedule. |
| 2.9.4 | It is not the intent to specify herein all details of material. Any item related to this work not covered, but necessary to complete the system will be deemed to have been included in the scope of the work. |
| 2.9.5 | Contractor shall erect all items/materials etc. as per sequence prescribed by BHEL at site. BHEL engineer depending upon the availability of materials/work fronts etc will decide the sequence of erection/commissioning methodology. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection/commissioning adopted in erection/commissioning of similar job or for any reasons whatsoever. |
| 2.9.6 | Contractor shall co-ordinate and responsible for satisfactory testing, pre-commissioning, commissioning and trial run of the connected equipment under overall guidance of BHEL and shall locate any cause of malfunction and rectify the same for proper operation. Testing shall also include any additional tests, which the Engineer feels necessary because of site conditions and also to meet system specification. |
| 2.9.7 | After completing all the works, contractor shall hand over all remaining extra materials with proper identification tags in packed condition to RVUNL stores. In case of any use over actual design requirements, BHEL reserves the right to recover the cost of material used in excess or misused. Decision of BHEL engineer in this regard will be final and binding on the contractor. |
| 2.9.8 | Overhauling, cleaning, revisioning, servicing of equipment’s (if required) during erection and commissioning stages will be arranged by the contractor. All equipment’s shall be preserved and protected before and after erection as per the |

| | |
|---|---|
| | advice of BHEL engineer. |
| 2.9.9 | Contractor shall retain all T&P/ Testing instrument/ Material handling instrument etc. at site as per advice of BHEL engineer and same shall be taken out from site only after getting the clearances from engineer in charge. |
| 2.9.10 | The contractor shall collect all scrap materials periodically from various levels of powerhouse, working area of the power station, auxiliary and piping around power station and collect the same at one place earmarked for the same. Loads of scraps are to be shifted to a place earmarked by BHEL. Failure to collect the scrap is likely to lead to accidents and as such, BHEL reserves the right to collect and remove the scrap at contractor's risk and cost, if there is any failure on the part of contractor in this respect**.** |
| 2.9.11 | Contractor at his cost shall arrange necessary security measures for adequate protection of his machinery, equipment, tools, materials etc. BHEL shall not be responsible for any loss or damage to the contractor's construction equipment and materials. The contractor may consult the Engineer-in-Charge on the arrangements made for general site security for protection of his machinery equipment tools etc. |
| 2.9.12 | Scope of work covered under this specification requires quality workmanship, engineering and construction management. The contractor shall ensure timely completion of work. The contractor shall have adequate tools, measuring instruments, calibrating equipment etc. in his possession. He shall also have adequate trained, qualified and experienced engineers, supervisory staff and skilled personnel. The manpower deployed by contractor shall match with above scope of works. |
| 2.9.13 | All the surplus, damaged, unused materials, package materials, containers, special transporting frames, etc. shall be returned to the BHEL stores / customer's stores by the contractor. |
| 2.9.14 | Bidder shall note that as the place of work is inside the plant and being manned by CISF or Security Forces of CUSTOMER, all necessary system related to entry of men, vehicle, material, safety & security systems, work permit system etc. as applicable will have to be followed by the contractor. CONTRACTOR shall abide by all safety regulations of the plant. The work shall be carried out inside the plant as per safety practices enforced by CUSTOMER's/ BHEL's safety section and instructions of Engineer-in-charge issued from time to time. |

| Sl.No. | Description | Scope / to be taken care by | | Remarks |
|---|---|---|---|---|
| | | **BHEL** | **Bidder** | |
| 3.0 | **ESTABLISHMENT** | | | |
| 3.1 | **FOR CONSTRUCTION PURPOSE:** | | | |
| 3.1.1 | Open space for office | Yes | | BHEL may provide free of charge limited open space for office and store as and where made available by the customer. |
| 3.1.2 | Open space for storage | Yes | | |
| 3.1.3 | Construction of bidder's office, canteen and storage building including supply of materials and other services | | Yes | |
| 3.1.4 | Bidder's all office equipment, office / store / canteen consumables | | Yes | |
| 3.1.5 | Canteen facilities for the bidder's staff, supervisors and engineers etc. | | Yes | |
| 3.1.6 | Firefighting equipment like buckets, extinguishers etc. | | Yes | |
| 3.1.7 | Fencing of storage area, office, canteen etc. of the bidder | | Yes | |
| 3.2 | **FOR LIVING PURPOSES OF THE BIDDER** | | | |
| 3.2.1 | Open space | | Yes | Bidder has to make his own arrangement at his own cost |
| 3.2.2 | Living accommodation | | Yes | |
| 3.3 | **ELECTRICITY** | | | |
| 3.3.1 | **Electricity For construction purposes** | Yes | | Construction Power will be provided at |

| Sl.No. | Description | Scope / to be taken care by | | Remarks |
|---|---|---|---|---|
| | | BHEL | Bidder | |
| 3.3.1.1 | Single Point source | Yes | | single point free of cost as and where made available by Owner, however contractor has to deploy DG Sets at no extra cost to BHEL to meet power requirement in case of delay in availability of single source or any kind of power interruptions during the course of the project. |
| 3.3.1.2 | Further distribution for the work to be done which include supply of all materials, energy meter, protection devices and its execution& service | | Yes | |
| 3.3.1.3 | Duties and deposits including statutory clearances if applicable | | Yes | |
| 3.3.2 | **Electricity for the office, stores, canteen etc. of the bidder, which include:** | | Yes | |
| 3.3.2.1 | Distribution from single point including supply of materials and service | | Yes | |
| 3.3.2.2 | Supply, installation and connection of material of energy meter including operation and maintenance | | Yes | |

| Sl.No. | Description | Scope / to be taken care by | | Remarks |
|---|---|---|---|---|
| | | **BHEL** | **Bidder** | |
| 3.3.2.3 | Duties and deposits including statutory clearances for the above | | Yes | |
| 3.3.2.4 | Living facilities for office use including charges | | Yes | |
| 3.3.2.5 | Demobilization of the facilities after completion of works | | Yes | |
| 3.3.3 | Electricity for living accommodation of the bidder's staff, engineers, supervisors etc. on the above lines. | | Yes | |
| 3.4.0 | WATER SUPPLY | | | |
| 3.4.1 | For construction purposes: | | | |
| 3.4.1.1 | Making the water available at single point | **Yes** | | Construction Water may be made available at single point source, as per availability. However Bidder has to ensure an alternate arrangement for construction water at his own cost by resorting to the methods water tankers etc. |
| 3.4.1.2 | Further distribution as per the requirement of work including supply of materials and execution | | Yes | |
| 3.4.2 | Water supply for bidder's office, stores, canteen etc. | | Yes | |
| 3.4.2.1 | Making the water available at single point | | Yes | |

| Sl.No. | Description | Scope / to be taken care by | | Remarks |
|---|---|---|---|---|
| | | BHEL | Bidder | |
| 3.4.2.2 | Further distribution as per the requirement of work including supply of materials and execution | | Yes | |
| 3.5.0 | **LIGHTING** | | | |
| 3.5.1 | For construction work (supply of all the necessary materials)<br>1. At office storage area<br>2. At the preassembly area<br>3. At the construction site /area | | Yes | |
| 3.5.2 | For construction work (execution of the lighting work/ arrangements )<br>1. At office storage area<br>2. At the preassembly area<br>3. At the construction site /area | | Yes | |
| 3.5.3 | Providing the necessary consumables like bulbs, switches, etc. during the course of construction | | Yes | |
| 3.5.4 | Lighting for the living purposes of the bidder at the colony / quarters | | Yes | |
| 3.6.0 | **COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER** | | | |
| 3.6.1 | Telephone, internet, intranet, e-mail etc. | | Yes | |
| 3.7.0 | **COMPRESSED AIR SUPPLY** | | | |
| 3.7.1 | Supply of Compressor and all other equipment required for compressor and compressed air system including pipes, valves, storage systems etc. | | Yes | |

| Sl.No. | Description | Scope / to be taken care by | | Remarks |
|---|---|---|---|---|
| | | **BHEL** | **Bidder** | |
| 3.7.2 | Installation of the above system and operation and maintenance of the same. | | Yes | |
| 3.7.3 | Supply of the all the consumables for the above system during the contract period | | Yes | |
| **3.8** | **CONSTRUCTION FACILITIES** | | | |
| 3.8.0 | Engineering works for construction: | | | |
| 3.8.1 | Providing the construction drawings for all the works covered under this scope | Yes | | |
| 3.8.2 | Drawings for construction methods and detailed shop drawings | Yes | Yes | In consultation with BHEL. Drawings for construction methods and detailed drawings shall be prepared by the Contractor as specified in the BOQ. |
| 3.8.3 | As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site– routing of small bore pipes | | Yes | In consultation with BHEL |
| 3.8.4 | Shipping lists etc. for reference and planning the activities | Yes | | ” |
| 3.8.5 | Preparation of site construction schedules and other input requirements | | Yes | ” |

| Sl.No. | Description | Scope / to be taken care by | | Remarks |
|---|---|---|---|---|
| | | BHEL | Bidder | |
| 3.8.6 | Review of performance and revision of site construction schedules in order to achieve the end dates and other commitments | Yes | Yes | ” |
| 3.8.7 | Weekly construction schedules based on Sl. No 3.8.5 | | Yes | ” |
| 3.8.8 | Daily construction / work plan based on Sl. No 3.8.7 | | Yes | ” |
| 3.8.9 | Periodic visit of the senior official of the bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months. | | Yes | |

| | |
|---|---|
| 3.9 | **Other important Conditions regarding facilities to be provided by BHEL / Contractor i.e. Space, Construction Power and Construction Water etc.:** |
| 3.9.1 | BHEL may provide free of charge limited open space, for office & storage shed, as and where made available by Customer .It is the responsibility of the contractor to construct sheds, establish batching plant, provide all utilities and dismantle and clear the site after completion of work or as and when required, as a part of his scope of work. |
| 3.9.2 | Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him. |
| 3.9.3 | **Construction power, for construction purposes will be provided free of cost by customer (RRVUNL)** at one point near erection site, from supply point **AS AND WHEN IT IS MADE AVAILABLE BY THE CUSTOMER** . In the initial stages, the Contractor may have to deploy the DG sets for carrying out the tender works. Further distribution of power (when received) shall be done by contractor at his cost. All wiring must comply with local regulations and will be subject to Engineer’s inspection and approval before connecting supply. |

| | |
|---|---|
| 3.9.4 | Provision of distribution lines of power and water from the central points to the required place with proper distribution boards observing the safety rules laid down by the authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch boards, TPN, CBS, ELCBS/ MCCBS / Copper / Brass clamps, copper conductor, change over switches, pipes, fittings etc. at his own cost. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shift / hours accordingly and deploy additional manpower if necessary so as to achieve the targets. Any duty, deposit involved in getting the Electricity shall be borne by the bidder. |
| 3.9.5 | In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor. During interruptions in regular power supply, power cut/load shedding in any construction sites, contractor should make his own arrangement for alternative source of power supply through deployment of adequate number of DG sets at their cost during the power breakdown /failure to get urgent and important work to go on without interruptions. No separate payment shall be made for this contingency |
| 3.9.6 | Adequate lighting facilities such as flood lamps, hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor's material storage area etc. within finally accepted rates. |
| 3.9.7 | To meet the project schedule , contractor has to arrange for construction water by water tankers etc . In case of interruption of supply form customer side within the quoted rates. |
| 3.9.8 | No claim for damages will be entertained by the Company on account of interruptions of water supply or limitation of quantity of water as aforesaid or on account of the water so taken being not fit for construction purposes or on any other account in connection with such water supply. |
| 3.9.9 | The Contractor should make arrangements for storage of sufficient quantity of water required for work. |
| 3.9.10 | The Contractor shall during the progress of the work, provide, erect and maintain at his own expenses all necessary temporary workshops, stores, consumables, offices, etc. required for the proper and efficient execution of the work. The planning, setting and erection of these buildings shall have the approval of the Engineer and the Contractor shall at all times keep them tidy and in a clean and sanitary condition to the entire satisfaction of the Engineer. |
| 3.9.11 | On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and levelled and debris shall be removed as per instruction of BHEL by the contractor at his cost. In the event of his failure to do so, same will be got done by the Engineer and expenses incurred shall be recovered from the contractor along with prevailing overhead. The decision of BHEL Engineer in this regard shall be final. |
| 3.9.12 | **DRINKING WATER** – Potable water is available in the plant. However , bidder may arrange for their workers, if required |
| 3.9.13 | **CONSUMABLES**<br>All consumables, like gas, electrodes, chemicals, lubricants, etc. required for the scope |

| | |
|---|---|
| | of work, shall be arranged by the contractor at his cost unless otherwise specifically mentioned in the contract.<br>In the event of failure of contractor to bring necessary and sufficient consumables, BHEL may arrange for the same at the risk and cost of the contractor. The entire cost towards this along with overhead shall be paid by the contractor or deducted from the contractor's bills. |
| 3.10 | **The following facilities will have to be arranged by contractor during entire period of contract including time extension if any within the contract price.**<br><br>**a. Computer- 1No along with all accessories including UPS.**<br>**b. Printer cum Scanner cum copier- 1 No.**<br>**c. Internet connection: 1 connection for BHEL site office and 1 connection for BHEL Transit flat.**<br>**d. Office Stationary: as required.**<br>**e. Office Boy- 1 person per shift (450 Mandays).**<br>**f. Cook- 1 No for BHEL staff mess (450 Mandays).**<br>**g. Utensils and Gas for BHEL Mess: As per requirement.**<br>**f. Water purifier for Mess: 01 No.**<br><br>If mandays are less consumed so recovery at the rate of minimum skilled wage rate in work completion month (Flue gas charging) shall be done.<br>If contractor does not provide above listed manpower/facilities on BHEL request then the recovery shall be made at the rate of prevailing hiring rates by BHEL with 5% overheads. |

# Chapter IV: T&PS AND MMES TO BE DEPLOYED BY CONTRACTOR

**(A) - LIST OF T & Ps TO BE ARRANGED BY THE CONTRACTOR AT HIS OWN COST:**

The following indicative major Tools & Plants (T&P) shall be arranged by the Contractor for execution work, within the quoted rate.

| Sl. No. | EQUIPMENT | INDICATIVE QUANTITY |
|---|---|---|
| **1.** | TOWER CRANE OF 6 MT OR HIGHER CAPACITY | 1 NO |
| **2.** | HYDRA CRANE 12T/14T/18T | 1 NO |
| **3.** | CRANE, TYRE MOUNTED TELESCOPIC BOOM HYDRAULIC CRANE (90/100 MT OR HIGHER CAPACITY AS PER REQUIREMENT) | 1 NO |
| **4.** | TRANSIT MIXER WITH MATCHING DUMPERS | 1 NO |
| **5.** | BATCHING PLANT / FLORI | 1 NO |
| **6.** | TRAILER 15T/20T | 1 NO |
| **7.** | DE WATERING PUMP | 2 NOS |
| **8.** | REINFORCEMET CUTTING / BENDING MACHINE | 2 NOS. |
| **9.** | PORTABLE LIGHTING MAST / LIGHTING SYSTEM | 1 NOS. |
| **10.** | CONCRETE MIXTURE M/C | APR* |
| **11.** | CONCRETE VIBRATORS | APR* |
| **12.** | WELDING MACHINES | APR* |
| **13.** | EXCAVATORS | APR* |
| **14.** | JACK HAMMER/HILTI MACHINE | APR* |
| **15.** | ALL SCAFFOLDING MATERIALS | APR* |
| **16.** | PIPE SCAFFOLDING, CLAMPS / SWIVEL COUPLERS (ONE/TWO WAY), PROPS, JACKS, SCREW HEADS, MS PIPES, WOODEN BATTENS, PLANKS, BULLIES, H FRAMES, TIE RODS WITH NUTS, ADJUSTABLE ACHRO SPAN (CONSIDERING INDIVIDUAL AREAS) | APR* |
| **17.** | HYD EXCAVATORS / POCLAINS / JCB | APR* |
| **18.** | DUMPERS | APR* |
| **19.** | DOZERS | APR* |
| **20.** | AIR COMPRESSOR | APR* |
| **21.** | WATER TANKER WITH SPRINKLER | APR* |
| **22.** | CONCRETE BREAKER | APR* |
| **23.** | WAGON DRILL MACHINE | APR* |

| | | |
|---|---|---|
| **24.** | HUCK-BOLTING MACHINES | APR* |
| **25.** | OIL CENTRIFUGING MACHINE | APR* |
| **26.** | WINCHES | APR* |
| **27.** | CHAIN PULLEY BLOCKS AND PULLEYS FOR SUITABLE CAPACITIES | APR* |
| **28.** | COARSE AGGREGATE SIEVES & SAND SIEVES | APR* |
| **29.** | CONCRETE CUBE MOULD (150MM X 150MM X 150MM) | APR* |
| **30.** | CONCRETE SLUMP CONE | APR* |
| **31.** | COMPRESSION STRENGTH TESTING EQUIPMENT | APR* |
| **32.** | CONSTRUCTION MATERIAL TEST EQUIPMENT | APR* |
| **33.** | PLUMB BOBS | APR* |
| **34.** | MEASURING TAPE | APR* |
| **35.** | TRANSFORMER OIL PURIFICATION PLANT WITH VACUUM PUMP FOR EVACUATION TRANSFORMER ALONGWITH ACCESSORIES & HOSES.<br>A) CAPACITY 750/1000/6000 LTR. PER HOUR | APR* |
| **36.** | TRANSFORMER OIL BDV TEST KIT 0-100 KV WITH 2.5MM AIR GAP. | APR* |
| **37.** | WELDING SETS WITH ACCESSORIES AND OVENS FOR WELDING ELECTRODES BACKING AND HOLDING | APR* |
| **38.** | TAP SETS FOR BOTH BSP AND NPT THREADS UPTO 1” EACH | APR* |
| **39.** | CRIMPING TOOLS UP TO ALL SIZE OF CABLES UNDER SCOPE OF WORK | APR* |
| **40.** | HYDRAULIC CRIMPING TOOL | APR* |
| **41.** | VACUUM CLEANER (INDUSTRIAL) | APR* |
| **42.** | GRINDING MACHINE | APR* |
| **43.** | DRILLING MACHINES | APR* |
| **44.** | ELECTRIC WINCHES | APR* |
| **45.** | PHASE SEQUENCE INDICATOR | APR* |
| **46.** | DIGITAL MULTIMETERS 3½ DIGIT OF REPUTED MAKE | APR* |
| **47.** | DIGITAL,6 ½, 41/2 DIGIT MOTWANE/HIL/FLUKE | APR* |
| **48.** | ANALOG MULTIMETERS | APR* |
| **49.** | 250V/500V/1000/5000V RATED HAND OPERATED MEGGER MAINS/BATTERY OPERATED | APR* |
| **50.** | DIGITAL MEGGER | APR* |
| **51.** | INSULATION TESTER MAINS OPERATED 2500/5000V | APR* |

| | | |
|---|---|---|
| **52.** | EARTH RESISTANCE TESTER | APR* |
| **53.** | TONG TESTERS AC 5/10,25/60/300 ,AMP RANGE ,OF REPUTED MAKE | APR* |
| **54.** | TONG TESTERS DC 30/60/300 A | APR* |
| **55.** | TORQUE WRENCH(12-60 NM,50-225 NM) | APR* |
| **56.** | ALCO METER FOR PAINT THICKNESS CHECKING | APR* |
| **57.** | FERRULE PRINTING MACHINE | APR* |
| **58.** | DIAL GAUGES | APR* |
| **59.** | INCLINED MANOMETER (+/-) 300 MM WATER COLUMN | APR* |
| **60.** | THREE PHASE DISTRIBUTION BOARD WITH COMPLETE SETUP FOR DRAWL & DISTRIBUTION OF CONSTRUCTION POWER | APR* |
| **61.** | ELECTRIC CABLES FOR DRAWL & DISTRIBUTION OF CONSTRUCTION POWER, HEATING MACHINES | APR* |
| **62.** | TRANSFORMER TURNS RATIO TEST KIT | APR* |
| **63.** | CONTAINER FOR TRANSFORMER OIL SAMPLING | APR* |
| **64.** | MEASURING INSTRUMENTS LIKE MICROMETRES AND CALIPERS | APR* |
| **65.** | TIG/MIG WELDING SET | APR* |
| **66.** | MECHANICAL TOOL KIT FOR FITTERS | APR* |
| **67.** | ELECTRICIAN TOOL KIT | APR* |
| **68.** | SAFETY BELTS AND SAFETY HELMETS | APR* |
| **69.** | HYDRAULIC JACKS 250T CAPACITY/100T | APR* |
| **70.** | CABLE ROLLERS | APR* |
| **71.** | TARPOLIN FIRE PROOF | APR* |
| **72.** | SCAFFOLDING MATERIAL | APR* |
| **73.** | REINFORCEMENT BENDING AND CUTTING MACHINE | APR* |
| **74.** | PLY SHUTTERING/ STEEL SHUTTERING BOARD WITH SUPPORT STRUCTURE | APR* |
| **75.** | U TUBE MANOMETER 0-2000 MM WATER COLUMN | APR* |
| **76.** | INCLINED MANOMETER 0-50 MM WATER COLUMN | APR* |
| Other than the aforesaid, one computer, printer and other necessary peripherals will have to be maintained by the contractor in his site office. | | |

**APR*: As per Requirement (Contractor shall have to deploy the T&P whenever required at site as decided by BHEL Engineer).**

**NOTEs:**

1. The above list – ( A ) is only indicative and these T&Ps may not be required for entire contract period but contractor will ensure that these T & Ps are provided as per the work requirement. **T&P Deployment schedule will be finalized at site based on the work fronts and in consultation with BHEL Engineer. Contractor have to mobilize / maintain the T& P as per the schedule notified time to time by BHEL Engineer.**

2. If any one of T&P mentioned above is not needed for proper execution of scope of work, provided contractor has not utilized BHEL free issued T&P for completing such work, no recovery from contractor shall be applicable.

3. Any additional item required in addition to above mentioned T&P for proper execution of scope of work, contractor has to arrange such T&P within quoted rate on the instruction of BHEL in writing in a reasonable period within two weeks from the written instruction from BHEL.
4. In case deployment of T&P w.r.t requirement, is delayed or deployed for a shorter period or abnormal down time of T&P or in case T&P w.r.t requirement was not deployed by the contractor as per instruction of BHEL and BHEL had to deploy either its own T&P or from outside, the recovery shall be done from the contractor as under:

    a. In case BHEL had to deploy its own T&P, hire charges of T&P applicable for outside agencies as per extant guidelines for "Hire Charges on issue of Capital Tools & Plants" shall be recovered.

    b. In case BHEL had to deploy the T&P from outside, actual hiring cost plus applicable overheads shall be recovered.

    c. In case the contractor does not deploy or delays deployment or major T&P with reference to schedule specified or T&P deployed is out of service for continuous more than 5 days, BHEL will recover non-refundable penalty per day in the following manner-( This recovery shall also be applicable in case BHEL does not deploy its own T&Ps or not deployed hired T&Ps)

    In respect of each hydra/crane 12T/14T/18MT/20 MT- @ Rs 3000/- per day
    In respect of each trailer 20MT- @ Rs 2000/- per day
    In Respect of each Crane (Tower Crane/Tyre Mounted 90T/100 MT)- @ 4000/- per day

    For the daily recovery rate for other T&P/IMTEs BHEL Engineer decision shall be final and binding on the contractor

5. All the tools and tackles/measuring instruments shall be duly tested/calibrated and valid certificate to that effect should be submitted to BHEL site in-charge before the start of work.

6. Depending upon the nature of work and availability of facilities locally, contractor may have to arrange for a temporary workshop for facilitating uninterrupted progress of work.

7. Necessary electrical / water / air connection required for operation of any of the tools & tackles

shall be to Contractor's account.

8. The contractor shall arrange crane/trailer/dumper/batching plant operator, diesel, petrol and other consumables required for the tools and plants, equipments etc. Preventive and routine maintenance of T & P are also to be arranged by the contractor at his cost without any delay. Required number of experienced mechanics and helpers for routine maintenance of the above cranes shall be provided by the contractor within his quoted rate**.**

9. Other terms and conditions regarding above items please also refer clause for T&P/IMTEs in SCC.

10. All the tools and plants required for this scope of work, except the Tools & Plants provided by BHEL are to be arranged by the contractor within the quoted rates. The list is suggestive in nature. **Any additional T & P required to meet BHEL commitments/schedule shall be arranged without any extra cost by the contractor.**

11. If the work related to T & Ps mentioned above list - (A) is completed then, Engineer I / C can release the T & P during contract period / extended period if any. However, written permission shall be taken by contractor from BHEL construction Manager before releasing T&P.

B- LIST OF IMTEs/MMEs REQUIRED:

| SL NO | EQUIPMENT |
|---|---|
| 1 | TOTAL STATION |
| 2 | AUTO LEVEL AND STAFF |
| 3 | COMPRESSION STRENGTH TESTING EQUIPMENT |
| 4 | CONSTRUCTION MATERIAL TEST EQUIPMENT |
| 5 | CONCRETE CUBE MOULDS (150 X 150 X 150) mm |
| 6 | CONCRETE SLUMP CONE |
| 7 | COARSE AGGREGATE SIEVES & SAND SIEVER |
| 8 | SIEVES AND SIEVE SHAKER |
| 9 | AGGREGATE IMPACT TEST MACHINE |
| 10 | LE CHATELEIR'S APPROATUS AUTO CLAVE EQUIPMENT |
| 11 | LOS ANGLES ABRASION TESTING MACHINE |
| 12 | AGGREGATE CRUSHING VALUE APPRATUS |
| 13 | THICKNESS GAUGE FOR MEASURING FLAKINESS INDEX |
| 14 | ELONGATION GAUGE |
| 15 | PYCNOMETER (FOR SPECIFIC GRAVITY OF AGGREGATES) |
| 16 | MOTORISED VIBRATION MACHINE FOR CEMENT TESTING |
| 17 | PHYSICAL BALANCE FOR LAB WORK |
| 18 | RAPID MOISTURE METER |
| 19 | VICAT APPARATUS WITH PLUNGERS FOR CEMENT TESTING |

| | |
|---|---|
| 20 | TOTAL STATION |
| 21 | DUMPY LEVEL UP TO 350 MM |
| 22 | CORE CUTTER TEST APPARATUS |
| 23 | CUBE MOULDS (70MM SIZE) |
| **PROCESS CONTROL ACCESSORIES** | |
| 1 | HOT AIR OVEN (TEMPERATURE RANGE $50^0$ C TO $300^0$C) |
| 2 | ELECTRONIC BALANCE OF REQUIRED CAPACITY & SIZE |
| 3 | PHYSICAL BALALANCE OF REQUIRED CAPACITY & SIZE |
| 4 | THERMOMETRE (RANGE $0^0$C TO $150^0$C) |
| 5 | POKER THERMOMETER (CONCRETE ROAD) OF REQUIRED RANGE |
| 6 | MEASURING JARS (100ml, 200ml, 500ml & 1000ml) |
| 7 | DIGITAL pH METER |
| 8 | DIGITAL MICROMETER |

**NOTES:**

1. The above list is only indicative and these IMTEs/MMEs may not be required for entire contract period and will be provided as per need. Contractor will assess actual quantity and period of requirement based on his experience.

2. If any one of items mentioned above is not needed for proper execution of scope of work, provided contractor has not utilized BHEL free issued T&P for completing such work, no recovery from contractor shall be applicable.

3. Other terms and conditions regarding above items please also refer clause for T&P/MMEs.

4. The contractor has to establish / arrange at site the field-testing facilities for testing of civil construction materials and concrete cubes for ensuring the proper quality, grade and strength of the materials used in the construction in line with approved field quality checklist of BHEL/ its client. Contractor has to submit detailed report for testing of all material used etc. All testing shall be done as per IS code specifications/ BHEL's quality plan. If further test is required by the engineer to be carried from outside laboratory, the cost of the same shall be borne by the contractor.

**5.** All the IMTEs /MMEs required for this scope of work, except the IMTEs / MMEs provided by BHEL, are to be arranged by the contractor within the quoted rates. **The list is suggestive in nature. Any additional IMTEs / MMEs required to be arranged by the contractor.**

**The following materials/consumables are to be arranged by the contractor as part of the contractual scope**.

| S/N | Description |
|---|---|
| 1 | TMTs for RCC works. |

| | |
|---|---|
| 2 | Cement (PCC/OPC grade), Aggregate, Sand etc.. |
| 3 | Welding electrodes for welding. |
| 4 | Filler wire for argon welding. |
| 5 | Argon, oxygen and acetylene gas. |
| 6 | Provision for temporary scaffoldings. |
| 7 | GI "U" clamps with nuts and washers for impulse and GI pipe clamping(if required). |
| 8 | Round aluminium tags (30mm dia x 3mm thick). |
| 9 | Teflon tape and insulation tape. |
| 10 | Hold tight / bitumen tape for GI pipe coupling(if required). |
| 11 | Required paints and primer from BHEL approved make only. |
| 12 | Solder wire (60/40) |
| 13 | Protocol/calibration report sheets as per BHEL format. |
| 14 | Panel/JB sealing compound material (for cable entry from bottom/top of panel). |
| 15 | PVC cable tie, aluminium strip and hardware for clamping of cables, copper tube, and temperature gauge capillary. |
| 16 | Copper lugs upto 4 sqmm, PVC sleeve of different size, PVC button & tape. |
| 17 | Ferrules (PVC) and suitable for ferrule printing. |

| | | |
|---|---|---|
| **5.0** | **TIME SCHEDULE** | |
| 5.1 | The contractor is required to commence the work within **7 days** from the date of issue of letter of award (LOA) unless BHEL decides to fix any other later date. | |
| 5.2 | **START DATE / ZERO DATE**<br>The schedule date of start of work shall be the date after 7days of issue of LOA; The Actual Date of Start of Contract Period (Zero Date) shall be date of handing over of site to contractor for work and shall be certified by the BHEL Engineer. | |
| 5.3 | Entire work as detailed in the tender specifications shall be completed within **10 months** from the Zero date as per programme / milestones indicated by BHEL Engineer. Contractor has to mobilise adequate resources to meet BHEL‟s commitments to their customer as indicated from time to time. | |
| 5.4 | Entire work shall be carried out in accordance with the broad schedule for Civil/ESP works furnished below, within the stipulated completion period.<br>This schedule will undergo review on regular basis by customer and BHEL. Based on achieved progress vis-à-vis project requirement, contractor shall be provided with the revised Erection schedule by BHEL/ customer.<br>The contractor will have to submit a program for E&C to meet the revised project schedule and accordingly augment his manpower/T&P at no extra cost to BHEL. | |
| 5.5 | **Schedule of Work** | |
| | Milestone | Schedule |
| 5.5.1 | Start of work | Zero Date |
| 5.5.2 | Start of Civil Work | Zero Date |
| 5.5.3 | Dismantling of Existing ESP/Cable trestle Foundations and Preparation of New ESP Foundations | 100 Days |
| 5.5.4 | Start of Erection of ESP Parts | 101st Day |
| 5.5.5 | Completion of ESP Erection | 260th Day |
| 5.5.6 | Start of ATT | 261st Day |
| 5.5.7 | Completion of ATT and Flue Gas Charging | 280th Day |
| 5.5.8 | Completion of Trial Run, GD Test, material reconciliation, Area Cleaning and Punch Points | 300th Day |

## PRICE BID

| ITEM NO. | DESCRIPTION OF WORK | TOTAL VALUE (Z) IN INR (IN FIGURES AND WORDS) |
|---|---|---|
| 1.0 | **Lump sum price for entire scope of work against Dismantling of foundations, Civil works, Mechanical, Electrical and C&I Works of "RESTORATION OF ELECTROSTATIC PRECIPITATOR FOR PASS-B AT 250 MW UNIT-4 CTPP, CHHABRA RVUNL "** | **In Figure----------**<br>**In Words---------** |

**Notes:**

i. Bidder's quoted price as above shall be complete in all respect for the entire scope of work defined in TCC Part-I & TCC Part-II and in accordance with all the terms and conditions, schedules, specifications and drawings etc. forming part of the NIT/tender documents.

ii. Contractor shall fully understand description and specifications of items mentioned in BOQ.

iii. Conditional price bids with any deviation / clarification etc. are liable to be rejected. No cutting / erasing / over writing shall be done.

iv. Quantities mentioned in BOQ Cum Rate Schedule are approximate only and liable for variation on either side depending upon site / design requirement. The tentative contract value (CV) of entire scope of work shall be calculated as per finally quoted / accepted rates & the Quantities indicated in BOQ cum Rate Schedule.

v. Contractor's total quoted price as per BOQ Cum Rate Schedule will be taken as tentative only. The contractor undertakes to execute actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually executed at site and payments will also be regulated for the same.

vi. In case of any mis-match in rate and amount on price discrepancy, the same will be dealt as per clause no. 1.4 of GCC.

vii. Taxes (GST) shall be payable extra as per relevant clauses in Technical Conditions of Contract

## RATE SCHEDULE

| Sl No | Description of Work | QTY | UOM | Factor | Unit Rate (per MT/ LOT) = Factor (F) x Total Value (Z)/ 1000 (Rounded off up to two place of decimal) | Amount ( Rs.) = Unit Rate x QTY |
|---|---|---|---|---|---|---|
| A | **Civil Works:**<br>Dismantling of Existing ESP Pass-B Foundation and Construction of New Foundations.<br><br>BOQ of Civil Works as per Annexure-I. | 1 | Lot | 529.145129 | | |
| | | | | | | |
| B | **Mechanical, Electrical and C&I works of ESP Pass-B:**<br>Erection, Testing and Commissioning of ESP Pass-B.<br><br>Weight Schedule of ESP as per Annexure-II | 1910 | MT | 0.2465209 | | |

Note:

The Quantities indicated above are tentative and are liable to vary depending upon the site requirement. Payment shall be made on Pro-rata basis for actual quantities. The contractor has to supply/ erect/ commission all the items indicated by BHEL for achieving the milestone and completion of work.

| | |
|---|---|
| **7.0** | **TERMS OF PAYMENT:** |
| 7.1 | TERMS OF PAYMENT: |
| 7.2 | The 'Engineer' will certify regarding the actual work executed in the measurement books and bills, which shall be accepted by the contractor in measurement book. |
| 7.3 | Contractor shall submit bills for the work completed under the specification, **once in a month** detailing work done during the month. **The Contractor shall be paid monthly running bill as per Chapter-X of SCC and Clause Nos. 2.22 & 2.23 of GCC.** The format for billing shall be approved by BHEL before raising invoices. |
| 7.4 | The Contractor on certification of the engineer at site is entitle for payments for his running bills which shall be subject to any deduction / retention specially under clause no. 2.22 of GCC and 10.0 of SCC. |
| 7.5 | Payment of retention amount and final bill shall be as per clause No. 2.22 and 2.23.2 of GCC respectively. |
| 7.6 | Subject to any deduction that BHEL may be authorized to make under the contract, the contractor on the certificate of the Engineer at site be entitled for payment as explained hereunder. |
| 7.7 | **For Civil Works (Item No. A of Rate Schedule):**<br>a) As per **Annexure-1** (BOQ FOR CIVIL WORKS) on pro-rata basis. |
| 7.8 | **For Mechanical, Electrical and C&I works of ESP, Pass B, Unit#4 (Item No. B of Rate Schedule):**<br>a) 25% of Unit Rate on placement in position/Cable Laying and pre-alignment on pro-rata basis.<br>b) 35% of Unit Rate on placement in bolting/ fixing/ final alignment/Cable Dressing on pro-rata basis.<br>c) 25% of Unit Rate on placement in final welding/ Cable Termination as per drawing on pro-rata basis.<br>d) 3.0% of the Amount of Item No. **B** of rate schedule on successful completion of insulation work as per drawing/scope.<br>e) 3.0% of the Amount of Item No. **B** of rate schedule on supply of painting and completion of painting work.<br>f) 3.0% of the Amount of Item No. **B** of rate schedule on taking ESPs into circuit and after completion of trial run operation.<br>g) 3.0% of the Amount of Item No. **B** of rate schedule on successful completion of GD Test.<br>h) 3.0% of the Amount of Item No. **B** of rate schedule on successful completion of pending work i.e area cleaning, contractual obligation, material reconciliation etc.<br>**Note: Above payment at Sl. No. d), e), f), g) & h) shall be subjected to adjustment in Amount at Chapter VI, Sl. No. B based on actual tonnage handled/carried out on completion of total work.** |

| 8.0 | **MATERIALS** |
|---|---|
| 8.1 | The contractor shall at his own expenses provide all materials including consumables, welding electrodes etc. required for the work. |
| 8.2 | All materials to be provided by the Contractor shall be of the best kind in conformity with the specifications laid down in the contract or as per relevant Indian standard and the Contractor shall, if requested by the BHEL Engineer, furnish proof to the satisfaction of BHEL Engineer that the materials so comply. |
| 8.3 | The Contractor shall, at his own expense and without delay, supply to the BHEL Engineer, samples of materials (Civil) proposed to be used in the works. The BHEL Engineer shall within seven days of supply of samples or within such further period as he may require will intimate to the Contractor in writing, whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the BHEL Engineer for his approval fresh samples complying with the specifications laid down in the Contract. Any delay in approval of samples (original or fresh ones) shall not make the contractor eligible for any compensation. |
| 8.4 | The BHEL Engineer shall have full powers for removal of any or all of the materials brought to site by the Contractor which are not in accordance with the Contract specifications or do not conform in character or quality to samples approved by him. In case of default on the part of the Contractor in removing rejected materials, the BHEL Engineer shall be at liberty to have them removed by other means. The BHEL Engineer shall have full powers to procure other proper material to be substituted for rejected materials and in the event of the Contractor refusing to comply; he may cause the same to be supplied by other means. All costs, which may attend upon such removal and / or substitution, shall be borne by the Contractor. |
| 8.5 | The Contractor shall indemnify BHEL, its representatives or employees against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or material or part thereof included in the Contract. In the event of any claim being made or action being brought against BHEL or any agent, servant or employee of BHEL in respect of any such matters as aforesaid, the Contractor shall immediately be notified thereof, provided that such indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by BHEL but the Contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursed to the Contractor only if the use was the result of any drawings / specifications issued after submission of the tender. |
| 8.6 | The BHEL Engineer shall be entitled to have tests carried out as specified in the Contract for any materials supplied by the Contractor other than those for which, as stated above, satisfactory proof has already been furnished, at the cost of the Contractor and the Contractor shall provide at his expense all facilities which the Engineer may require for the purpose. If no tests are specified in the Contract, and such tests are required by BHEL Engineer, the Contractor shall provide all facilities required for the purpose and the charges for these tests shall be borne by the Contractor only. The cost of materials consumed in tests shall be borne by the Contractor in all cases except when otherwise provided. |
| 8.7 | In addition, the Contractor shall perform / submit at his own cost such tests / samples as |

| | |
|---|---|
| | may be required by the BHEL Engineer out of the materials used by the company except for the costs of materials used in such tests/ samples. |
| 8.8 | NIL |
| 8.9 | Material required for the works, whether brought by the Contractor or supplied by BHEL, shall be stored by the Contractor only at places approved by BHEL Engineer. Storage and safe custody of material shall be the responsibility of the contractor. |
| 8.10 | BHEL's officials concerned with the Contract shall be entitled at any time to inspect and examine any materials intended to be used in or on the works, either on the Site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or at any place (s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be required for such inspection and examination. |
| 8.11 | All materials brought to the Site shall become and remain the property of BHEL and shall not be removed off the Site without the prior written approval of the BHEL Engineer. But whenever the Works are finally completed and advance, if any, in respect of any such material is fully recovered, the Contractor shall at his own expense forthwith remove from the Site all surplus material originally supplied by him and upon such removal, the same shall re-vest in and become the property of the Contractor. |
| 8.12 | It shall be the responsibility of the contractor to obtain prior approval of BHEL, regarding suppliers, type of electrodes etc. before procurement of welding electrodes / TIG wires. On receipt of electrodes at site these shall be subjected to inspection and approval by BHEL. The contractor shall inform BHEL details regarding type of electrodes, batch No. date of expiry etc. and produce test certificate for each lot / batch with correlation of batch / lot no. with respective test certificate. No electrode will be allowed to be used without valid test certificate. |
| 8.13 | All charges on account of Octroi, terminal or sales tax and other duties on material obtained for the works from any source shall be borne by the contractor. |

| **9.1** | **EXECUTION OF WORK** |
|---|---|
| 9.1.1 | The work shall be executed in a workman like manner and to the entire satisfaction of the Engineer and as per technical specification issued with tender, IS codes, technical specifications as applicable. In case of conflict, the decision of the Engineer I/c shall be final & binding. |
| 9.1.2 | **The Engineer I/c will communicate or confirm his instructions to the Contractor in respect of the execution of the work in a "Work Site Order Book" maintained at his office and the Contractor shall visit this office daily and shall confirm receipt of such instructions by signing the relevant entries in this book or through e-mail. Such entries / e-mails will rank as order or notices in writing within the intent and meaning of these conditions.** |
| 9.1.3 | Only BHEL approved make of electrodes will be used. All electrodes shall be heated and dried in the electric electrode drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to site will have valid manufacturing test certificate. The test certificate will have co-relation with the lot no. / batch no. given on electrode packets. No electrodes will be allowed to be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved / accredited test house traceable to National / International standards) will be submitted to BHEL before putting the oven in use. Periodical calibration for the same shall also be arranged by the contractor within the finally accepted rates. |
| 9.1.4 | Contractor shall execute the work as per sequence and procedure prescribed by BHEL at site. The applicable erection manuals which are available with BHEL site office are to be referred for compliance and guidance before taking up the work. Any rework on this failure to comply with will be to account of contractor only. BHEL engineer, depending upon the availability of materials, fronts etc., will decide the sequence of erection and methodology. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the method of erection adopted in erection of similar jobs in other projects or for any reason whatsoever. |
| 9.1.5 | The work shall confirm to dimensions and tolerances specified in the various drawings / documents that will be provided during various stages of erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations due to Contractor's fault, the Contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by BHEL and recoveries will be effected from the Contractor's bills towards expenditure incurred including cost of materials and departmental overheads of BHEL as per GCC. |
| 9.1.6 | On completion of work, all the temporary buildings, structures, scaffolding, cables etc. shall be dismantled and levelled and debris shall be removed as per |

| | |
|---|---|
| | instructions of BHEL by the contractor at his cost. In the event of his failure to do so, the expenditure towards clearance of the same will be recovered from the contractor. The decision of BHEL Engineer in this regard is final. |
| **9.2** | **SETTING OUT** |
| 9.2.1 | All the works shall be set out to the true lines, grades and elevation indicated on the drawing. The contractor shall be responsible to locate and set out the works. Only one grid reference line and bench mark all be made available for setting out the works under the contract. This reference lines shall be used as datum for the works under the contract and the contractor has to establish for his work area at available points horizontal and vertical control points. The contractor shall inform BHEL well in advance of the times & places at which he wishes to do work in the area allotted to him so that suitable datum points established by him are checked by BHEL / Customer to enable the contractor to proceed with the works. Any work done without being properly located may be removed and / or dismantled by BHEL / Customer at contractor's expense. |
| 9.2.2 | The contractor shall at his own expense take all proper and responsible precautions to preserve and maintain these datum marks to its true position. In the event of these marks being disturbed or obliterated by accident or due to any other cause whatsoever, the same may be deemed necessary placed by BHEL / Customer at contractor's expenses. |
| **9.3** | **SITE DRAINAGE** |
| 9.3.1 | All water including sub-soil water which may accumulate on the Site during the progress of the works or in trenches and excavations, including monsoon period shall be removed by the contractor from the Site to the satisfaction of the Engineer. It will also be responsibility of the contractor to de-water all the foundation pits, trenches with suitable de-watering methods like, pumping out, well point system etc. considering the depth of water table at plant site. All such expenditure on de-watering shall be deemed to be included in quoted rates.<br>Vendor has to arrange and maintain adequate no. of Diesel & electrical pumps of suitable capacities, operators, necessary manpower with sufficient quantity of suction& discharges hoses, pipes, Clamps, cables, Electrical panels/starters, diesel, consumables without any extra commercial implication on BHEL treating as normal scope of work. Dewatering pumps will be required to run to ensure job progress is not hampered & if required pumps are to be run on round the clock basis on working days & holidays, Sundays. |
| **9.4** | **INSPECTION AND STAGE APPROVAL OF THE WORK** |
| 9.4.1 | The owner or his duly authorized representative shall have at all reasonable times access to the contractor's premises or works and shall have the power to inspect drawings or any portion of the work, examine the materials and workmanship and shall have the authority to reject any work. This would be implemented through joint inspection by the representative of the owner and BHEL and in the form of joint protocols without any extra claims and loss of time and amount. |
| 9.4.2 | All work embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice in writing to the Engineer when each stage is ready. In default of such notice being received, |

| | |
|---|---|
| | the Engineer shall be entitled to approve the quality and extent thereof at any time he may choose and in the event of any dispute, the decision of the Engineer thereon shall be final and conclusive. |
| **9.5** | **UNCOVERING AND MAKING GOOD** |
| 9.5.1 | The Contractor shall uncover any part of the Works and/or make openings in or through the same as the Engineer may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the Engineer. If any such part has been covered up or put out of view after being approved by the Engineer and is subsequently found on uncovering to be executed in accordance with the Contract, the expenses of uncovering and / or making opening in or through, reinstating and making good the same shall be borne by BHEL. In any other case all such expenses shall be borne by the Contractor. |
| **9.6** | **DISCREPANCIES AND ADJUSTMENT OF ERRORS** |
| 9.6.1 | The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small-scale drawings and figures dimensions in preference to scale and special conditions in preference to general conditions. |
| 9.6.2 | In case of discrepancies between schedules of quantities, the specification and / or the drawings, the following order of preference shall be observed.<br>(a) Description in schedule of quantities.<br>(b) Technical Conditions of Contract.<br>(c) Drawings.<br>(d) Technical Specifications<br>(e) Special Conditions of Contract<br>(f) General conditions of contract |
| 9.6.3 | If there are varying or conflicting provisions made in any one document forming part of the contract, the Engineer shall be the deciding authority with regard to the document. |
| 9.6.4 | Any error in description, quantity in schedule of quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to the drawings and specifications or from any of his obligations under the contract. |
| **9.7** | **MATERIAL OBTAINED FROM EXCAVATION** |
| 9.7.1 | Valuable Materials / Archeologically important materials of any kind obtained from excavation on the Site shall remain the property of BHEL / its client and shall be disposed of as the Engineer may direct, at no extra cost. |
| **9.8** | **SAFETY CODE** |
| **9.8.0** | **The contractor shall comply with following towards Safety and Social Accountability.** |

| | |
|---|---|
| 9.8.1 | Besides provision with regard to SAFETY under Clause 9.0 of SCC, the contractor will be responsible for Health, Safety & Environment management at site for the construction activities to be carried out by them. The contractor shall continuously take special care to ensure the safety and prevention of human and equipment accidents and maintain good sanitary conditions in and around the site. All the construction work and plant operation must be carried out in the safest possible manner. The Engineer reserves the right to stop any process which, in the Engineer's opinion, is being performed dangerously. In this case the contractor must immediately adhere the requisite safety precautions and any delays attributed to the work stoppage on this account shall not affect the agreed contractual finishing dates. |
| 9.8.2 | HSE plan for site operation by Sub Contractor (Doc No. HSEP 14 attached) shall be followed. |
| 9.8.3 | Contractor has to abide all the statutory guidelines issued by Government in respect of COVID-19. All the necessary PPEs or other facility required at site in respect of COVID-19 is to be arranged by the bidder within the quoted rates. |
| 9.8.4 | **Contractor shall make necessary arrangements to ensure following :**<br>• Contractor has to maintain contact with local hospital having ambulance facility, scanning & other ultra-modern medical facilities required during emergency.<br>• Contractor has to ensure pre-employment medical check for all staff & workers. |
| **9.8.5** | **EMERGENCY VEHICLE**: Contractor shall arrange / tie-up with nearest Hospital / Nursing Home to deal with any emergency situation including arrangement of ambulance as and when needed. |
| **9.9** | **NUISANCE** |
| 9.9.1 | The Contractor shall not at any time do, cause or permit any NUISANCE on Site or do anything which shall cause unnecessary disturbance or inconvenience to owners, tenants or occupiers of other properties near the Site and to the public generally. |
| **9.10** | **TREASURE , TROVE , FOSSILS etc.** |
| 9.10.1 | All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the absolute property of BHEL / BHEL's client and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such article or thing, shall immediately upon discovery thereof and before removal acquaint the Engineer with such discovery and carryout the Engineer's directions as to the disposal of the same. |
| **9.11** | **PROTECTION OF WORKS** |
| 9.11.1 | Trees designated by the Engineer shall be protected from damage during the course of the Works and earth level within 1 meter of each such tree shall not be charged. Where necessary, such trees shall be protected by providing temporary fencing. |
| 9.11.2 | The contractor shall provide and maintain at his own expense all lights, guards, |

| | |
|---|---|
| | fencing and watching when and where necessary or required by the Engineer for the protection of the Works or for the safety and convenience of those employed on the Works or the public. |
| 9.11.3 | The contractor shall have total responsibility for protecting his works till it is finally taken over by the Engineer. No claim will be entertained by the Engineer for any damage or loss to the contractor's works and the contractor shall be responsible for the complete restoration of the damaged works to its original condition to comply with the specifications and drawings. Should any such damage to the contractor's works occur because of other party not under his supervision or control, the contractor shall make his claim directly with the party concerned. The contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such disputes. The contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such disputes. |
| **9.12** | **RECORD FOR MATERIALS CONSUMED** |
| 9.12.1 | The contractor shall maintain and furnish to the Engineer the RECORD OF MATERIALS consumed in the works for each activity. The statement showing the theoretical vis-à-vis actual consumption of specified materials, such as structural /reinforcement steel, cement, bitumen, lead, paint etc., shall be enclosed along with the running bills submitted by the contractor. Contractor has to also furnish the test results of the materials used in the work as per IS specifications. |
| **9.13** | **PROTECTION OF EMBEDMENTS, BOLTS ETC.** |
| 9.13.1 | The contractor shall ensure proper protection to the satisfaction of the Engineer, of all bolts, inserts, embedment etc. from weather etc./ by greasing, rapping them with gunny bags or canvas or by any other means as directed by Engineer. Cost of such protections shall be deemed to be included in the rates quoted for the item. |
| **9.14** | **COMPLETION OF WORK AND COMMENCEMENT OF GURANNTEE PERIOD** |
| 9.14.1 | The works shall be completed to the entire satisfaction of the Engineer and in accordance with the completion schedule as specified in the Contract, and all unused stores and materials, tools, plant, equipment, temporary buildings, site office, labor hutments and other things shall be removed and the site and work cleared of rubbish and all waste materials and delivered up clean and tidy to the satisfaction of the Engineer at the Contractor's expenses. |
| 9.14.2 | BHEL shall have power to take over from the Contractor from time to time such sections of the work as have been completed to the satisfaction of the Engineer. Such work however shall not be treated as have been completed until the extra / pending works are executed to the satisfaction of Engineer. |
| 9.14.3 | The Engineer shall certify to the contractor the date on which the work is completed and the date thereof for commencement of Guarantee Period. |
| **9.15** | **CLEARANCE OF SITE AND REPAIRS.** |
| 9.15.1 | Contractor has to clear the site / area where mechanical and electrical erection work is to be commenced / or in progress. The contractor shall remove construction materials and equipment lying in the vicinity and causing obstruction in the erection work within 24 hrs notice. In case, he fails to clear the site, this will be done at his risk & cost by BHEL. |
| **9.16** | **QUALITY ASSURANCE** |

| | |
|---|---|
| **9.16.1** | The contractor has to establish / arrange at site the field-testing facilities for testing of civil construction materials and concrete cubes for ensuring the proper quality, grade and strength of the materials used in the construction in line with approved field quality checklist of BHEL/ its client. Contractor has to submit detailed report for testing of all material used etc. All testing shall be done as per IS code specifications/ BHEL's quality plan. If further test is required by the engineer to be carried from outside laboratory, the cost of the same shall be borne by the contractor. |
| **9.17** | **NIL** |
| **9.18** | **METHOD OF MEASUREMENT** |
| **9.18.1** | Method of measurements shall be as per standard specifications included in the tender. For other items measurements shall be as per relevant IS Codes. |
| **9.19** | **DEVIATION** |
| 9.19.1 | The Contractor shall not make any alteration in, addition to or omission from the work as described in the tender documents except in pursuance of the written instructions of the Engineer. No such deviation from the work described in the tender documents shall be valid unless the same has been specifically confirmed and accepted by the Engineer in writing and incorporated in the Contract. |
| 9.19.2 | The Engineer may deviate, either by way of addition or deduction, from the work so described, provided that the Contract sum be not thereby varied on the whole by more than the percentage set out in the tender documents. The value of all additions and deductions shall be added to or deducted from the Contract sum. (Whenever the Engineer intends to exercise such a right his intentions shall specify the deviations which are to be made, the lump-sum assessment or the proposed basis of payment, the extra time allowed, if any, and the date for completion of the entire contract). Any objection by the contractor to any matter concerning the order shall be notified by him in writing to the Engineer within seven days from the date of such order, but under no circumstances shall the work be stopped (unless so ordered by the Engineer) owing to differences or controversy that may arise from such an objection. In the absence of such a notification of objection by the Contractor, he will be deemed to have accepted the order and the conditions stated therein. |
| 9.19.3 | Valuation of Deviations shall be as per Clause 2.15 & 2.16 of GCC. |
| **9.20** | **COMPLIANCE TO REGULATIONS AND BYELAWS** |
| 9.20.1 | The Contractor shall conform to the provisions of any statute relating to the work and regulations and bylaws of any local authority and of any water and lighting Companies or Undertaking with whose system the work is proposed to be connected. He shall, before making any variation from the drawings or the specifications that may be necessitated for such connections give the Engineer, notice specifying the variation proposed to be made and the reasons therefore and shall not carry out any such variation until he has received instructions from the Engineer in respect thereof. The Contractor shall be bound to give all notices required by statute, regulations or bye-laws as aforesaid and to pay all fees and |

| | |
|---|---|
| | taxes payable to any authority in respect thereof. |
| 9.20.2 | **In order to give phillip to Pradhan Mantri Kaushal Vlkas Yojna:**<br>"The contractor shall, at all stages of work deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/ Industrial Training Institute/ National Institute of Construction Management and Research (NICMAR), National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/ Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/ semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer-in-Charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs. 100 per such tradesman per day. Decision of Engineer-in-Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding. |
| **9.21** | **PROGRESS REPORTING :** |
| **9.21.1** | Contractor is required to draw mutually agreed monthly programme in consultation with BHEL well in advance. Contractor shall ensure achievement of agreed programme and shall also timely arrange additional resources considered necessary at no extra cost to BHEL. |
| **9.21.2** | Weekly progress review meetings will be held at site during which actual progress during the week vis-a-vis scheduled programme shall be discussed for actions to be taken for achieving targets. The programme for subsequent week shall also be presented by contractor for discussions. The contractor shall constantly update / revise his work programme to meet the overall requirement. All quality problems shall be discussed during above review meetings. Necessary preventive and corrective action, shall be discussed and decided upon in such review meetings and shall be implemented by the contractor in time bound manner so as to eliminate the cause of non-conformities. |
| **9.21.3** | The contractor shall submit weekly and monthly progress reports, materials reports, consumables (gases / electrodes) report and other reports as per proforma considered necessary by the Engineer. |
| **9.21.4** | The progress report shall indicate the progress achieved against planned , with reasons indicating delays , if any, and shall give the remedial actions which the contractor intends to take to make good the slippage or lost time , so that further works again proceed as per the original programme and the slippages do not accumulate and effect the overall programme. |
| **9.21.5** | The daily manpower reports shall clearly indicate the manpower deployed, category wise specifying also the activities in which they are engaged. |
| **9.22** | **DRAWING AND DOCUMENTS** |
| 9.22.1 | The detailed drawings, specifications available with BHEL engineers will form part |

| | |
|---|---|
| | of this tender specification. These documents will be made available to the contractor during execution of work at site. The contractor will also ensure availability of all drawings / documents at work place. |
| 9.22.2 | Necessary drawings / documents by BHEL to carry out the construction work will be furnished to the contractor by BHEL (except those proposed to be prepared by contractor, as mentioned in this contract) on loan which shall be returned to BHEL Engineer at site after completion of work. Contractor shall ensure safe storage and quick retrieval of these documents. |
| 9.22.3 | The contractor shall maintain a record of all drawings and documents available with him in a register as per format given by BHEL Engineer. Contractor shall ensure use of pertinent drawings / data / documents and removal of obsolete ones from work place and return to BHEL. |
| 9.22.4 | The data furnished in various annexures enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such large scale of work. |
| 9.22.5 | Should any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final and binding on the contractor. |
| 9.22.6 | Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct orf alter any dimension / details, without specific approval of BHEL**.** |
| **9.23** | **MODIFICATION/ DELETION OF GCC & SCC CLAUSES:**<br>**A. GCC Clauses:**<br>i. Clause No. 2.12 of GCC (ORC) shall not be applicable.<br>**B. SCC Clauses:**<br>i. Clause No. 4.1.4 of SCC (CONSUMABLES & OTHER ITEMS) shall not be applicable.<br>ii. 4.2.2 of SCC (Obligations in respect of T&Ps and MMEs provided by BHEL) shall not be applicable.<br>iii. Clause No. 8.3.2, 8.3.3 and 8.3.4 of SCC (Statutory Inspection of Work) shall not be applicable.<br>iv. Clause No. 8.4.1, 8.4.3, 8.4.4, 8.4.6, 8.4.10, 8.4.5.1 (ARRANGEMENT OF INFRASTRUCTURE) of HSE (Document No. HSEP-14 Rev.01) shall not be applicable.<br>v. Clause No. 16 Sl no. 20 & 21 (NON COMPLIANCE) of HSE (Document No. HSEP-14 Rev.01) is not applicable and GCC clause no. 2.8.25 will be applicable. |

| | |
|---|---|
| 10.0 | **TAXES & DUTIES** |
| 10.1 | The contractor shall pay all (save the specific exclusions as enumerated in this clause) taxes, fees, license, charges, deposits, duties, tools, royalty, commissions, other charges, etc. which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes/duties, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.<br><br>However, provisions regarding **GST** on output supply (goods/service) and TDS/TCS as per Income Tax Act shall be as per following clauses. |
| 10.2 | **GST (Goods and Services Tax)** |
| 10.2.1 | GST as applicable on output supply (goods/services) are excluded from contractor's scope; therefore, contractor's price/rates shall be **exclusive** of GST. Reimbursement of GST is subject to compliance of following terms and conditions. BHEL shall have the right to deny payment of GST and to recover any loss to BHEL on account of tax, interest, penalty etc. for non-compliance of any of the following condition. |
| 10.2.2 | The admissibility of GST, taxes and duties referred in this chapter or elsewhere in the contract shall be limited to direct transactions between BHEL & its Contractor. BHEL shall not consider GST on any transaction other than the direct transaction between BHEL & its Contractor. |
| 10.2.3 | Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. Where the GST laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL shall have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor. |
| 10.2.4 | Contractor has to submit GST registration certificate of the concerned state. Contractor also needs to ensure that the submitted GST registration certificate should be in active status during the entire contract period. |
| 10.2.5 | Contractor/Vendor has to issue invoice indicating HSN/SAC code, Description, Value, Rate, applicable tax and other particulars in compliance with the provisions of relevant GST Act and Rules made thereunder. |
| 10.2.6 | Vendor has to submit GST compliant invoice within seven days from the due date of invoice as per GST Law. In case of delay, BHEL reserves the right of denial of GST payment if there occurs any hardship to BHEL in claiming the input thereof. In case of goods, vendor has to provide scan copy of invoice & GR/LR/RR to BHEL before movement of goods starts. Special care should be taken in case of month end transactions. |
| 10.2.7 | Vendor has to ensure that invoice in respect of such services which have been provided/completed on or before end of the month should not bear the date later than last working day of the month in which services are performed. |

| | |
|---|---|
| 10.2.8 | Subject to other provisions of the contract, GST amount claimed in the invoice shall be released on fulfilment of all the following conditions by the Contractor: -<br>a. Supply of goods and/or services have been received by BHEL.<br>b. Original Tax Invoice has been submitted to BHEL.<br>c. Contractor/ Vendor has submitted all the documents required for processing of bill as per contract/ purchase order/ work order.<br>d. In cases where e-invoicing provision is applicable, vendor/contractor is required to submit invoice in compliance with e-invoicing provisions of GST Act and Rules made thereunder.<br>e. Contractor has filed all the relevant GST return (e.g. GSTR-1, GSTR-3B, etc.) pertaining to the invoice submitted and submit the proof of such return along with immediate subsequent invoice. In case of final invoice/ bill, contractor has to submit proof of such return within fifteen days from the due date of relevant return.<br>f. Respective invoice has appeared in BHEL's GSTR - 2A for the month corresponding to the month of invoice. Alternatively, BG of appropriate value may be furnished which shall be valid at least one month beyond the due date of confirmation of relevant payment of GST on GSTN portal or sufficient security is available to adjust the financial impact in case of any default by the contractor.<br>g. Contractor has to submit an undertaking confirming the payment of all due GST in respect of invoices pertaining to BHEL. |
| 10.2.9 | Any financial loss arises to BHEL on account of failure or delay in submission of any document as per contract/purchase order/work order at the time of submission of Tax invoice to BHEL, shall be deducted from contractor's bill or otherwise as deemed fit. |
| 10.2.10 | TDS as applicable under GST law shall be deducted from contractor's bill. |
| 10.2.11 | Contractor shall comply with the provisions of e-way bill wherever applicable. Further wherever provisions of GST Act permits, all the e-way bills , road permits etc. required for transportation of goods needs to be arranged by the contractor. |
| 10.2.12 | Contractor shall be solely responsible for discharging his GST liability according to the provisions of GST Law and BHEL will not entertain any claim of GST/interest/penalty or any other liability on account of failure of contractor in complying the provisions of GST Law or discharging the GST liability in a manner laid down thereunder. |
| 10.2.13 | In case declaration of any invoice is delayed by the vendor in his GST return or any invoice is subsequently amended/altered/deleted on GSTN portal which results in any adverse financial implication on BHEL, the financial impact thereof including interest/penalty shall be recovered from the Contactor's due payment. |
| 10.2.14 | Any denial of input credit to BHEL or arising of any tax liability on BHEL due to non-compliance of GST Law by the Contractor in any manner, will be recovered along with liability on account of interest and penalty (if any) from the payments |

| | |
|---|---|
| | due to the Contactor. |
| 10.2.15 | In the event of any ambiguity in GST law with respect to availability of input credit of GST charged on the invoice raised by the contractor or with respect to any other matter having impact on BHEL, BHEL's decision shall be final and binding on the contractor. |
| 10.2.16 | **Variation in Taxes & Duties:**<br>Any upward variation in GST shall be considered for reimbursement provided supply of goods and services are made within schedule date stipulated in the contract or approved extended schedule for the reason solely attributable to BHEL. However downward variation shall be subject to adjustment as per actual GST applicability.<br>In case the Government imposes any new levy/tax on the output service/goods after price bid opening, the same shall be reimbursed by BHEL at actual. The reimbursement under this clause is restricted to the direct transaction between BHEL and its contactor only and within the contractual delivery period only.<br>In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer but before opening of the price Bid, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of price bid. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer. |
| 10.3 | **Income Tax:**<br><br>**TDS/TCS** as applicable under Income Tax Act, 1961 or rules made thereunder shall be deducted/collected from contractor's bill. |

| | |
|---|---|
| **11.0** | **Defect Liability:**<br><br>All supplies/ works against this order shall be guarantee against defective raw materials Workmanship and performance during use for period of 18 Months from the date of receipt of material or 12 months from the date put into use whichever is earlier, if any manufacturing or technical defect is/are noticed during the course of use of these equipment / spares / works, the contractor shall rectify the defective supply without any extra charges. |

# Chapter XII: ANNEXURES

1. Annexure-I: BOQ for Civil Works
2. Annexure-II: Weight Schedule for ESP Pass-B Unit-4 Chhabra
3. Annexure-III: Foundation Layout for New work of ESP Pass-B Unit4 Chhabra
4. Annexure-IV: Existing ESP Foundation Layout

Annexure-I

| ST NO | BOQ FOR CIVIL WORKS (Supply and Execution)<br>Item Description | Unit | Qty | Factor | Rate= Factor x Total Civil Value (derived from TCC Part-I, Chapter-VI Sl No. A) / 1000 | Amount = Rate x Qty |
|---|---|---|---|---|---|---|
| 100 | **EARTH WORK** | | | | | |
| | **Earth work**: Earth work In excavation, backfilling and disposal including necessary men/women, materials, equipment, loading, transportation, unloading, dewatering etc as per specification, drawing and as directed by engineer- in-charge for the following: | | | | | |
| 101 | Earth work in excavation in all types of soil including ash which can be excavated by any means including setting out, levelling, dewatering (but excluding special type of dewatering viz. well point method), shoring & strutting (but excluding special kind of shoring and strutting as per item 101A) , dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 1Km, spreading/levelling of disposed materials etc all complete for following depths below ground level. | | | | | |
| a | Depth from ground level but not exceeding 2 m | CUM | 3600 | 0.00327043 | | |
| b | Depth exceeding 2 m but not exceeding 4 m | CUM | 3200 | 0.00409418 | | |
| c | Depth exceeding 4 m but not exceeding 6 m | CUM | 1800 | 0.00511154 | | |
| 101A | Extra over item no 101 for providing and installing special kind of shoring and strutting with temporary removable earth retaining structure using steel plates of suitable thickness supported with waler beam and counterfort arrangment including, design, necessary MS clamp, anchors (if required) etc for earth protection during excavation/concreting around foundation and demobilizing the same after completion of work for excavation up to following depth below ground level at specified locations and sides as per drawing. (The design should take care of earth pressure due to overburden, surcharge due to adjacent structure/ facilities, earth moving machinery etc.). Mode of measurement: Area shall be the exposed structural shoring arrangement between ground level and bottom of excavation. | | | 0 | | |
| 101A.i | For excavated depth from ground level but not exceeding 6 m | SQM | 750 | 0.25231016 | | |
| 106 | **Earth work in excavation in hard rock requiring chiselling** including wedging, line drilling, pre shearing etc as required for grading, setting out, levelling, deawtering (wherever required), dressing the sides & bottom, all lifts, stacking/disposal of surplus excavated material within a lead upto 1Km, spreading / levelling of disposed materials etc all complete for following depths below ground level. | | | 0 | | |
| c | Depth exceeding 4 m but not exceeding 6 m | CUM | 100 | 0.01179272 | | |
| d | Depth exceeding 6 m but not exceeding 8 m | CUM | 50 | 0.01415883 | | |
| A107 | Earthwork in Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding **300 mm thickness** using/with selected materials from compulsorily excavated earth available within a lead upto 1 Km and compacted as specified including re-excavation of stacked earth, watering, ramming/compaction by manual/mechanical means, dressing etc all complete.for the following. | | | 0 | | |
| a | Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII) | CUM | 7,250 | 0.0026694 | | |
| A109 | Extra over ST No. 101 and 103 to A108 for carriage of material/earth for every 500m or part thereof beyond an initial lead of 1km. | CUM | 1,500 | 0.0003899 | | |

| ST NO | BOQ FOR CIVIL WORKS (Supply and Execution)<br>Item Description | Unit | Qty | Factor | Rate= Factor x Total Civil Value (derived from TCC Part-I, Chapter-VI Sl No. A) / 1000 | Amount = Rate x Qty |
|---|---|---|---|---|---|---|
| A112 | Supplying and filling **clean and well graded sand** (conforming to IS 383 with **grading zone I to III**) upto any depth under floors, around foundations, plinths, paving, tank foundations, etc. in layers not exceeding 300 mm thickness and compacted so as to achieve at least 80% relative density as per IS-2720 (Part-XIV) including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any) etc. all complete. | CUM | 10 | 0.07155684 | | |
| **200** | **CONCRETE WORKS** | | | 0 | | |
| | **CONCRETE WORK:** Providing and placing concrete work including cost of labour, materials (unless otherwise specified in BOQ/contract specification) and equipment for handling, transportation, batching, mixing, placing, vibrating and curing (excluding cost of centering, shuttering and reinforcement) with mechanised equipments like batching plant, transit mixer, concrete pump etc. complete as per drawing, specifications and as per direction of engineer in charge for the following: | | | 0 | | |
| 202 | Concrete of grade M10 (1 part cement, 3 part sand, 6 parts of 40 mm graded aggregate by volume) as lean concrete, levelling course, mud mat under and around foundations/floors at any depth below finished floor level etc. | CUM | 20 | 0.17721404 | | |
| 203 | Concrete of grade **M15** (1 part cement, 2 part sand, 4 parts of 40 mm graded aggregate by volume) as lean concrete, levelling course, mud mat under and around foundations/floors at any depth below finished floor level etc. | CUM | 400 | 0.18095586 | | |
| 205 | Providing and laying Design Mix cement concrete conforming to IS:456 & IS 10262-2009 for reinforced concrete works with coarse sand and graded hard stone aggregate of 20mm nominal size **in foundations/substructure**, grade slab, paving, drains, under floors etc at all level below finished floor level, any shape, position or thickness etc complete including use of plasticizer/ superplasticizer conforming to IS:9103 (latest) to achieve required slump in concrete all complete as per specification & drawing for the following. | | | 0 | | |
| a | M 25 Grade | CUM | 1,100 | 0.20357184 | | |
| 210 | Extra over ST Nos. 205 for conducting UPV test for concrete at all levels including all equipments, making necessary arrangements, staging, submission of report etc. all complete as directed by engineer in charge and as per specification. | CUM | 200 | 0.01373859 | | |
| 211 | Providing and **encasing of structural steel member with concrete** using nominial aggregate size of 12.5mm down. Encased member shall be wrapped with welded wire mesh/chicken wire mesh with proper lap etc. complete as per specification for the following grades. (Payment of welded wire mesh, chicken wire mesh shall be made separately) | | | 0 | | |
| a | M20 grade | CUM | 0 | 0 | | |
| b | M25 grade | CUM | 40 | 0.18938244 | | |

| ST NO | BOQ FOR CIVIL WORKS (Supply and Execution)<br>Item Description | Unit | Qty | Factor | Rate= Factor x Total Civil Value (derived from TCC Part-I, Chapter-VI Sl No. A) / 1000 | Amount = Rate x Qty |
|---|---|---|---|---|---|---|
| 213 | Providing and laying Design Mix cement concrete as per IS:456 & IS 10262-2009 for reinforced concrete works using graded aggregate for **Concrete in precast works** like roof slabs/trench covers, fins, lintels, chajas, beams, columns, wall panels, facias etc.at all levels in all kinds of work including formwork/moulds, curing, rendering the top exposed surface with cement sand mortar (1:3), handling, storing, transpoting, all leads, erection without damage, setting in position with cement sand mortar (1:3), filling the gaps between adjacent preacast units with M30 grade concrete or cement sand mortar (1:3) and including making of holes for bolts for fixing, welding etc.complete with graded aggregate (20/12.5/10 mm) and as per specification and drawing for following grades. | | | 0 | | |
| a | M 25 grade | CUM | 20 | 0.26282475 | | |
| 215 | Dismantling concrete work for all types of structures at all levels including stacking of servicable material to a lead of 500 m and disposal of unservicable material upto a lead of 2 km, cutting of reinforcement, labour, equipment, safety precautions etc all complete as per drawings, specification and instructions of engineer in charge. | | | 0 | | |
| a | Plain cement concrete of all grades | CUM | 350 | 0.03352996 | | |
| b | Reinforced cement concrete of all grades | CUM | 340 | 0.04788858 | | |
| **300** | **FORM WORKS** | | | 0 | | |
| | **FORMWORK:** Providing, fixing and removing formwork at all elevations for all structures, as per specifications and including all labour, material, scaffoldings and centereing etc. complete as per drawing, specifications and as per direction of engineer in charge for the following: | | | 0 | | |
| 301 | Fairface form work with good quality water proof ply wood of minimum 12mm thickness and smooth surface below finished ground floor level for foundations, footings, base of columns, walls, columns, pilasters, beams, mass concrete, trenches etc.including chamfering of edges as per drawing, specification and instruction of engineer in charge.. | SQM | 1,200 | 0.0144376 | | |
| 304 | Providing, fixing and removing formwork in block-outs/pockets and openings (below 0.1 sqm plan area) at all elevations including cutting, formation of all shapes and all other operations required for making the required shape and size all complete as per specification, drawing and instruction of engineer in charge. | | | 0 | | |
| a | Upto 300 mm depth | EACH | 280 | 0.00920471 | | |
| **400** | **REINFORCEMENT** | | | 0 | | |
| | **REINFORCEMENT WORK**: Reinforcement work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling etc at all level as per specification, drawings and as directed by engineer - in - charge for the following:. | | | 0 | | |
| A402 | Supply, Providing, straightening, cutting, bending, placing in position at all level, binding in position of steel reinforcements of high **yield strength deformed TMT steel bars of grade Fe-500** having minimum elongation of 14.5 % or Fe-500D conforming to IS:1786 including cost of reinforcement steel, binding wire, labour, scaffolding, transportation to & from stores etc complete all as per specifications, drawings and as directed by Engineer. | MT | 110 | 2.50318438 | | |

| ST NO | BOQ FOR CIVIL WORKS (Supply and Execution)<br>Item Description | Unit | Qty | Factor | Rate= Factor x Total Civil Value (derived from TCC Part-I, Chapter-VI Sl No. A) / 1000 | Amount = Rate x Qty |
|---|---|---|---|---|---|---|
| 405 | Providing & fixing of Rebar in existing concrete surface by inserting reinforcemnet bar with Epoxy based suitable bonding compound of Hilti or equivalent make (HIT-RE-500 of Hilti or equivalent make) for interconnection of new R.C. structure with existing R.C. structure. Depth of drilled hole should be suitable to develop maximum recommended strength as per approved manufacturer's recommendation. This item includes supply of all materials including bonding chemicals, T&P required to execute the work, cost of all labour, transportation of chemical, staging to reach work place etc. all complete as directed by Engineer - in - Charge. Random Pull out non destructive test as directed by engineer shall beconducted to ensure strength of bond and same is included in this item. Reinforcement bar shall be paid separately under item no. A402 as applicable. | | | 0 | | |
| a | 12mm Reinforcement bar | EACH | 20 | 0.01295533 | | |
| b | 16mm Reinforcement bar | EACH | 50 | 0.02050813 | | |
| c | 20mm Reinforcement bar | EACH | 50 | 0.028981 | | |
| | **500 WATER PROOOFING WORKS** | | | 0 | | |
| 511 | Providing and applying two coats of bitumen grade 85/25 as per IS 702 ( @ 1.7kg/sqm)with 1% antistripping compound conforming to IS 6241 in foundation, wall, column etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete. | SQM | 1,200 | 0.00415182 | | |
| | **700 MS EMBEDMENTS** | | | 0 | | |
| | **MS EMBEDMENTS**: Embedments including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling etc. at all level as per specification, drawings and as directed by engineer - in - charge for the following: | | | 0 | | |
| A701 | Supply, fabricating and fixing of mild steel embedments, inserts, pipe sleeves, angle pieces, rungs of various diameters, plates of dimensions as required etc. including welding, bolting, cutting, drilling, scaffolding, setting, manual Cleaning and providing with Primer Coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron Dry Film Thickness (DFT). etc. all complete. | MT | 3 | 2.61058998 | | |
| 704 | Supplying, fabricating, erecting and installing following items in concrete/brickwall for all kind of works, including setting material in concrete, layout, scaffoling, cutting, forming, grinding, drilling, bolting, welding, jointing, testing etc. all complete. | | | 0 | | |
| e | Expansion fasteners (mechanical galvanised) of HILTI make or equivalent of safe tensile capacity as specified below for concrete work with expansion sleeve of stainless steel: | | | 0 | | |
| iii | HST M12 | EACH | 25 | 0.00519864 | | |
| iv | HST M16 | EACH | 25 | 0.00982315 | | |
| v | HST M20 | EACH | 25 | 0.01319268 | | |
| **800** | **GROUTING** | | | 0 | | |
| | **GROUTING**: Grouting including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, roughening surface, cleaning, ramming, curing etc. at all level , drawings and as directed by engineer - in - charge for the following: | | | 0 | | |

| ST NO | BOQ FOR CIVIL WORKS (Supply and Execution)<br>Item Description | Unit | Qty | Factor | Rate= Factor x Total Civil Value (derived from TCC Part-I, Chapter-VI Sl No. A) / 1000 | Amount = Rate x Qty |
|---|---|---|---|---|---|---|
| 804 | Providing & grouting of pocket holes, pipe sleeves and under base plates of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with ConbextraGP-1 or equivalent as per specification, drawing and direction of engineer-in-charge. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor). | CUM | 5 | 1.83781923 | | |
| | **1400 FLOORING AND SKIRTING** | | | 0 | | |
| | **FLOORING AND SKIRTING:** Flooring and skirting at all level including base layer, labour, material (unless otherwise specified in BOQ/contract specification), equipments, transportation, handling, curing, polishing etc. at all level as per specification, drawings and as directed by engineer - in - charge for the following: | | | 0 | | |
| A1401 | Providing and laying 50 mm thick **heavy duty cement concrete in flooring** with **metallic hardener pigmented topping** 12mm thick uniform graded treated iron paricles in flooring**.** Under layer of 38mm thick **M20 grade cement concrete** mix (with stone chips of size 12.5mm well graded) and top layer of 12mm thick metallic concrete of mix 1:2 (1 cement hardner mix with approved quality metallic hardening compound :2 stone aggregate 6mm nominal size) by volume including cement slurry, rounding off edges, aluminium strips etc. all complete for following (Quoted item rate shall be inclusive of providing glass joint strips): | SQM | 1625 | 0.01432662 | | |
| **1800** | **MISCELLANEOUS WORKS** | | | 0 | | |
| | **MISCELLANEOUS:** Miscellaneous works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. at all level unless otherwise specified as per specification, drawings and as directed by engineer - in - charge for the following: | | | 0 | | |
| A1801 | Providing and Filling in trenches, plinths, area paving and other underground structures with graded stone aggregate of size range 63 mm to 45 mm (complying IRC specification) in layers not exceeding 200 mm compacted thickness including breaking of stone boulders to required sizes, filling the interstices with selected moorum/non-expansive soil sand and compacting to 85 % of original volume of stone stack for all lifts etc. all complete. Payment shall be made for the measurement of the volume of the compacted fill. | CUM | 375 | 0.07342614 | | |
| 1808 | Supply, Laying of earthing mats/rods including risers, transportation from yard stores, loading, unloading, cutting to length, welding, protective painting of joints etc. all complete. (Excavation & Back filling shall be paid separately under respective item of earth work. Earthing mats/rods shall be supplied by Contractor) | MT | 10 | 3.41058098 | | |
| 1809 | Construction of below ground earthing system test pits as per drawing / sketches including concreting, reinforcement, formwork, providing & fixing GI strip etc as per drawing and specification (excavation & backfilling only will be paid under applicable BOQ items). | EACH | 4 | 0.26973288 | | |
| 1813 | Providing Earthing pit as per drawing with charcoal & salt, GI pipes, GI earth electrodes, GI wire, GI strips, brick chamber with covers including associated earthwork etc. all complete. | EACH | 4 | 0.80650596 | | |
| A1815 | Providing and fixing GI rungs in concrete/brick walls having zinc coating of minimum 610 g/sqm etc. all complete. | Kg | 300 | 0.00259043 | | |

**Note:**

**Annexure-I**

| ST NO | BOQ FOR CIVIL WORKS (Supply and Execution)<br>Item Description | Unit | Qty | Factor | Rate= Factor x Total Civil Value (derived from TCC Part-I, Chapter-VI Sl No. A) / 1000 | Amount = Rate x Qty |
|---|---|---|---|---|---|---|
| 1 | The BOQ quantities indicated above are tentative and are liable to vary depending upon the site requirement. | | | | | |
| 2 | The above BOQ contains quantities for ESP Pass B New Foundation. | | | | | |
| 4 | Scope of work includes dismantling of Exsiting ESP Pass-B foundations, Cable Trestle Foundations and other existing RCC/PCC foundation, paving, drain, steel structures etc. if required. | | | | | |
| 5 | All the materials required to complete the works like TMTs, Cements, sand, earthing rod, earthing strips, Paint, etc. shall be supplied by Contractor. | | | | | |
| 6 | All the T&Ps required to complete the works shall be arranged by Contractor. | | | | | |

**Annexure-II**

# Weight Schedule for ESP Pass-B Unit-4 Chhabra (Execution Only)

| Sl No | PGMA | PGMA Description | Weight (Kg) |
|---|---|---|---|
| **A** | **MECHANICAL ITEMS** | | |
| 1 | 78901 | ROLL/SLIDE SUPPORTS | 5400 |
| 2 | 78905 | ESP-SUB-DELIVERY COMPONENTS | 120 |
| 3 | 78906 | INSULATOR HOUSING AS | 10975 |
| 4 | 78908 | GAS DIST. ASSY | 27510 |
| 5 | 78909 | GD-RAPPING MECHANISM | 4575 |
| 6 | 78910 | GD_DRIVE ARRANGEMENT | 215 |
| 7 | 78911 | GAS SCREEN-EP | 1940 |
| 8 | 78913 | EMIT SYST SUSPENSION | 3865 |
| 9 | 78915 | EMITTING ELECTRODES, HNOM- 135 (33350 Nos.) | 9945 |
| 10 | 78916 | EMIT ELECT RAPP MECH | 12630 |
| 11 | 78917 | DRIVE ARGT. FOR EMIT. SYS | 7165 |
| 12 | 78919 | COL ELEC SUSPENSION | 47060 |
| 13 | 78920 | COLLECTING ELECTRODE, 1.25mm, HNOM- 135 ( 3738 Nos.) EXCL. PKG WT. -5000 KG | 450000 |
| 14 | 78921 | EMIT SYS FRAME-TOP | 47840 |
| 15 | 78922 | EMIT SYS FRAME BOTOM | 52590 |
| 16 | 78923 | INSPECTION DOORS | 3025 |
| 17 | 78924 | SHOCK BARS | 39265 |
| 18 | 78925 | COLL ELECT RAPP MECH | 30090 |
| 19 | 78926 | COLL ELEC RAPP DRIVE | 1490 |
| 20 | 78928 | ESP ROOF BEAM | 57625 |
| 21 | 78932 | EMIT SYS FRAME-MIDLE | 71195 |
| 22 | 78942 | OUTER ROOF-EP | 79565 |
| 23 | 78943 | HOPPER RIDGES | 19485 |
| 24 | 78944 | HOPPER UPPER PART | 85890 |
| 25 | 78945 | HOP MDL & LOWER PART ALONG WITH SS LINER | 121550 |
| 26 | 78946 | INSULATOR SUPP PANEL | 29185 |
| 27 | 78947 | ROOF PANEL ASSY | 46900 |
| 28 | 78948 | CASING STRUCTURE | 89390 |
| 29 | 78949 | CASING SHELL/PANEL | 118455 |
| 30 | 78950 | INLET-OUTLET FUNNEL | 43445 |
| 31 | 78956 | RECTIFIER HANDL SYST | 11055 |
| 32 | 78957 | SPLITTER&GUIDE VANES | 5000 |
| 33 | 78961 | EP PERF TEST EQUIPT | 210 |
| 34 | 78965 | APP PLATFORM-HOPPER | 20950 |
| 35 | 78967 | MIN WOOL FOR ESP INSULATION | 35190 |
| 36 | 78968 | FIXING COMP. FOR ESP INSULATION | 17000 |
| 37 | 78981 | SUPPORTING STRUCTURES FOR ESP | 135310 |
| 38 | 78988 | COMMISSIONING SPARES | 10 |
| 39 | 89610 | EP GALLERIES & STAIRS | 9000 |
| 40 | 89611 | ESP ROOF HANDRAILS | 2500 |

**Annexure-II**

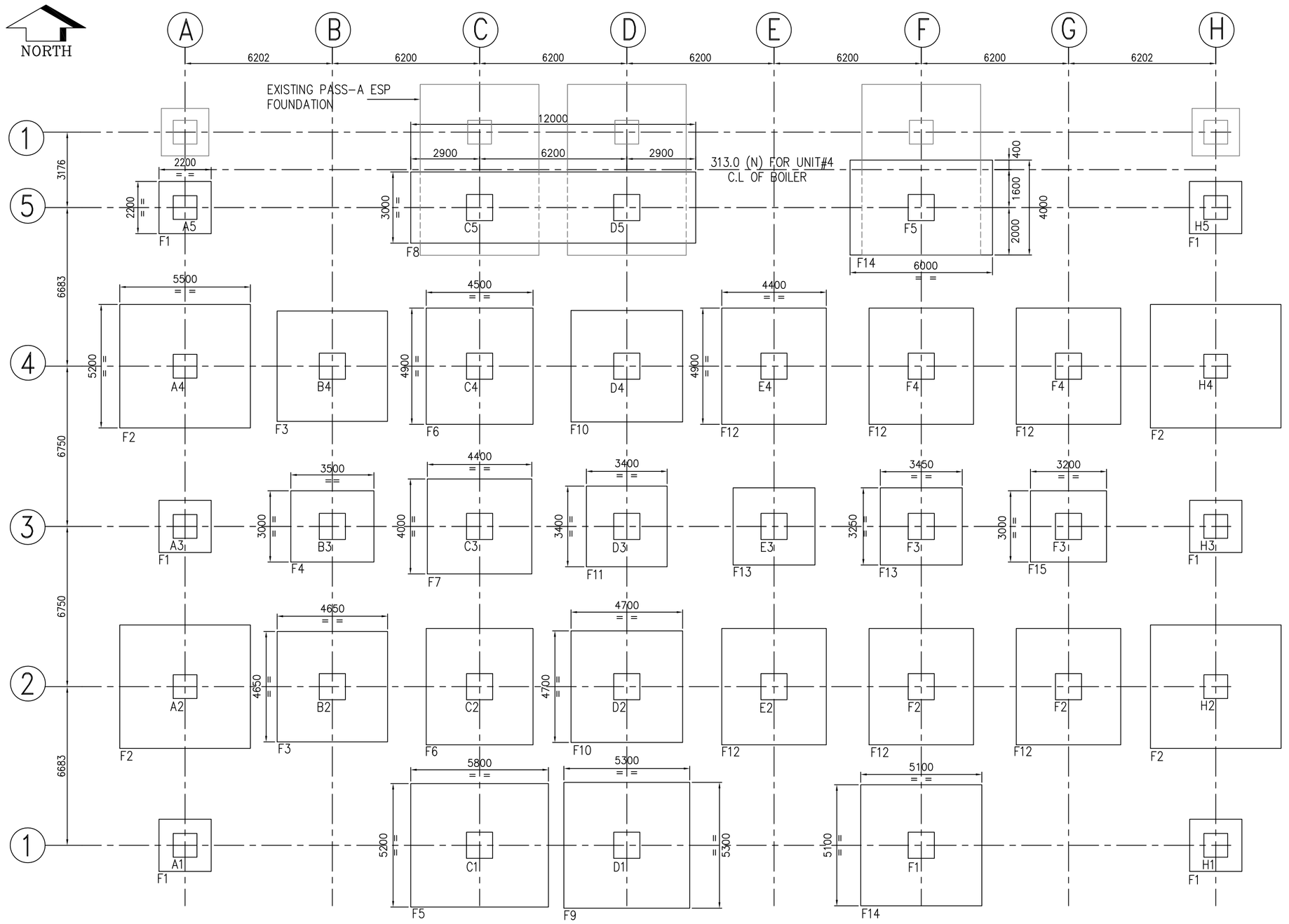
# Weight Schedule for ESP Pass-B Unit-4 Chhabra (Execution Only)

| Sl No | PGMA | PGMA Description | Weight (Kg) |
|---|---|---|---|
| 41 | 89612 | FLOORGRILL & STAIRS | 5000 |
| 42 | 89613 | FLOORGRILL FOR HOPPER PLATFORM | 10850 |
| 43 | 89615 | ALUMINIUM CLADDING SHEET, PLAIN, 1.0 mm | 19500 |
| **B** | | **ELECTRICAL ITEMS** | |
| 1 | | SUPPORT INSULATORS | 2800 |
| 2 | | GEARED MOTORS FOR RAPPING MECH | 5500 |
| 3 | | EARTHING MATERIAL | 5000 |
| 4 | | SUPPORTS MATERIAL / CONTROL ROOM INSERTS | 11000 |
| 5 | | CABLES | 42000 |
| 6 | | CABLE TRAY AND SUPPORTS | 20000 |
| 7 | | MISCELLANEOUS ELECTRICAL ( JB, push button, shaft insulators , Bushing insulators, ASH LEVEL INDICATOR, HVR Disconnecting switch etc ) | 6100 |
| 8 | | TUBULAR HEATING ELEMENTS (FOR HOPPER, INSULATORS) | 860 |
| 9 | | HVR and EC panel | 26782 |
| | | **Total Weight** | **1910002** |
| | | **Total Weight (MT)** | **1910.002** |

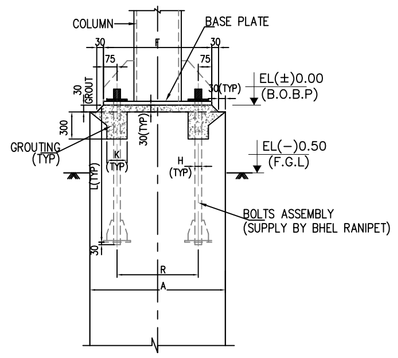
**Note:**

| | |
|---|---|
| 1 | Approx. Weight to be erected for ESP shall be 1910 MT as indicated in Annexure-II for installation as per scope mentioned in the tender specification. The contractor undertakes to erect/commission actual qauntities as per advice of BHEL Engineer and accordingly the final contract price shall be |
| 2 | The Contractor has to erect/install all the equipments/ items supplied by manufacturing units / Engineering centers for the respective packages of ESP to make the system complete in all the respect eventhough if items are not covered in the scope of work of the contract. |
| 3 | The PG MA list as given above is only tentative & indicative. The scope shall include all the PGMAs/ Material issued on instruction of BHEL for completing the system. BHEL Engineer's decision in this regards shall be final. |

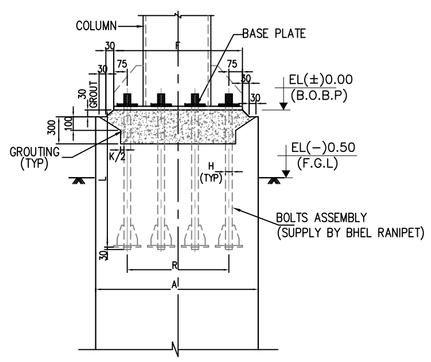
**Annexure-III**



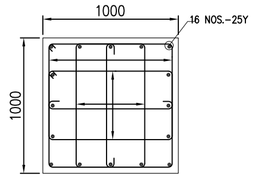

## LAYOUT OF ESP PASS-B FOR UNIT # 4



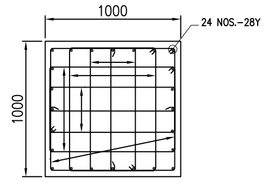

SECTION A–A
(FOR PEDESTAL GROUP I, II & III)



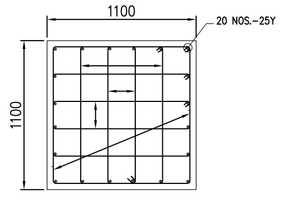

SECTION A–A
(FOR PEDESTAL GROUP IV & V)



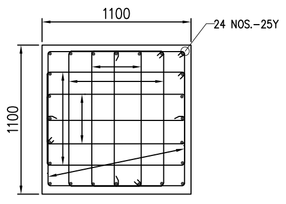

SECTION 1–1
(RC DET. OF PEDESTAL A1, A3, A5 & H1, H3, H5)
TIES 8Y–200C/C PER SET



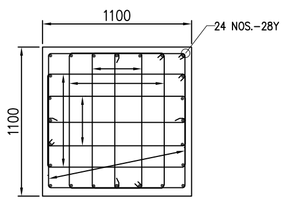

SECTION 1–1
(RC DET. OF PEDESTAL A2, A4, H2, H4)
TIES 8Y–200C/C PER SET



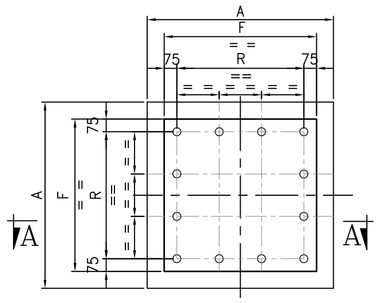

SECTION 1–1
(RC DET. OF PEDESTAL B2, B3, B4, C3, D3, E3, F3, G3)
TIES 8Y–200C/C PER SET



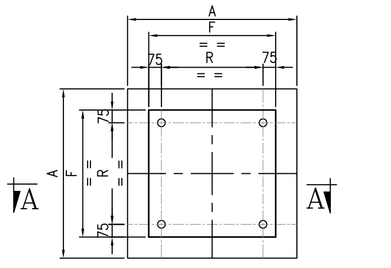

SECTION 1–1
(RC DET. OF PEDESTAL C2, C4, D2, D4, E2, E4, F2, F4, G2, G4)
TIES 8Y–200C/C PER SET



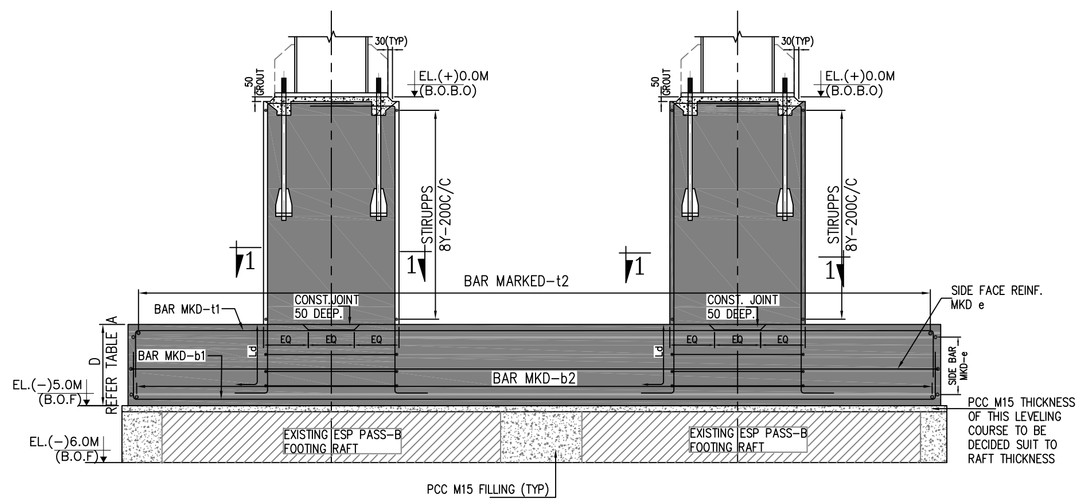

SECTION 1–1
(RC DET. OF PEDESTAL C1, C5, D1, D5, F1, F5)
TIES 8Y–200C/C PER SET



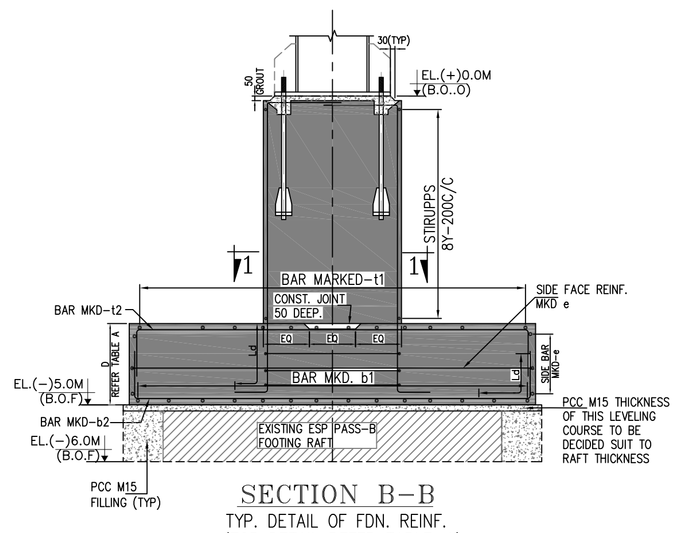

TYP. PLAN POCKET DETAILS FOR PEDESTAL
(FOR GROUP IV & VI)
REF. TABLE – B)



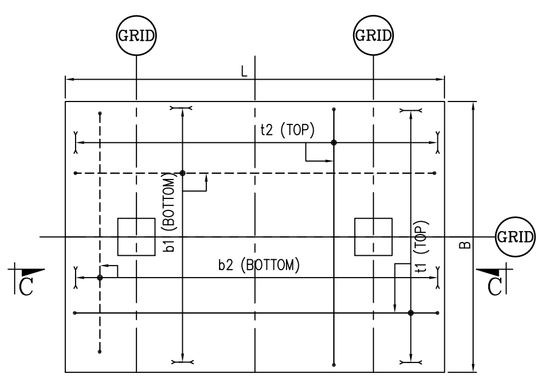

TYP. PLAN POCKET DETAILS FOR PEDESTAL
(FOR GROUP I, II & III)
REF. TABLE – B)



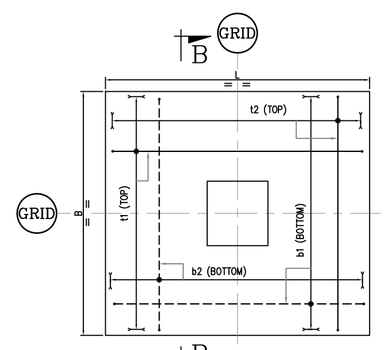

SECTION C–C
TYP. DETAIL OF FDN. REINF.
(FOR FOOTING DEPTH & FOUNDATION DETAILS REFER TABLE–A




SECTION B–B
TYP. DETAIL OF FDN. REINF.
(FOR DETAIL REFER TABLE–A)




TYP. FOUNDATION DETAIL
(FOR FOOTING F8)




TYP. FOUNDATION DETAIL
(FOR ALL FOOTING EXCEPT F8 & F14)

## TABLE–B (SCHEDULE OF PEDESTALS)

| GROUP | PEDESTAL MKD. | A | F | R | H | K | L |
|---|---|---|---|---|---|---|---|
| I | A1 TO A5 & H1 TO H5 | 1000 | 750 | 600 | 50 | 150 | 1300 |
| II | B2, B3, B4, D2, D3, D4 | 1100 | 850 | 700 | 50 | 150 | 1300 |
| III | F2, F3, F4, G2, G3, G4 | 1100 | 850 | 700 | 40 | 120 | 900 |
| IV | C2, C3, C4, E2, E3, E4 | 1100 | 900 | 750 | 40 | 120 | 900 |
| V | C1, C5, D1, D5, F1, F5 | 1100 | 900 | 750 | 50 | 150 | 1300 |

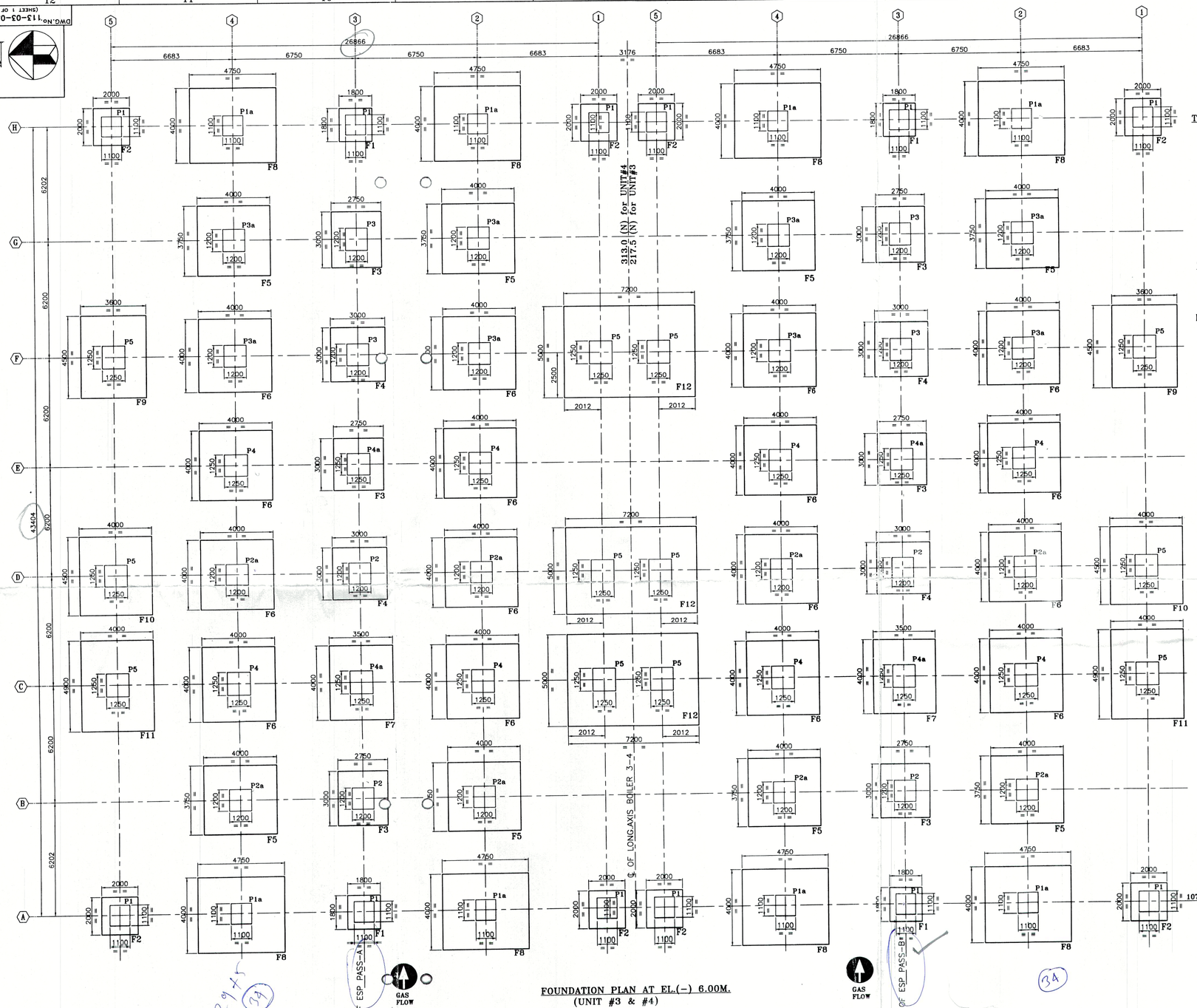
## TABLE–A

SCHEDULE OF FOOTING REINFORCEMENT

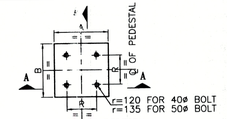
| FOOTING MKD. | FOOTING SIZE | | | Along L | | Along B | | SIDE FACE REINF. e |
|---|---|---|---|---|---|---|---|---|
| | L | B | DEPTH D | b1 | t1 | b2 | t2 | |
| F1 | 2200 | 2200 | 450 | 12Y–175 | 12Y–175 | 12Y–175 | 12Y–175 | – |
| F2 | 5500 | 5200 | 1000 | 20Y–200 | 20Y–200 | 20Y–200 | 20Y–200 | 12Y @ 300 |
| F3 | 4650 | 4650 | 850 | 16Y–150 | 16Y–150 | 16Y–150 | 16Y–150 | 12Y @ 300 |
| F4 | 3500 | 3000 | 700 | 16Y–175 | 16Y–175 | 16Y–175 | 16Y–175 | – |
| F5 | 5800 | 5200 | 1000 | 20Y–200 | 20Y–200 | 20Y–200 | 20Y–200 | 12Y @ 300 |
| F6 | 4900 | 4500 | 900 | 20Y–225 | 20Y–225 | 20Y–225 | 20Y–225 | 12Y @ 300 |
| F7 | 4400 | 4000 | 750 | 16Y–175 | 16Y–175 | 16Y–175 | 16Y–175 | 12Y @ 300 |
| F8 | 12000 | 3000 | 1050 | 16Y–125 | 16Y–125 | 16Y–125 | 16Y–125 | 12Y @ 300 |
| F9 | 5300 | 5300 | 800 | 20Y–250 | 20Y–250 | 20Y–250 | 20Y–250 | 12Y @ 300 |
| F10 | 4700 | 4700 | 950 | 20Y–200 | 20Y–200 | 20Y–200 | 20Y–200 | 12Y @ 300 |
| F11 | 3400 | 3400 | 1050 | 16Y–125 | 16Y–125 | 16Y–125 | 16Y–125 | 12Y @ 300 |
| F12 | 4900 | 4400 | 1000 | 20Y–225 | 20Y–225 | 20Y–225 | 20Y–225 | 12Y @ 300 |
| F13 | 3450 | 3250 | 1050 | 16Y–125 | 16Y–125 | 16Y–125 | 16Y–125 | 12Y @ 300 |
| F14 | 5100 | 5100 | 1000 | 20Y–200 | 20Y–200 | 20Y–200 | 20Y–200 | 12Y @ 300 |
| F15 | 3200 | 3000 | 700 | 16Y–175 | 16Y–175 | 16Y–175 | 16Y–175 | – |

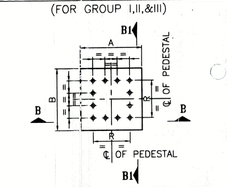
**Annexure-IV**

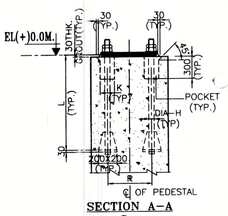
DWG.NO 113-03-0301 (SHEET 1 OF 2)

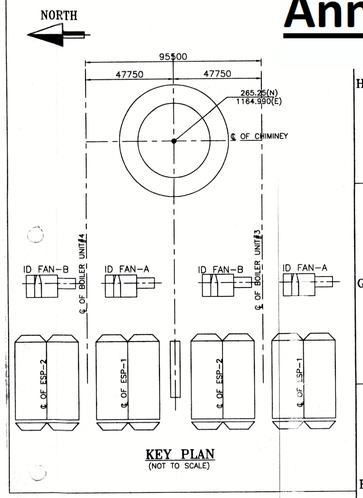


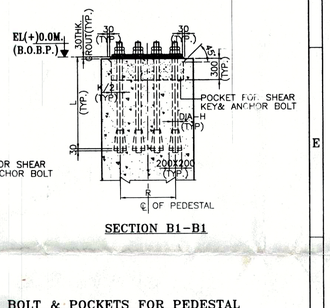

FOUNDATION PLAN AT EL.(-) 6.00M.
(UNIT #3 & #4)




SCHEDULE OF ANCHOR BOLT & POCKETS FOR PEDESTAL

| PED. MKD. | COLUMN MARK | GROUP | PED.SIZE A | PED.SIZE B | ANCHOR BOLT & POCKET R | H | K | L | BASE PLATE |
|---|---|---|---|---|---|---|---|---|---|
| P1 | A1,A3,A5,H1,H3,H5 | I | 1100 | 1100 | 600 | 50 | 150 | 1300 | 750 |
| P1a | A2,A4,H2,H4 | I | 1100 | 1100 | 600 | 50 | 150 | 1300 | 750 |
| P2 | B3,D3 | II | 1200 | 1200 | 700 | 50 | 150 | 1300 | 850 |
| P2a | B2,B4,D2,D4 | II | 1200 | 1200 | 700 | 50 | 150 | 1300 | 850 |
| P3 | F3,G3 | III | 1200 | 1200 | 700 | 40 | 120 | 900 | 850 |
| P3a | G2,G4,F2,F4 | III | 1200 | 1200 | 700 | 40 | 120 | 900 | 850 |
| P4 | C2,C4,E2,E4 | IV | 1250 | 1250 | 750 | 40 | 120 | 900 | 900 |
| P4a | C3,E3 | IV | 1250 | 1250 | 750 | 40 | 120 | 900 | 900 |
| P5 | D1,D5,F1,F5,C1,C5 | V | 1250 | 1250 | 750 | 50 | 150 | 1300 | 900 |

NOTE:-
THIS DRAWING IS APPROVED BY TCE ON DATED 30-04-09

REFERENCE DRAWINGS.

ENGG.DWG.NO(BHEL):
1. 1-00-112-28489 (R-0)

CONSTRUCTION DWG.NO(INDURE):
1. 113-03-0301-R1. (SH. 2 OF 2)

SR. No. PARTY
PRINT DISTRIBUTION

NOTES

01. ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS ARE METERS UNLESS NOTED OTHERWISE
02. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CONTRACT TEAMS AND CONDITIONS,SPECIFICATION AND SCHEDULE OF ITEMS.
03. MINIMUM GRADE OF CONCRETE USED FOR FOUNDATION SHALL BE M25.
04. REINFORCEMENT GRADE SHALL BE Fe415 HYSD BARS CONFORMING TO IS: 1786.
05. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE PEDESTAL - 50mm., FOOTING : BOTTOM- 75mm. AND TOP & SIDES - 50mm.
06. EL.(-)0.0M. CORRESPONDS TO FINISHED FLOOR LEVEL OF POWER HOUSE BUILDING WHICH CORRESPONDS TO SITE RL.396.5M. ABOVE MSL.
07. LEAN CONC. SHALL BE OF M15 CONC. AND SHALL BE100 mm THK.
08. HOLDING DOWN ANCHOR BOLTS IN ESP COLUMN FOUNDATIONS WILL BE SUPPLIED BY BHEL AND INSTALLED IN POSITION BY CIVIL CONTRACTOR.BHEL'S APPROVAL SHALL BE OBTAINED AT SITE PRIOR TO CONCRETING OF PEDESTALS.
09. NET SAFE BEARING CAPACITY OF SOIL HAS BEEN CONSIDERED 50.T/M$^2$ AT FOUNDING LEVEL.

NOTES

10. DOWELS FOR ENCASEMENT TO BE PROVIDED IN PEDESTALS AS SHOWN. ENCASEMENT TO BE DONE BY CIVIL CONTRACTOR AFTER ERECTION OF STEEL COLUMNS AS PER IS:456 LATEST.
11. REINFORCEMENT IF REQUIRED SHALL BE MARGINALLY SHIFTED TO CLEAR ANY ANCHORE BOLT. BUT IN NO CASE SHALL BE CUT WITHOUT PRIOR APPROVAL OF SITE ENGINEER.
12. LATERAL TIES IN THE PEDESTALS MAY BE MARGINALLY ADJUSTED AT SITE TO CLERAR ANCHOR BOLTS AND SHEAR LUG GROUT POCKET.
13. NON SHRINK FREE FLOW GROUTING BELOW THE BASE PLATE OF COLUMNS SHALL BE DONE AS PER SPECIFICATION,GROUTING CONCRETE ARE IN BOP CONTRACTOR'S SCOPE.
14. ANY LOCALIZED POCKET OF SOIL/CLAY BELOW THE FOUNDING LEVEL,THE SAME SHALL BE REMOVED & REPLACED WITH P.C.C.1:4:8.
15. ON EXTERNAL SURFACE OF FOUNDATION BITUMINUOUS PAINTING AS PER SECTION D4.6(SHEET70F8)IS TO BE PROVIDED.

NOTICE

THIS DRAWING IS THE PROPERTY OF DESEIN PRIVATE LIMITED, NEW DELHI, AND IS LENT SUBJECT TO THE CONDITION THAT IT SHALL NOT BE REPRODUCED, COPIED, LENT OR OTHERWISE DISPOSED OF, DIRECTLY OR INDIRECTLY, IT SHALL NOT BE USED TO FURNISH ANY INFORMATION FOR THE MAKING OF DRAWINGS, APPARATUS, OR PARTS THEREOF EXCEPT FOR THE PROJECT SPECIFICALLY PROVIDED FOR BY CONTRACT AGREEMENT WITH DESEIN.

| ZONE | MARK | PARTICULARS | DATE | HOD. | STRUCT | MECH. | EL C. |
|---|---|---|---|---|---|---|---|
| | 7 | | | | | | |
| | 6 | | | | | | |
| | 5 | | | | | | |
| | 4 | | | | | | |
| | 3 | | | | | | |
| | 2 | | | | | | |
| | 1 | REVISED AS PER TCE COMMENTS & RELEASED FOR APPROVAL | 04.04.09 | | | | |
| | 0 | RELEASED FOR APPROVAL | 21.03.09 | | | | |

REVISIONS — APPRD BY — CLEARED BY

| | |
|---|---|
| PROJECT | CHHABRA THERMAL POWER PROJECT<br>STAGE - I , PHASE - II, 2x250 MW<br>UNIT # 3 & 4 |
| OWNER | RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LTD.<br>JAIPUR - RAJASTHAN |
| OWNER'S CONSULTANT:- APPROVED & DATE | TCE CONSULTING ENGINEERS LIMITED<br>BANGALORE |
| CONTRACTOR:- APPROVED & DATE | THE INDURE PVT. LIMITED<br>EPC BUSINESS GROUP<br>NEW DELHI - INDIA |
| INDURE'S CONSULTANT:- | DESEIN<br>CONSULTING ENGINEERS<br>NEW DELHI – INDIA |

| | |
|---|---|
| DRAWN | B.PRASAD |
| DESIGNED | S.LOKOTI |
| CHECKED | S.K.C. |

TITLE
ESP AREA
GA & RC DETAIL OF ESP FOUNDATION

SCALE : 1:100 | SHEET : A1
JOB. No. I-3062
DWG. No. 113-03-0301 (SHEET 1 OF 2) | REV. 1

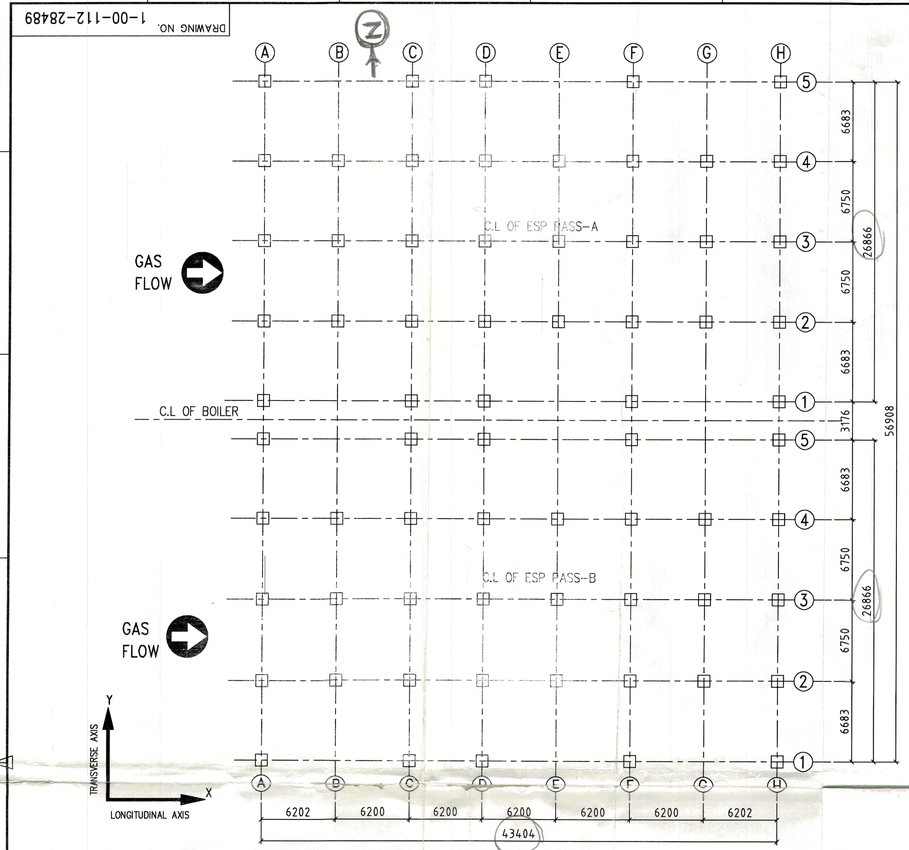
APPRD. FOR CONSTRUCTION:

RELEASED FOR CONSTRUCTION

Limits 841x594 (A1/1:1)

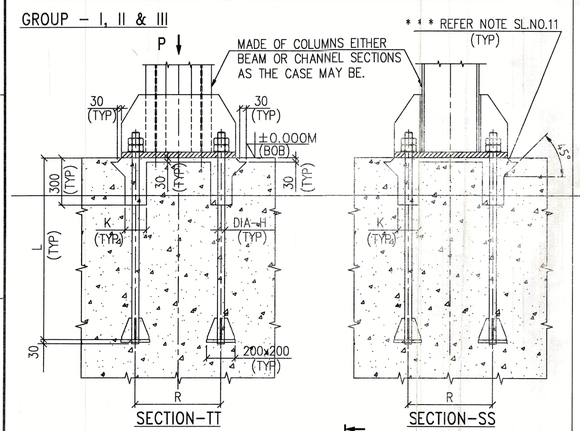
**Annexure-IV**

DRAWING NO. 1-00-112-28489

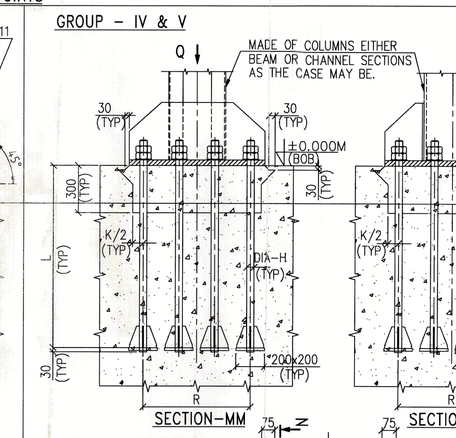



LOCATION OF FOUNDATION POINTS

GROUP – I, II & III




SECTION–TT




SECTION–SS

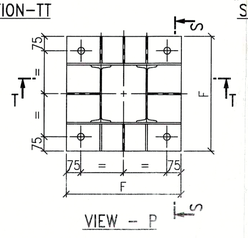
GROUP – IV & V



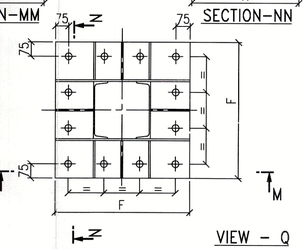

SECTION–MM




SECTION–NN




VIEW – P




VIEW – Q

## LEGEND:–

H – HORIZONTAL SHEAR
V – VERTICAL LOAD
V(+) – LOAD ACTING DOWNWARDS
V(−) – LOAD ACTING UPWARDS
BOB – BASE PLATE BOTTOM

## NOTE:–

1. ESP SIZE : 2XFAA–7X45H–2X132135–2
2. ALL LOADS ARE IN TONS. MOMENTS ARE IN TONNE METER.
3. SEISMIC ZONE AS PER IS:1893(PART–4):2005 IS ZONE–II.
   – IMPORTANCE FACTOR=1.75
   – HORIZONTAL SEISMIC DESIGN CO–EFFICIENT(Ah) = 0.05
4. AVERAGE WIND PRESSURE CONSIDERED IS 165 KG/M² AS PER IS:875(Part–3)–1987.
   – BASIC WIND SPEED–47 M/S.
   – TERRAIN CATAGORY–2.
   – CLASS OF STRUCTURE–B.
   – WIND PRESSURE AT DIFFERENT ELEVATION:

| Ht(M) | K2 | Pr (Pa) |
|---|---|---|
| 10 | 0.98 | 1457 |
| 15 | 1.02 | 1579 |
| 20 | 1.05 | 1673 |
| 30 | 1.1 | 1836 |

5. ASH DENSITY CONSIDERED FOR STRENGTH CALCULATION=1600 KG/M³.
6. FOR STRENGTH CALCULATION HOPPER FULLY FILLED WITH ASH IS CONSIDERED.
7. ±0.000 M CORRESPONDS TO ESP COLUMN BASE PLATE BOTTOM(BOB). −200 REFERS TO LOCAL GROUND LEVEL IN BOILER AND ESP AREA WHICH CORRESPONDS TO RL 396.3M.
8. MINIMUM GRADE OF CONCRETE USED FOR FOUNDATION SHALL BE M25.
9. GRADE OF CONCRETE MIX USED FOR GROUTING SHALL BE ONE GRADE HIGHER THAN THE CONCRETE USED FOR FOUNDATION.
10. CLEAR OR REMOVE THE RUST AND DUST OF THE FOUNDATION MATERIALS BEFORE EMBEDMENT, IF ANY.
11. *** THIS PORTION SHALL BE GROUTED AND FILLED WITH CONCRETE AFTER ALIGNMENT OF ALL COLUMNS.
12. REFER ID SYSTEM LAYOUT DRAWING FOR ESP LOCATION WITH RESPECT TO BOILER COLUMN.

## IMPORTANT NOTE

CHANGES WITH RESPECT TO CHHABRA# 1 &2

1. DIMENSION CHANGES AS GIVEN IN TABLE–A.

THE ABOVE CHANGE SHALL BE TAKEN CARE BY CUSTOMER/CONCERNED AGENCY DURING CIVIL EXECUTION.

| TABLE–A. | DIMENSION CHANGES | |
|---|---|---|
| DESCRIPTION | CHHABRA–1&2 | CHHABRA–3&4 |
| GAS FLOW DIRECTION | 6195 | 6202 |
| TOTAL LENGTH | 43390 | 43404 |
| ACROSS GAS FLOW | 6671 | 6683 |
| TOTAL WIDTH | 56884 | 56908 |

## LOADING CHART:

ALL DIMENSIONS ARE IN MILLIMETRES

| LOADING CASE / COLUMN | LOAD DUE TO DL & LL | | LOAD DUE TO WIND | | | | | LOAD DUE TO EARTH QUAKE | | | | | GROUP OF COLUMNS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DEAD LOAD | LIVE LOAD | X DIRECTION | | | Y DIRECTION | | X DIRECTION | | | Y DIRECTION | | |
| | TONS | TONS | H (T) | V (T) | $M_Y$ (T–M) | H (T) | V (T) | H (T) | V (T) | $M_Y$ (T–M) | H (T) | V (T) | |
| A1 | 45.5 | 79.1 | ±2.0 | ∓5.0 | 6.0 | –– | –– | ±3.0 | ∓14.0 | 11.0 | –– | –– | I |
| A2 | 26.7 | 79.1 | ±2.0 | –– | 6.0 | ±14.1 | ∓39.6 | ±1.5 | –– | 5.4 | ±23.5 | ∓64.6 | I |
| A3 | 51.2 | 79.1 | ±2.0 | –– | 6.0 | –– | –– | ±1.5 | –– | 5.4 | –– | –– | I |
| A4 | 26.7 | 79.1 | ±2.0 | –– | 6.0 | ±14.1 | ±39.6 | ±1.5 | –– | 5.4 | ±23.5 | ±64.6 | I |
| A5 | 45.5 | 79.1 | ±2.0 | ∓5.0 | 6.0 | –– | –– | ±3.0 | ∓14.0 | 11.0 | –– | –– | I |
| B2 | 72.2 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ∓39.6 | ±12.0 | –– | 44.0 | ±23.5 | ∓64.6 | II |
| B3 | 72.2 | 158.2 | ±2.0 | –– | 6.0 | –– | –– | ±12.0 | –– | 44.0 | –– | –– | II |
| B4 | 72.2 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ±39.6 | ±12.0 | –– | 44.0 | ±23.5 | ±64.6 | II |
| C1 | 65.9 | 118.6 | ±15.0 | ∓29.0 | 50.0 | –– | –– | ±25.0 | ∓51.0 | 86.0 | –– | –– | V |
| C2 | 63.4 | 158.2 | ±2.0 | ∓6.4 | 6.0 | ±14.1 | ∓39.6 | ±12.0 | ∓44.0 | 44.0 | ±23.5 | ∓64.6 | IV |
| C3 | 63.4 | 158.2 | ±2.0 | ∓6.4 | 6.0 | –– | –– | ±12.0 | ∓44.0 | 44.0 | –– | –– | IV |
| C4 | 63.4 | 158.2 | ±2.0 | ∓6.4 | 6.0 | ±14.1 | ±39.6 | ±12.0 | ∓44.0 | 44.0 | ±23.5 | ±64.6 | IV |
| C5 | 65.9 | 118.6 | ±15.0 | ∓29.0 | 50.0 | –– | –– | ±25.0 | ∓51.0 | 86.0 | –– | –– | V |
| D1 | 48.2 | 118.6 | ±15.0 | ±11.0 | 50.0 | –– | –– | ±25.0 | ±18.0 | 86.0 | –– | –– | V |
| D2 | 64.9 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ∓39.6 | ±12.0 | –– | 44.0 | ±23.5 | ∓64.6 | II |
| D3 | 64.9 | 158.2 | ±2.0 | –– | 6.0 | –– | –– | ±12.0 | –– | 44.0 | –– | –– | II |
| D4 | 64.9 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ±39.6 | ±12.0 | –– | 44.0 | ±23.5 | ±64.6 | II |
| D5 | 48.2 | 118.6 | ±15.0 | ±11.0 | 50.0 | –– | –– | ±25.0 | ±18.0 | 86.0 | –– | –– | V |
| E2 | 64.9 | 158.2 | ±2.0 | ±6.4 | 6.0 | ±14.1 | ∓39.6 | ±12.0 | –– | 44.0 | ±23.5 | ∓64.6 | IV |
| E3 | 64.9 | 158.2 | ±2.0 | ±6.4 | 6.0 | –– | –– | ±12.0 | –– | 44.0 | –– | –– | IV |
| E4 | 64.9 | 158.2 | ±2.0 | ±6.4 | 6.0 | ±14.1 | ±39.6 | ±12.0 | –– | 44.0 | ±23.5 | ±64.6 | IV |
| F1 | 83.9 | 158.2 | ±16.0 | ±18.0 | 52.0 | –– | –– | ±26.0 | ±33.0 | 89.0 | –– | –– | V |
| F2 | 63.4 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ∓39.6 | ±11.0 | –– | 40.0 | ±23.5 | ∓64.6 | III |
| F3 | 63.4 | 158.2 | ±2.0 | –– | 6.0 | –– | –– | ±11.0 | –– | 40.0 | –– | –– | III |
| F4 | 63.4 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ±39.6 | ±11.0 | –– | 40.0 | ±23.5 | ±64.6 | III |
| F5 | 83.9 | 158.2 | ±16.0 | ±18.0 | 52.0 | –– | –– | ±26.0 | ±33.0 | 89.0 | –– | –– | V |
| G2 | 69.5 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ∓39.6 | ±10.0 | –– | 38.0 | ±23.5 | ∓64.6 | III |
| G3 | 69.5 | 158.2 | ±2.0 | –– | 6.0 | –– | –– | ±10.0 | –– | 38.0 | –– | –– | III |
| G4 | 69.5 | 158.2 | ±2.0 | –– | 6.0 | ±14.1 | ±39.6 | ±10.0 | –– | 38.0 | ±23.5 | ±64.6 | III |
| H1 | 43.6 | 79.1 | ±2.0 | ±5.0 | 6.0 | –– | –– | ±3.0 | ±14.0 | 11.0 | –– | –– | I |
| H2 | 26.7 | 79.1 | –– | –– | –– | ±14.1 | ∓39.6 | ±1.5 | –– | 5.4 | ±23.5 | ∓64.6 | I |
| H3 | 51.2 | 79.1 | –– | –– | –– | –– | –– | ±1.5 | –– | 5.4 | –– | –– | I |
| H4 | 26.7 | 79.1 | –– | –– | –– | ±14.1 | ±39.6 | ±1.5 | –– | 5.4 | ±23.5 | ±64.6 | I |
| H5 | 43.6 | 79.1 | ±2.0 | ±5.0 | 6.0 | –– | –– | ±3.0 | ±14.0 | 11.0 | –– | –– | I |

| GROUP OF COLUMNS | F | R | H | K | L | COLUMNS |
|---|---|---|---|---|---|---|
| I | 750 | 600 | 50 | 150 | 1300 | A1, A2, A3, A4, A5 H1, H2, H3, H4, H5 |
| II | 850 | 700 | 50 | 150 | 1300 | B2, B3, B4, D2, D3, D4 |
| III | 850 | 700 | 40 | 120 | 900 | F2, F3, F4, G2, G3, G4 |
| IV | 900 | 750 | 40 | 120 | 900 | C2, C3, C4, E2, E3, E4 |
| V | 900 | 750 | 50 | 150 | 1300 | C1, C5, D1, D5, F1, F5 |

| BOLT SIZE (MATL.CODE) | COLUMNS | QTY/ COLUMN | TOTAL QTY/ BOILER |
|---|---|---|---|
| D50 – 1475 (37–908–008–8050) | A1, A2, A3, A4, A5 H1, H2, H3, H4, H5 B2, B3, B4, D2, D3, D4 | 04 | 128 |
| D50 – 1475 (37–908–008–8050) | C1, C5, D1, D5, F1, F5 | 12 | 144 |
| D40 – 1050 (37–908–008–7640) | F2, F3, F4, G2, G3, G4 | 04 | 48 |
| D40 – 1050 (37–908–008–7640) | C2, C3, C4, E2, E3, E4 | 12 | 144 |

TCE CONSULTING ENGINEERS LTD., VENDOR DOCUMENT REVIEW STATUS

- A Drawing approved as submitted; proceed with fabrication & construction.
- B Drawing approved subject to comments noted; proceed with fabrication & construction.
- C Our comments are noted on this marked up print.
- D Our comments are noted in memo attached to the forwarding transmittal letter No. RP/MDT-0 Dated 11.03.09
- E Correct drawing of this drawing to reflect our comments and resubmit for approval.
- F Correct drawing of this drawing to reflect our comments and resubmit for records.
- G Drawings of this category are for information only and not for approval. Information furnished on the drawing is noted.
- H Drawing reviewed against our previous comments and other revisions highlighted and identified by the vendor.
- I Drawing returned unreviewed.

Approval conveyed herein neither relieves Vendor / Contractor of his contractual obligations and his responsibilities for correctness of dimensions, details assembly fits, system / performance requirements and workmanship of supplies with Indian Statutory Laws as may be applicable, nor does it limit the Purchaser's rights under the contract.

Reviewed by [illegible] Date 11.03.09

CUST NO. R332 & R333

| | |
|---|---|
| TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT | M/s. RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LTD, CHHABRA#3&4, (2x250MW) |
| BHARAT HEAVY ELECTRICALS LTD., UNIT: BOILER AUXILIARIES PLANT. RANIPET – 632 406. | DRN M.K.NAHAK 03.02.09; CHD K.B.PADHI 03.02.09; APPD S.S.MANI 03.02.09 |
| DEPT AQCS; CODE 862; GRADE OF UNTOL.DIM PR: 0A: 500; SCALE N.T.S; WEIGHT (KG). ** | REF. TO ASSY/OLD DRG. –; ITEM NO. –; NO. OF ITEMS –; REV 00 |
| TITLE: FOUNDATION PLAN FOR ESP AT ±0.000M LEVEL | CARD CODE U 01; DRAWING NO. 1-00-112-28489 |

REV | DATE | ALTERED / CHECKED | ZONE

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

Size A1

TCE-5225A-510-B029-1R0

# TECHINICAL CONDITIONS OF CONTRACT (TCC)

## FOR THE

## RESTORATION OF ELECTROSTATIC PRECIPITATOR FOR PASS-B AT 250 MW UNIT-4 CTPP, CHHABRA RVUNL

## PART-II

**Bharat Heavy Electricals Limited**
(A Govt. Of India Undertaking)
**Power Sector – Northren Region,**
**Plot No. 25 , Sector - 16A ,**
**Distt. Gautam Budh Nagar, NOIDA – 201 301 (INDIA)**

| | |
|---|---|
| 1.1 | The intent of this specification is to provide services for execution of the project according to most modern and proven techniques and codes . The omission of specific reference to any method , equipment or material necessary for the proper and efficient services towards installation of the plant shall not relieve the contractor of the responsibility of providing such services / facilities to complete the work or portion of work awarded to him . The quoted / accepted rates / lumpsum price shall deem to be inclusive of all such contingencies . |
| 1.2 | The contractor shall carry out the work in accordance with standard practices / codes / Instructions / drawings / documents / specification supplied by BHEL from time to time. |
| 1.3 | The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during erection . If any portion of work is found to be defective in workmanship , not conforming to drawings or other stipulations , the contractor shall dismantle and redo the work duly replacing the defective materials at his cost . Failing which the job will be carried out by BHEL by engaging other agencies / departmentally and recoveries will be affected from contractor's bills towards expenditure incurred including BHEL's usual overhead charges |
| 1.4 | Following shall be the responsibility of contractor and have to be provided within finally accepted rates / prices : |
| 1.4.1 | On Provision , as required , of all types of labour , supervisors , engineers , watch and ward , tools & tackles , calibrated inspection , measuring and testing equipment as specified and otherwise required for the work , consumables for erection , testing and commissioning. |
| 1.4.2 | Proper out - turn as per BHEL plan and commitment. |
| 1.4.3 | Completion of work as per BHEL Schedule. |
| 1.4.4 | Good quality and accurate workmanship for proper performance of the equipment. |
| 1.4.5 | Preservation / Re - conservation of all components during storage / erection / commissioning till handing over. |
| 1.5 | BHEL - Power Sector ( NR ) is ISO 9001-2000 , ISO 14001-1996 and OHSAS 18001-1999 certified company . Quality of work , to customer's satisfaction and system requirements are the essence of these certifications . The contractor in all respects will organize his work , systems , environment , process control documentation , tools , plant , inspection , measuring and testing equipment etc. as per instructions of BHEL engineer . |

| | |
|---|---|
| 2.1 | • The contractor's scope shall include dismantling of existing foundations, floor, grade slab, excavation in soil and rock, dewatering, dressing to required profile, shoring/strutting, backfilling around completed structures and plinth filling, plinth protection, disposal of surplus earth and rock, concreting including reinforcement and formwork, masonry work, plastering, , flooring, dismantling of existing foundations (below ground and above ground, structural steel, other facilities), underground earthing, water proofing of underground structures, , final grading, , checking, cleaning chipping and levelling of foundations, etc, Complete work of handling, loading and transporting of materials from project stores sheds / storage yards to site of erection and site clearance before handing over to Owner and other auxiliary items of work, etc. all complete including supply of all materials (except those specified in BHEL scope), consumables, labor, Tools and plants, transportation and storage, sample testing , lab testing equipment, shuttering material etc. all complete as per BOQ, specifications and drawings for proper and successful execution of the job .<br>• All the works areas shall be adequately flood lighted to the satisfaction of the Engineer-in-Charge when the work is in progress during the night shifts.<br>• Drawings showing enough details for the construction as per the specification shall be furnished to the contractor in a phased manner as far as possible.<br>• The bidder should fully apprise himself of the prevailing conditions at the proposed site, climatic conditions including monsoon pattern, local conditions, soil strata and site specific parameters and shall include for all such conditions and contingent measures in the bid, including those which may have not been specifically brought out in the specifications |
| 2.2 | **Cement and Steel Supply:** Cement, sand, aggregate , Reinforcement Steel required for this tender's scope shall be procured by contractor. |
| 2.3 | The working area shall be separated from the existing plant area by suitable means as instructed by BHEL/customer engineer incharge. |
| 2.4 | The Customer may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works at no extra cost to BHEL. Any defect in quality of work or deviations from drawings / specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL Engineer, without any cost implication to BHEL. |
| 2.5 | The work under this contract shall be carried out as per BOQ Cum Rate Schedule. In case the description / specifications as per BOQ are found to be incomplete, Indian standard specifications shall be followed. Quantities mentioned in the BOQ cum Rate schedules are approximate only and liable for variation due to change in scope of work / variation in schedule of quantities, changes in design etc. The contractor shall undertake to execute actual quantities as per advice of BHEL Engineer and accordingly the final contract price shall be worked out on the basis of quantities actually executed at site and payments will also be regulated for the same. The quantities indicated |

| | |
|---|---|
| | against each item may vary to any extent and no compensation will be payable in variation of Individual quantity. |
| 2.6 | The complete works shall be carried out as per BOQ cum Rate schedule. If any work covered in the scope of contract cannot be executed using items available in BOQ, additional / extra items shall be made and rates for such items shall be worked out as per GCC clause 2.15.7. However, contractor shall be bound to execute all the works under the scope of the contract and decision whether an extra item is applicable or not, shall be taken by BHEL Engineer which will be binding on the contractor. |
| 2.7 | Any activity which is necessarily required for satisfactory execution of any item of BOQ in line with technical specifications shall be deemed to be included in BOQ item even if it is not described in the item description and no extra payment shall be made against such activity. |
| 2.8 | **CIVIL DISMANTLING SCOPE OF WORK**<br>1. Dismantling of existing foundation of ESP PASS-B Unit #4 and Cable Trestle & any other obstruction<br>2. Dismantling of Existing Grade Slab of ESP PASS-B Unit#4<br>3. Dismantling of Existing Floor of ESP PASS-B Unit#4<br>4. Dismantling of any other work required for associated civil, Electrical & mechanical works.<br>5. Chipping of slab or any structure required for successful completion of project<br>6. Disposal of debris/scrap to the location as per instruction of BHEL Engineer. Concrete and TMT/structure shall be disposed separately after segregation.<br><br>7. The entire work will be executed as per following specifications<br><br>I. Sketch is attached for reference. Existing footing raft of foundation may require to be intact or dismantled as per instruction of BHEL site Engineer<br>II. Latest CPWD specification (applicable for works where customer's specification is not available)<br>III. Instructions from ministry of environment issued from time to time.<br>IV. state govt., local bodies bye laws<br>V. BHEL specification<br>VI. Written instruction of BHEL engineer in charge<br><br>2. GENERAL<br>1. The drawings enclosed with this tender are intended to give the tenderer a general idea of the type and extent of work involved. The drawings are as such only indicative and not to be considered as the exact construction drawings. Further this is to be noted that the drawings and the documents furnished along with this specification are the sole property of B.H.E.L. It must not be used directly or indirectly in any way detrimental to the interest of the company.<br>2. Dismantling of Floor/existing foundation is required to carried out at various levels & at various Depths. The Dismantling may be carried out manually or by |

| | |
|---|---|
| | mechanical means depending upon meeting project schedule.<br>3. The Dismantling is carried out only in accordance with Running Civil Work with prior approval of BHEL Engineer in charge. |
| 2.9 | **Contractor's scope also includes following:** |
| 2.9.1 | Furnishing all i.e. labour, materials , supervision, construction plans, equipment, material, scaffolding, tools and plants, transport to and from the site, materials handling, fuel, electricity, compressed air, water and all other incidental items and temporary works not shown or specified but reasonably implied or necessary for the proper completion, maintenance and handing over the works, in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provided by BHEL Engineer during the course of works. |
| 2.9.2 | Supervisors / Engineers, labours and other staff, consumables etc., required for the scope of work shall be provided by the contractor. It shall be specially noted that the contractor's labour and staff may have to work round the clock to meet the completion schedules / plans, which may involve payment of considerable overtime. The contractor's quoted rates should be inclusive of all such contingencies. |
| 2.9.3 | Furnishing samples of all materials required by the engineers for testing / inspection and approval for use in the works. The samples may be retained by the engineer for final incorporation in the works.<br>Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the engineer. |
| 2.9.4 | Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that are required for all works including temporary works.<br>All the necessary certificates and licenses required to carry out this scope of work are to be arranged by the contractor then and there at no extra cost. |
| 2.9.5 | Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified. |
| 2.9.6 | The work shall conform to dimensions and tolerances given in various drawings and quality manuals provided by BHEL. If any portion of work is found to be defective in workmanship not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost, failing which the job will be carried out by BHEL by engaging other agencies / departmentally and recoveries will be effected from contractor's bill towards expenditure incurred including BHEL's overhead charges. |
| 2.9.7 | The work covered under this specification is of highly sophisticated nature requiring the best quality of workmanship, engineering and construction management. The contractor should ensure timely completion of the work. The contractor must have the adequate quantity of tools, construction aids, equipments, etc., in this possession. He must also on his rolls adequate trained, qualified and experienced supervisory staff and skilled personnel. |

| | |
|---|---|
| 2.9.8 | The scope of work will also include such other related works although they may not be specifically mentioned in the above paragraph and all such incidental items not specified but reasonably implied and necessary for completion of the job as a whole all as desired and as directed by the engineer. |
| 2.9.9 | The scope of work covered above is not a comprehensive list of items of work involved. The detail scope of work may vary considerably depending on the actual construction requirements. It is not the intent to specify herein all details of all material. Any item related this work not covered by this but necessary to complete the system will be deemed to have been included in the scope of the work. |
| 2.9.10 | The bidder scope shall also include setting up a testing laboratory in the field to carry out all relevant tests. Laboratory equipment is to be arranged by the contractor within quoted rate for conducting required material testing at site. |
| 2.9.11 | Contractor shall procure and supply the items to project site as per BHEL approved vendors, meeting the specification, Drawings and instructions of the Engineer**.** |

| | |
|---|---|
| 3.1 | Erection, Alignment of ESP Pass-B in all respect. Commissioning of ESP Pass-B and Handing Over to customer. |
| 3.2 | Wherever called for, pre-assembly of supporting structures, casing walls, Inlet outlet funnels, hoppers etc have to be done, on ground prior to erection in position. All site weld for casing, Inlet & outlet ducting connections have to be tested for establishing leak proof joints |
| 3.3 | Loading of collecting electrodes either from top or bottom, to be decided suiting site conditions, shall be done with due care as per instructions. Straightness of all collecting electrodes has to be checked on ground prior to loading in to the field. |
| 3.4 | Bundle of collecting electrodes should be handled only with special lifting beam and slings supplied for the purpose. |
| 3.5 | Vendor will arrange Huck bolting M/c with necessary auxiliaries |
| 3.6 | Clearances as prescribed amongst collecting electrodes and with casing walls have to be maintained. Spot heating of collecting electrodes, wherever called for, shall be done as part of work to achieve the required clearances. |
| 3.7 | Erection, alignment/ fixing in final position, testing & commissioning of high voltage rectifiers of ESP is in the scope of work. Filtration of Transformer Oil is in the Scope of Work if required, arrangement of Oil Filtration Machine in the scope of contractor. |
| 3.8 | Complete erection, alignment, testing, pre-commissioning and commission etc for drive motors of collecting electrodes and emitting electrode rapping mechanism is in the scope of work. |
| 3.9 | Replacement of damaged ducting at inlet and outlet of ESP Pass-B. |
| 3.10 | Expansion Joints at ESP inlet and outlet for ESP Pass-B. |
| 3.11 | AIR LEAK TEST |
| 3.11.1 | After erection of ESP and before clearing for insulation, air leak test has to be carried out. |
| 3.11.2 | BHEL shall provide air blower free of charge for this purpose. All other arrangements, handling at stores, transport, and erection, commissioning and carrying out the leakage test, attending to the leakages till satisfactory sealing / leak proofness shall be in scope of the work. Contractor shall dismantle the test equipments and return to BHEL/RVUNL stores in good condition after due reconciliation, cleaning and servicing. No separate/ additional payment is envisaged for the above. |
| 3.12 | MAIN SUPPORTING STRUCTURES, EXTERNAL STRUCTURES, ELEVATOR STRUCTURES, STAIRWAYS, GALLERIES & PLATFORMS & HANDLING ARRANGEME |
| 3.12.1 | Quality norms with regard to verticality of column have to be adhered to strictly at |

| | |
|---|---|
| | various stages of erection. |
| 3.12.2 | It is likely that, in deviation from prescribed sequence, erection of certain elements a structure may be deferred for later stage, this may necessitate temporary installation of some structural steels at appropriate locations to keep the stability of structure intact. Such temporary installations shall be removed subsequently and returned to BHEL/RVUNL stores/ storage yard. Finishing work in the related permanent structures shall be done as per the instruction of BHEL engineer. BHEL will provide necessary steels on free issue basis in random sizes for such installations, which shall be fabricated by the Contractor to suit the requirement. |
| 3.12.3 | Payment for such installations shall be made on the accepted tonnage rate of structures. No separate payment will be made for fabrication, removal & return of the materials to BHEL/ RVUNL stores. |
| 3.12.4 | In some cases, the structural material will be supplied in random lengths, which have to be fabricated to suit the requirement as incidental to work. Also, it may sometimes be necessary to remove some of the erected members to facilitate erection of bigger/ pre-assembled equipments. In such cases, the removal and re-erection of such members as agreed by the BHEL Engineer will have to be done by the Contractor as incidental to work. |
| 3.12.5 | Contractor shall arrange materials required for temporary cat ladders & working platforms during erection of columns, platforms and other structural components. Such arrangements shall, as far as possible, be only of clamping & bolting type, as welding on columns etc will not be permitted. After the completion of work these shall be removed. |
| 3.12.6 | All the hand rails and toe guards shall be provided as per drawings and site requirement. Hand rails supplied in running lengths shall be suitably cut, edge prepared and welded. Also, hand rails/ guards may have to be provided from the safety point of view In certain places though not indicated In the erection drawings. The weld joints of hand rails shall be ground smooth to flush finish. |
| 3.12.7 | The Contractor shall also install additional platforms of permanent nature for approaching different equipment as per the site requirement and to meet O&M requirements, though these may not Indicated in the erection drawings. Materials required for such platforms will be supplied by BHEL in random sizes on free Issue basis. These have to be fabricated to suit the requirement. Payment only for erected weight as certified by BHEL engineer shall be made at the rate applicable for structures. No payment is envisaged for fabrication of structures. |
| 3.13 | **Electrical & C&I works** |
| 3.13.1 | Erection and Commissioning of all electrical and C&I Supplied items of ESP in the scope of supply of BHEL Units for this project like control room inserts, cables, |

| | |
|---|---|
| | earthing, cable trays, junction box, heating elements, interlocks, auxiliary control panel, rapper control panel, statcon panel, LT switch board, ESP switch gear, Bapcon and Accessories, opacity monitor and accessories, ash level indicators etc, is in the Scope of work. |
| 3.13.2 | Installation of Cable trays/cable ducts. |
| 3.13.3 | High Voltage Bus Duct connection between the transformer rectifier and the high voltage emitting system complete with bushing insulator and disconnecting switches. |
| 3.13.4 | Erection of below and above ground earthing. |
| 3.13.5 | Various types of sheet metal, galvanized cable tray, i.e. Perforated, ladder type, seal metal duct, solid bottom tray, shall be provided in standard lengths along with accessories like hardware, bends, reducers, coupler plate, tray covers and tray damps etc. |
| 3.13.6 | Installation of cable tray/cable duct shall include cutting, laying, jointing, supporting, drilling holes in the support, providing tees/reducers/bends/damps as per tray route layout, fabrication of bends/tees/reducers from straight length, fixing of tray covers, welding of tray on support, cleaning and application of cold galvanizing paint on weld joints (supply of paint is in the scope of contractor). Installation of tray/duct covers, wherever provided, will be done as a part of tray erection and no extra rates will be payable. |
| 3.13.7 | Cable trays/ducts have to be routed underground in cable trench, over head on structure, valves, floors etc. for various applications such as cable laying, copper tubes, conduits, thermocouple, temperature gauge capillary etc. |
| 3.13.8 | Installation of Copper tubes/SS tubes/copper pipes shall include cutting into required length, laying, bending, cleaning, brazing wherever required, foxing of brass fittings like compression fittings/tees/end connectors/straight connectors/bulk heads/valves etc., supporting clamping including supply of damps and hardware, flushing and conducting leak test. |
| 3.13.9 | Cable laying (power / control / instrumentation shielded / unshielded cables / plug-in cables / coaxial / UTP / STP / data highway, armoured / un-armoured, single / multi-core, PVC/HR PVC/FRLS/TEFLON/XLP Insulation, optical fibre) |
| 3.13.10 | Cable laying includes cutting to the required length, laying in overhead/underground cable trench/through pipes/flexible conduits, dressing/damping in tray, drilling of holes In gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JBs, providing PVC numerical/alphabetical /printed ferrules, termination by using crimp type copper tinned/aluminium lugs, insulated/un-Insulated, termination (crimp, soldering, etc.), plug-in connections with Insert type crimping, providing identification PVC/aluminium cable tags (at both the ends and at |

| | |
|---|---|
| | 15 m Intervals throughout the route length and also at each bend), continuity checking, insulation resistance checking, high voltage test on HT cables. Laying, etc of Optical fibre cables on cable trays /cable trench shall necessarily be done using flexible conduit. |
| 3.13.11 | Entry to the panels and JBs may be at top, sides or bottom. All cables are required to be properly supported and clamped near to the JB/panel. |
| 3.13.12 | Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, prefab plug-in cables, etc., for such cases cables may have to be lifted inside the panel by either making cut-out in gland plate and providing rubber profile for sharp edge protection or alternatively, providing 4" or 6" PVC pipe coupling gland and these pipe coupling gland shall be supplied by contractor within the quoted rate of cable laying. |
| 3.13.13 | Copper tinned lugs of various types (pin, ring, fork, snap-on) upto 4 sq.mm, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/metallic, damping and dressing material with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. The quality of material shall be got approved from BHEL engineer prior to their use on job. All care should be taken to avoid abrasion, tension, twisting, kinking, stretching of cables during installation. |
| 3.13.14 | Cable shielding - all signal cables are supplied with bare shielded copper wire/with braided wire shield. Generally shield wire is kept isolated at instrument/field device end and continuity is maintained through JBs and grounded at panel end only. While terminating the shield wire either in panel or JBs, PVC sleeves are to be used to avoid two-point earthing. |
| 3.13.15 | Wherever cables run through ducts, conduits, valves, etc., they shall be sealed using fire/weather proof compound. In addition to this, cable entry in panels, MCCS, instruments, electrical actuators etc., are also required to be sealed. The required material for doing so shall be included by contractor in the cabling scope. |
| 3.13.16 | Many of the cable trays and cables have to be laid in cable trenches. For this purpose, the cover of the trenches have to be opened for working in site and whenever the cables are to be laid in existing cable tray, all safety precautions have to be observed. After completing the work, the trenches have to be cleaned and Covers put back into position. Contractor shall also carry out de-watering from the trenches if required and arrange pumps etc., at his cost. Looping wire at terminal block of panels and electrical actuator as shown in the interconnection diagrams or as required is to be done by contractor at no extra cost. |
| 3.13.17 | Contractor shall carefully plan the cutting schedule of each cable drum in consultation with site engineer such that wastage are minimized. |
| 3.13.18 | The erection contractor shall make every effort to minimize wastage during erection |

| | |
|---|---|
| | work. In any case, the wastage shall not exceed the following limits:<br><br>SI No. Item Wastage on issued Qty<br>1 Fabrication steel 2%<br>2 Each size of power cables 1%<br>3 Each size of control/Inst cables 2%<br>4 Impulse pipe/tubes/GI pipes/copper tube 4%<br><br>If the actual wastage be more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill. |
| 3.13.19 | Junction Boxes :<br>Different types of junction boxes are to erected by the contractor like junction boxes below 48 ways and above 48 ways. The junction boxes are to be located at the locations jointly decided at site during erection. The junction boxes are to be erected on the frames fabricated at site. |
| 3.14 | **General Scope for Electrical/ Cabling Work** |
| 3.14.1 | Cable Laying & termination between PLC panel, EC panel, MCC Panel, Transformers and different equipment / item / instruments of ESP Pass-B Unit-4. |
| 3.14.2 | |
| 3.14.3 | Power & Control cable laying & termination for different equipment's of ESP Pass-B Unit-4. |
| 3.14.4 | Cable laying shall be done from the feeder, panel, main switch gear room etc. as per requirement of system. Termination of cable shall be done by contractor at both the ends. |
| 3.14.5 | Proper laying, dressing, tagging of cables shall be done by contractor. |
| 3.14.6 | Detailed Cable Schedule along with termination details will be provided to contractor before start of electrical work. |
| 3.14.7 | All necessary certificates and licenses( If Required) required to carry out this work from competent authority like CEA, State Electricity authority are to be arranged by the contractor expeditiously at his cost. |
| 3.14.8 | Contractor is responsible for getting Electrical Inspector/statutory authority's approval (If required) for all electrical installation covered in his scope. |
| 3.14.9 | Contractor Electrical License for Extra High Voltage System (If Required) installation work from State authorities. |
| 3.14.10 | Contractor shall ensure that his premises are always kept clean and tidy to the extent possible. Any untidiness noted on the part of the contractor shall be brought to the attention of the contractor's site representative who shall take immediate action to clean the surroundings to the satisfaction of the Engineer-in- Charge. |
| 3.14.11 | Any wrong erection shall be removed and re-erected promptly to comply with the design requirements to the satisfaction of Site Engineer and no compensation shall |

| | |
|---|---|
| | be payable in case fault of contractor. |
| 3.14.12 | BHEL will provide vendor's technical support for commissioning of various proprietary type special instruments/systems. The contractor shall carry out the works as per instructions of BHEL/ Vendor Engineer. |
| 3.14.13 | Contractor shall ensure that all the documents provided to them like O&M Manuals, Manufactures Test Certificates, etc. for all instruments/equipment under calibration are stored properly and are easily accessible/producible. |
| 3.14.14 | Contractor shall calibrate all field instruments in workshop, before field installation. |
| 3.14.15 | Necessary calibration report shall be generated for each tag/instruments and approval of competent site personnel shall be taken before installation |
| 3.14.16 | Contractor shall provide necessary assistance /co-operation to other vendors for system integration, as required. |
| 3.14.17 | The contractor shall carry out trial run of all motors including checking the direction of rotation in the uncoupled condition. |
| 3.14.18 | All electrical panels, motors, Bus ducts and such other devices shall be properly dried by heating to improve IR valve, before they are energized. Bearings, slip rings commutators and other exposed parts shall be protected against moisture ingress and corrosion during storage and periodically inspected. |
| 3.14.19 | If the contractor or his workmen shall break, deface injure or destroy any part of a building, road, Serbs, fenced enclosures, water pipes, cables, drains, electric or telephone posts or wires, trees, stored components or any other property or to any part of erected equipment etc., the contractor shall make the same good at his cost or in default the Engineer may cause the same to be made good by other workmen/agency or by other means and deduct the expense (of which the BHEL Engineer's decision is final) from any sum that may be then or at any time thereafter become due to the contractor or from his security deposit or any other money due. |
| 3.14.20 | All the equipment shall be handled very carefully to prevent any damage or loss. No untested wire ropes/ slings etc. shall be used for unloading / handling. The equipment shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from the stores shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site. |
| 3.14.21 | BHEL shall have lien on all T&Ps, IMTEs & other equipment of the Contractor brought to the site for the purpose of erection, testing and commissioning. BHEL shall continue to hold the lien on all such items throughout the period of Contract. No material brought to the site shall be removed from the site by the Contractor and/or his Sub-contractors without the prior written approval of the Engineer. |
| **3.15** | **CABLE TRAYS/CABLE DUCTS** |

| | |
|---|---|
| **3.15.1** | Various types of sheet metal, galvanized cable tray, i.e. perforated, ladder type, sheet metal duct, solid bottom trays, pre-fabricated structural trays etc., will be supplied in standard lengths along with accessories and hardware viz; coupler plate, tray covers and tray clamps etc. |
| **3.15.2** | Erection of cable tray/cable duct shall include cutting, laying, jointing, fixing tee/reducers/ bends/clamps, fixing of tray covers, hardware, fabrication &welding of tray supports as per approved tray route layout etc. |
| **3.15.3** | Fabrication of bends/tee/ reducers from straight length of tray is within the scope of work and rate quoted shall be inclusive in unit rate (in running meter). All site welds of cable trays shall be painted with approved coat of primer (red lead/oil primer) and final coat of cold galvanizing/aluminum paint, which shall be arranged by the contractor. |
| **3.15.4** | In case structural cable trays, bends, tees, reducers etc., are required to be fabricated from structural steel and installed, unit rate applicable for fabrication and installation of structural steel shall be applicable in such instances. |
| **3.15.5** | Anchor fasteners of approved make or approved by BHEL engineer shall be arranged by the contractor with in the quoted rate for installation works. |
| **3.15.6** | Cable trays/duct etc. may have to be routed underground in cable trench, overhead on structure, along the walls, floors etc. |
| **3.15.7** | Installation of tray/duct covers, wherever provided, will be done as a part of tray erection and no extra rates will be payable. |
| **3.15.8** | Branch trays of 50 mm or 100 mm size trays wherever required for laying one or two cables between the field instrument and the nearest Main tray will be erected by contractor. |
| **3.15.9** | All Sharp edges and Burr shall be removed from cable trays before cable laying. |
| **3.15.10** | The cable trays shall be supported in general at a span of 1.5mtrs horizontally and at a distance of 1mtr vertically. |
| **3.15.11** | Cable Tray covers shall be provided for the top most cable trays and vertical trays. Further wherever trays crosses hydrocarbon lines, bottom covers shall be provided. |
| **3.15.12** | All the cable trays being supplied for the project are of length 3000 mm. |
| **3.15.13** | Separate colored paint strips shall be applied at every 20mtrs and each end of cable tray & branch connection and when the tray changes its direction/elevation. Also sub-branch cable trays marking not required.<br>3.3kv/ 11kv/33kv/66kv : red strips equally spaced at 20 metres interval, , 2 inch width each<br>1.1kv power cables : yellow strips equally spaced at 20 metres interval, , 2 inch width each<br>1.1kv control cables : blue strips equally spaced at 20 metres interval, , 2 inch width each |

| | |
|---|---|
| | Instrumentation cables : green strips equally spaced at 20 metres interval, , 2 inch width each. |
| **3.15.14** | CABLE LAYING - (POWER/CONTROL / INSTRUMENTATION SHIELDED/ UNSHIELDEDCABLES / PLUG-IN CABLES / Coaxial / UTP / STP /DATA HIGHWAY, ARMOURED / UN-ARMOURED,SINGLE / MULTI-CORE, PVC /HR PVC / FRLS / TEFLON / XLP INSULATION, Optical fibre) |
| **3.15.15** | Cable laying includes cutting to the required length, laying in overhead cable racks / underground cable trenches, pipes, flexible conduits, dressing/clamping in tray, drilling of holes in gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JBs, providing printed ferrules(ferrule printing machines to be provided by contractor for printing necessary cross ferruling details) / PVC numerical / alphabetical ferrules(where printed ferrules not possible at all) machine engraved ferrules sleeve/ferrule, termination by using crimp type copper tinned/aluminum lugs, insulated/un- insulated, crimp and soldered termination, plug-in connections with insert type crimping, providing identification cable tags of PVC/aluminum at both the ends and at appropriate interval ( Approximately 30meters) throughout the route length, continuity checking, insulation resistance checking. Contractor to arrange adequate numbers of his own ferrule printing machines. |
| **3.15.15** | Entry to the panels, JB's may be at top, side or bottom. All cable are required be supported and clamped near to the panel. |
| **3.15.16** | PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/metal as per site requirement, clamping and dressing material such as suitable cable ties/ clamps etc. with hardware, PVC sleeves etc. Shall be supplied by contractor within the quoted rate for cable laying. Only Cable Lugs & Glands Shall Be Issued By BHEL As Free Issue item. |
| **3.15.17** | All care should be taken to avoid abrasion, tension, twisting, kinking and stretching of cables during installation. |
| **3.15.18** | Cable shielding – all signal cables are supplied with bare shielded copper wire/with braided wire shield. Generally, shield wire is kept isolated at instrument/field device end and continuity is maintained through JBs and earthed at panel end only. While terminating the shield wire in either panel or JBs, PVC sleeves are to be used to avoid two-point earthing. |
| **3.15.19** | Wherever cables run through ducts, conduits, valves, etc., they shall be sealed using fire/weather proof compound. In addition to this, cable entry in panels, MCCs, instruments, electrical actuators etc., are also required to be sealed. The required material for doing so shall be included by contractor in the cabling. |

| | |
|---|---|
| **3.15.20** | All cable entry openings shall be properly sealed to prevent water seepage from outside trenches/conduits into the building. The required materials for doing so shall be included by Agency in the cable laying prices. |
| **3.15.21** | Contractor shall carefully plan the cutting schedule of each cable drum in consultation with BHEL site engineer such that wastages are minimized. Recovery will be made in case the wastages are exceeding the wastage allowances fixed in this contract. |
| **3.15.22** | Directly buried cables shall be laid on and covered with sand/riddle with mud protected by brick barriers at sides and pre-cast concrete slabs on top. Location of buried cables shall be indicated clearly by cable marker, made of galvanized from interval of 30 meters and at every change of direction. |
| **3.15.23** | All cables shall be provided with minimum of 2mm thick aluminium sheets as cable identification tags indicating cable designation in accordance with the cable schedule. The cable tags shall be provided at the ends, every 30mtrs and when the cable changes its direction/elevation. The tags shall be of aluminium with the number punched on it and securely attached to the cable by not less than two turns of 16 SWG GI wire. |
| **3.15.24** | All the cables shall be clamped to the cable trays/support structure with the help of clamps. All power cables shall be clamped individually and control cables shall be clamped in groups of 3 or 4 cables. Clamps for multicore cables shall be fabricated out of 25x3 mm aluminium flats. Single core power cables shall be laid in trefoil formation and suitably clamped with 25mm wide 8 SWG aluminium strips. |
| **3.15.25** | Cable trenches in plant shall be sand filled (if applicable). |
| **3.15.26** | Cost of cable laying as per BOQ Cum Rate Schedule shall include the cost of Nylon / PVC ties & Aluminium strip required for dressing / clamping. |
| **3.15.27** | Single core cables shall be laid in Trefoil configuration. HV single core cables shall be provided with screen bonding scheme. |
| **3.15.28** | Cables for different voltage grades shall be laid in independent cable trays. Separate cable trays shall be provided for control cables. |
| **3.15.29** | Conduits shall be thoroughly cleaned before pulling in the cable. |
| **3.15.30** | While laying cables, existing cable tray covers and false flooring may require to be removed and re-fixed. The same has to be done at no extra cost to BHEL. |
| **3.16** | **CABLE TERMINATION** |
| **3.16.1** | The Cost Of Cable Laying As Per BOQ Cum Rate Schedule Shall Also Include The Cost Of Termination With Suitable Crimping Type Lugs & Ferrules . |
| **3.16.2** | Only Cable Lugs (above 4sqmm) & Glands Shall Be Issued By BHEL as Free Issue Item. Drilling of holes in gland plates of control panels, JBs etc as per requirement shall also be part of cabling at no extra cost to BHEL. |
| **3.16.3** | The contractor shall carry out insulation testing, simulation testing etc. as per the instructions of Engineer at site. |

| | |
|---|---|
| **3.16.4** | Screen of signal cables shall run in insulated sleeve (to be arranged by contractor at no extra cost) and shall be terminated as per the instructions of the BHEL Engineer. |
| **3.16.5** | Name plates/Tag plates with tying/fixing material for cable's both end & filed instruments@ 100 meters per run of cable as required. |
| **3.16.6** | Each control cable core entering panel / Junction box shall be neatly dressed and served with Nylon cord to keep it in position at the terminal block. |
| **3.16.7** | All cable entry points shall be sealed and made vermin and dust proof. Unused opening, if any shall be effectively closed. |
| **3.16.8** | The location of cable Joint if any shall be clearly indicated with cable marks with an additional inscription "Cable Joint". |
| **3.16.9** | The contractor shall provide Tools/ equipment required for the connections and termination of cable wherever necessary. |
| **3.16.10** | Re-termination if required during testing/ commissioning shall be carried out without additional cost. |
| **3.16.11** | Scope of termination shall include supply of insulating sleeves. The sleeves shall be fire resistant and long enough to over pass conductor insulation. |
| **3.16.12** | Only printed ferrules should be used and contractor shall arrange necessary ferrules printer. |
| **3.17** | **JUNCTION BOXES/PUSH BUTTON STATION** |
| **3.17.1** | Different type of Electrical /Control Junction boxes/Push button boxes shall be supplied. The scope of installation of Junction boxes/Push button boxes shall be as follows: |
| **3.17.2** | Unit rate quoted for erection of junction boxes/push button boxes shall include providing necessary supports, drilling of bottom gland plates for cable glands as required, painting the tag No of JB or fixing a separate tag plate as required on junction boxes/push button boxes, minor chipping, grouting as required for mounting the JBs/PB and supply of all bolts and nuts (Fasteners) including grouting bolts as required for mounting the junction box/push button. |
| **3.17.3** | Fabrication and fixing of supports shall be on tonnage basis. |
| **3.17.4** | Contractor shall close all unused holes on the gland plates using suitable material in consultation with Site Engineer at free of cost. |
| **3.17.5** | All bolts and nuts (Fasteners) required for mounting the junction box shall be arranged by the contractor. |
| **3.17.6** | Painting of JB supports/push button station shall be in erection agency scope. Painting procedure as per main piping specification. |
| **3.17.7** | CONTRACTOR shall include painting and marking of all buses, individual incomers, all outgoing feeders etc. with details such as tag no., feeder rating, sending end source reference etc. for all switchboards. |

| | |
|---|---|
| **3.17.8** | It is CONTRACTOR's responsibility to identify and supply the safety equipment such as hand gloves, apron, eye shields, danger boards, first aid box. |
| **3.18** | **SCOPE OF BELOW and ABOVE GROUND EARTHING** |
| **3.18.1** | Earthing work mainly involves laying and tack welding of conductors on columns / beams at every one meter interval and bolted connections with equipment at least at two points. Low hydrogen content electrodes shall be used for welding. All the above ground welded joints shall be coated with two coats of red oxide primer and two coats of enamel paints. |
| **3.18.2** | Earthing scope also covers, earthing of all cable trays, metallic frames of all current carrying equipment, supporting structures adjacent to current carrying conductors, Transformer, Bus ducts, HT/LT panels, control panels, motors, JB, push button boxes etc. as required. |
| **3.18.3** | Drawings of main earth grid to be provided by others would be made available to the contractor to enable them to carry out rest of the earthing system work. |
| **3.18.4** | Below ground earthing materials shall be supplied by contractor and the contractor shall lay and connect the earthing materials as per site requirement. |
| **3.18.5** | The connection between earthing pads/ terminal to the earth grid shall be made short and direct and shall be free from kinks and splices. |
| **3.18.6** | Scope of work also includes the formation of earth pit. Earth pits shall be treated with salt and charcoal as per IS:3043 or as per approved procedure of BHEL/ CUSTOMER. |
| **3.18.7** | All junction boxes, receptacles, switch boxes, lighting fixtures, conduit etc. shall be earthed in compliance with the provision of I.E. rules and applicable Indian Standard amended up to date. |
| **3.18.8** | The earth resistance values for electrical system shall be demonstrated at site in presence of Engineer-in-charge. In case additional electrodes are required to meet the requirement, same shall be provided. |
| **3.18.9** | The plant earthing system will be designed as per the requirement of IEEE - 80 & IEEE-142, IS – 3043, Indian Electricity Rules and CBIP Guidelines. |
| **3.18.10** | At specified intervals. Separate grid shall be provided for Electronic Grounding. |

| | |
|---|---|
| 4.1 | All the Welding, Heat-Treatment, Radiography and NDT WELDING HEAT TREATMENT, RADIOGRAPHY AND NON- DESTRUCTIVE TESTING (MPI, DPT etc.) shall be in the scope of Contractor. |
| 4.2 | All welders including tack welders, structural and high pressure welder shall be tested as per ASME section IX/ IBR and approved by BHEL Engineer before they are actually engaged on work even though they may possess a valid IBR certificate. BHEL reserves the right to reject any welder welder's performance is not found to be satisfactory. The contractor shall maintain the records of qualification and performance of welders. BHEL Engineer will issue all the welders qualified for the work, an Identity card. The welder will keep the same with him at work place at all times. He may be stopped from work if he is not found in possession of the same. |
| 4.3 | Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection in the joints welded by him. The welder's is having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance. |
| 4.4 | Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor's expense. The Engineer prior to any repair being made shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the quality engineer. |
| 4.5 | All expenses for testing of contractor's welders including destructive and non-destructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. Limited quantity of tube and pipe material required for making test pieces will be supplied by BHEL free of cost. |
| 4.6 | The regulators used on welding machines shall be calibrated before putting these into use for work. The Contractor at his cost shall also arrange periodic calibration for the same. |
| 4.7 | **Only BHEL/ BHEL's client approved electrodes and filler wires specifically approved / applicable to this project will be arranged and used by the contractor**, within the finally quoted price. BHEL reserves the right to test any approved electrode being used by the contractor. Testing charges for the same shall be borne by the contractor, All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number/ batch number given on electrode packets, No electrodes will be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved/ accredited test house traceable to National/ International standards will be submitted to BHEL before putting the oven in use. The |

| | |
|---|---|
| | contractor shall also arrange periodical calibration for the same. |
| 4.8 | All butt/ fillet welds shall be subject to dye penetration test/ other tests as per the instructions of the engineer at no additional cost. |
| 4.9 | The contractor shall maintain a record in the form as prescribed by BHEL of all operations carried out on each weld. He has to maintain a record Indicating the number of welds, the names of welders who welded the same, date and time of start and completion, preheat temperature, radiographic results, rejection if any, percentage of rejection etc. and submit copies of the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability or other wise of the welds shall be final. |
| 4.10 | The contractor shall carry out the edge preparation of weld joints at site in accordance with the details acceptable to BHEL Engineer. Wherever possible machining or automatic flame cutting should be done. Gas cutting will be allowed only wherever edge preparation otherwise is impractical. All slag/ burrs shall be removed from the edge and all the hand cuts shall be ground smooth to the satisfaction of engineer. |
| 4.11 | All welds shall be painted with anticorrosive red oxide paint once radiography and stress reliving works are over. Necessary consumables and scaffolding etc including paints shall be provided by contractor at his own cost. |
| 4.12 | Pre-heating, radiography and other NDT tests, post heating and stress relieving after welding of tubes, pipes, including attachment welding wherever necessary, are part of erection work and shall be carried out by the contractor in accordance with the instructions of the Engineer. Contractor at his cost shall arrange all equipment and consumables essential for carrying out the above process. |
| 5.13 | Contractor shall arrange all necessary stress relieving equipment with automatic recording devices, if applicable. The contractor shall arrange for labour, heating elements, thermocouples, thermo-chalks, temperature recorders, thermocouple attachment units, graphs, sheets insulating materials like asbestos doth, ceramic beads, asbestos ropes etc. required for heat treatment/ stress-relieving operations. The contractor should take a note of the following: |
| 4.13.1 | Temperature shall be measured by thermocouple and recorded on a continuous printing type recorder. All the recorded graphs for heat treatment works shall be the property of BHEL. |
| 4.13.2 | All stress relieving equipment will be used after due calibration and submission of test certificate to BHEL. Periodic calibration from Govt. Approved/ accredited Test Houses traceable to National/ International standards will also be arranged by the contractor for such equipment at his cost. |
| 4.13.3 | The contractor shall obtain the signature of Engineer or his representative on the strip |

| | |
|---|---|
| | chart of the recorder prior to the starting of SR operations.. |
| 4.14 | The contractor shall also be equipped for carrying out other NDT like LPI/ MPI/ Ultrasonic testing/ Hardness test etc. as required as per welding schedules/ drawings within the finally accepted price/ rates |
| 4.15 | The technical particulars, specification and other general details for radiography work shall be in accordance with ASME, IBR or ISO as specified by BHEL. |
| 4.16 | The contractor for radiography work shall use Iridium-192 or any other radiographic source required. The geometric un-sharpness shall not exceed 1.5 mm. The contractor should take adequate safety precautions while carrying out radiography. Contractor at his cost shall arrange necessary safe guards required for radiography (including personnel from BARC). |
| 4.17 | Low speed high contrasts, fine grain films (D-7 or equivalent) in 10 am width only be used for weld joint radiography. Film density shall be in between the range of 1.5 to 2.0. |
| 4.18 | All radiographs shall be free from mechanical, chemical or process marks, to the extent they should not confuse the radiographic image and defect finding. Penetrameter as per ASME or ISO must be used for each exposure. |
| 4.19 | Lead numbers and letters are to be used (generally 6mm size) for identification of radiographs. Contract number, jolnt identification, source used, welder's identification and SFD are to be noted down on paper cover of radiograph. |
| 4.20 | Lead intensifying screens for front and back of the film should be used as per the above-referred ASME specification. |
| 4.21 | The joint is to be marked with permanent mark A, B, C to identify the segments. For this a low stress stamp shall be used to stamp the pipe on the down streamside of the weld. |
| 4.22 | For multiple exposures on pipes, an overlap of about 25-mm of film should be provided. Radiography personnel with sufficient experience and certified by M/s BARC for conducting radiographic tests in accordance with safety rules laid down by Division of Radiological protection only have to be deployed. These personnel should also be registered with DRP/ BARC for film badge service. |
| 4.23 | All arrangements for carrying out radiography work including dark room and air conditioner and other accessories if required shall be provided by contractor within the space allotted for office at his cost. As an alternative the contractor may deploy an agency having all above facilities and who are duly approved/ accredited by BARC and/ or other Regulatory authorities. Detailed particulars of such agencies will be submitted and got approved by BHEL Engineer before the actual deployment of agency for radiography work. |
| 4.24 | Contractor shall note that radiography will be as per approved quality plan. |

| | |
|---|---|
| | Subsequently radiographic inspection will be done on the basis of quality of welding. However minimum percentage of joints to be radiographed shall not be less than the requirement of BHEL welding schedule/ IBR/ Customer's requirements. The percentage may be increased depending upon the quality of joints and at the discretion of BHEL. However other NDT test as called for in the FQP including LPI, MPI, UST and HT will have to be carried out and the cost shall be borne by Contractor. |
| 4.25 | All the Radiographs shall be properly preserved and shall become the property of BHEL. They are to be reconciled with the work done, joints radiographed and submitted to BHEL/ customer. |
| 4.26 | Since radioisotopes are being used, all precautions and safety rules as prescribed by BHEL/ BARC/ Customer shall be strictly followed. BARC/ DRP certificate to be provided before taking up the work. |
| 4.27 | Radiography of joints shall be so planned after welding, that the same is done either on the same day or next day of the welding to assess the performance of HP welders. If the performance of welder is unsatisfactory, he is to be replaced immediately. |
| 4.28 | Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re- submitted for evaluation. |
| 4.29 | However, if the defect persists after first repair, further repair work followed with radiography shall be repeated till the joint is made acceptable. In case the joint is not repairable, the same shall be cut, re-welded and re- radiographed at contractor's cost. |
| 4.30 | If the contractor does not carry out radiography work due to non-availability of source/ film/ chemical/ operator etc., BHEL will get the work done departmentally or through some other agency at the risk and cost of the contractor. |
| 4.31 | Heat treatment and radiography may be required to be carried out at any time (day and night) to ensure the continuity of the progress. The contractor shall make all necessary arrangements including labour, supervisors/ Engineer required for the work as per directions of BHEL. |
| 4.32 | The contractor shall assist BHEL Engineer in preparing complete field welding schedule for all the field welding activities to be carried out in respect of piping and equipment erected by him involving high pressure welding at least 30 days prior to the scheduled start of erection work at site. The contractor shall strictly adhere to such schedules. |

| | |
|---|---|
| 5.1 | All attachment welding, including welding of hooks/ supports as per pitch both on equipment and piping shall be done as directed by Engineer. Attachment welding shall have to be done by certified welders. If necessary contractor may have to cut the hooks to correct length without any extra cost to BHEL. |
| 5.2 | Contractor has to supply and apply heat resistant primer on welded portions before application of Insulation. |
| 5.3 | The mineral wool mattresses (bonded/ un-bonded)/ LRB mattresses are received at site in standard sizes. These are to be dressed/ cut to suit site requirements by the contractor. |
| 5.4 | The number of layers/ thickness of mineral wool/ LRB mattresses for auxiliaries, pipe lines, valves and other vessels shall be as per various drawings and as directed by Engineer. For applying the mineral wool mattress, the required holding materials, if necessary by fabrication of rings/ hooks shall be fixed as directed and as per drawings and spec. |
| 5.5 | The contractor should ensure, proper finishing of surface of the insulation and sheeting. |
| 5.6 | The contractor should ensure that the finished surface of the Insulation works conforms to the dimensions and tolerances given in the drawings. Aesthetic finish and accuracy of work are most important. |
| 5.7 | It is the responsibility of the contractor to ensure that the insulation materials and sheet metal covering issued to him for application are well protected against loss or damage from weather conditions. Closed/ semi closed sheds or any other arrangements required for this will be made by him at his cost. If any damage occurs to the material due to improper storage or due to any causes attributable to the contractor except for normal breakage or damages allowed in such cases, the cost of such damaged material shall be to the account of the contractor. |
| 5.8 | Aluminium sheet cladding will be fabricated to the sizes and shapes specified in drawings. Beading, swaging, beveling of sheets, crowning the sheets if necessary will **carried out by him.** Two coats of anti-corrosive black bituminous paint are to be applied on inner surfaces of the cladding. Bitumen sealing compound on the joints if necessary is included in the scope of this work. **Contractor may note that they will also supply anti-corrosive black bituminous paint and bituminous sealing compound required for above works at his cost. However, if any material is received from the unit, the same shall be issued free of cost to the contractor**. |
| 5.9 | Aluminium sheet metal dadding over insulation will consists of plain/ ribbed/ corrugated sheets. The sheets will be supplied in standard sizes. Cutting them to required size, grooving, fabricating bends, boxes etc, for proper covering is contractor's responsibility. Any cutting/ bending/ welding of fabricated skin casing sheets if required will also be |

| | |
|---|---|
| | covered within the scope of this contract. |
| 5.10 | A logbook shall be maintained by the contractor to obtain clearance for application of insulation. If the contractor does the work on his own accord without prior permission the area may have to be redone at his cost. |
| 5.11 | Contractor is liable for the exact accounting of the material issued to him and he shall make any unaccountable losses good. Wastage allowance for the material issued are as below:<br><br>Wool / LRB mattresses and cladding sheets... 2%<br><br>Insulation bricks and mortar.....2% |
| 5.12 | The entire surplus, unused materials etc., supplied by BHEL shall be returned to BHEL after the work is over. Materials like gunny bags and packing materials, empty containers may be returned at periodical intervals. |
| 5.13 | The contractor shall leave certain gaps and opening while doing the work as per instructions of BHEL engineer to facilitate inspection during commissioning and to fix gauges, fittings and instruments. The gaps will have to be finished as per drawings at a later date by the contractor at his cost. |
| 5.14 | If during erection and commissioning any of the parts are to be temporarily fixed and then replaced by permanent ones at a later date or if any of the parts are to be removed for modification, rectification, adjustment and then refitted or if some parts are to be opened for inspection and checking and for measurement of metal surface temperature the same may necessitate removal and re-application of insulation and sheet metal cladding, which shall be done by the contractor and the erection rate quoted shall be inclusive of such contingencies. . |
| 5.15 | Removable type of insulation shall be provided for valves, fittings, expansion joints etc as per the drawings or as directed by BHEL Engineer. |
| 5.16 | All temporary pipelines required during testing, pre-commissioning and commissioning should be insulated as directed by BHEL at no extra cost to BHEL. However required insulation material shall be issued by BHEL free of Cost. |
| 5.17 | Insulation of expansion joints, dampers, etc shall be carried out after NDT/ gas tightness test is completed. |
| 5.18 | Special type of Insulation wool used in pent house shall not be cut indiscriminately. |
| 5.19 | Contractor shall apply insulation as per the instructions of BHEL Engineer. The contractor shall provide the required quantity of wire nails, planks for insulation. |
| 5.20 | Making structural supporting work for insulation during application forms a part of this |

| | |
|---|---|
| | work. |
| 5.21 | Day to day cleaning of insulation debris and scraps to be ensured by the contractor, Excessive wastage will attract cost recovery. |

| | |
|---|---|
| 6.1 | All exposed metal parts of the equipment, structure, auxiliaries, piping, and other items (covered within the scope of this contract) after installations are to be painted. The surfaces are to be thoroughly cleaned of all dirt, rust, scales, grease, oils and other foreign materials by wire brushing, scrapping, any other method as per requirement of BHEL and RVUNL. The same will be inspected and approved by the engineer before painting.<br>Painting shall be done as per approved painting scheme of BHEL (painting scheme will be provided during execution of work). |
| 6.2 | Mostly the equipment/ items/ components will be supplied with one coat of primer paint and one coat of finish paint. However during storage and handling, the same may get peeled off/ deteriorate. All such surfaces are to be thoroughly cleaned and to be touch up painted with suitable approved primer and finish paint matching with shop paint/ approved final colour. Besides above two coats of approved primer paint is to be applied on all the bare/ unpainted surfaces. The gas cut stubs would require being ground and rounded. |
| 6.3 | After applying the primer paints, wherever required, all structure/ equipment/ items, shall be finish painted with paints as specified by BHEL engineer. The number of coats/ paint thickness shall be as indicted in the drawing/ documents. However at least two coats of finish painting is to be applied. In case proper finish is not obtained in two coats, the contractor shall apply additional coat (s) till proper finish/ paint thickness is achieved. Certain equipment/ Items are required to be painted with approved quality heat resistant paint/ primer. After completion of painting all bright spots shall be cleaned to the satisfaction of Engineer. |
| 6.4 | Certain equipment like control panels, valves etc. shall require spray painting. The contractor shall make arrangements of the required equipment for spray painting. Spray painting at the job site shall be permitted only at times and locations approved by Engineer. |
| 6.5 | **Contractor at no extra cost to BHEL shall supply all specified paints (enamel, epoxy, heat resistant or of any other approved specifications applicable to this project), thinners and primers as per drawing, documents and specifications what so ever; tools consumables including scaffolding materials required for finish painting**. Paint is to be BHEL/ RVUNL approved make only and painting should be as per colour scheme and quality approved/ specified by BHEL Engineer. Valid Test Certificate for the paint so supplied shall be made available before use of the same on work. The paints for ESP parts/ structures shall be applied as per the drawing, documents, specifications and approved by BHEL or its customer as mentioned above for finish painting. The contractor has to supply and apply the paints for exposed structural parts and other components mainly due for supporting structure of ESP, Hopper approach platforms and stringers for stairs case and guard plates covered under various PGMA. All the parts of ESP are to be painted as per approved painting schedule on the parts/ specifications within the awarded price of this contract. Painting shall not be required for the parts |

| | |
|---|---|
| | covered with thermal insulation. |
| 6.6 | The contractor may be required to fill up dents/ marks by applying putty before final painting of equipment. All materials and arrangements have to be made within quoted lumpsum price/ rates. |
| 6.7 | The contractor shall provide legends with direction of flow on equipment and piping in size specified by Engineer. Letter writing shall be done in Hindi/ English or In both languages. |
| 6.8 | The painters have to under go test and only qualified painters will be allowed to work. |

| | |
|---|---|
| 7.1 | The contractor shall carry out all the required tests and pre - commissioning and commissioning activities required for their successful and reliable operation . These would include clean air flow test , air tightness test or other tests as instructed by BHEL using contractors own consumables , labour and scaffoldings etc.. |
| 7.2 | All required tests ( Mechanical and electrical ) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications . These tests / activities may not have been listed in these specifications . |
| 7.3 | Commissioning of ESP shall involve required tests such as air leak test , gas distribution test , motor no load test , rapping mechanism trial runs , interlock tests , charging of transformer fields , commissioning of all electrical equipment / panels , heaters and their proper tuning etc. The contractor shall provide all consumables , labour , scaffoldings and items required for satisfactory testing . |
| 7.4 | All the tests may have to be repeated till all the equipment satisfy the requirement / obligation of BHEL at various stages . The contractor shall do all the repairs for site - welded joints arising out of the failure during testing . |
| 7.5 | The scope of pre - commissioning activities cover installation of all necessary equipment including temporary piping , supports , valves , blanking , air blower, with access platforms , along with accessories required for AIR tightness test . |
| 7.6 | The contractor may note that no separate payment shall be released for any and commissioning tests . temporary works that are to be carried out for conducting pre - commissioning and commissioning test. Bidders are advised to include expenses on temporary works along with the rates quoted by them. Broadly the work systems will be divided as under : |
| 7.7 | Erection etc. of blowers and blanks and putty required for conducting air tightness test and GD Test are to be installed . ( Putty to be procured by contractor ) . |
| 7.8 | Dismantling of the temporary equipment will be done by the agency that has erected the equipment . He will also return the equipment to the stores . Commissioning of the ESP will involve trial run of all the equipment erected . |
| 7.9 | It shall be the responsibility of the contractor to provide various categories of workers in sufficient numbers along with Supervisors during Pre - commissioning , commissioning and post commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over . The contractor will provide necessary consumables , T & PS , IMTES etc. , and any other assistance required during this period . Association of BHEL's / Client's staff during above period will not absolve contractor from above responsibilities . |

| | |
|---|---|
| 7.10 | It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL Engineers and hence overtime payment by the contractor to his employees may be involved . The contractors finally accepted rates should be inclusive of all these factors also . |
| 7.11 | In case , any rework is required because of contractor's faulty erection , which is noticed during pre - commissioning and commissioning , the same has to be rectified by the contractor at his cost . If any equipment / part is required to be inspected during pre - commissioning and commissioning , the contractor will dismantle / open up the equipment / part and reassemble / redo the work without any extra claim . |
| 7.12 | During commissioning , opening / closing of valves , changing of gaskets , realignment of rotating and other equipment , attending to leakage and adjustments of erected equipment may arise . The finally accepted price / rates shall also include all such work . |
| 7.13 | In case any defect is noticed during tests , trial runs and commissioning such as loose components , leakage, undue noise or vibration , strain on connected equipment necessary corrective measures . etc. , the contractor shall immediately attend to these defects and take If any readjustment and realignment are necessary , the contractor at his cost shall do the same as per Engineer's instructions Including repair , rectification and replacement work. The parts to be replaced shall be provided by BHEL . |
| 7.14 | Cleaning and servicing of all the filters / strainers , toppings of oils coming in the system shall be done by the contractor within the accepted price . |
| 7.15 | At the time of each inspection , the contractor shall take note of the decisions / changes proposed by the Engineer and incorporate the same at no additional cost . The contractor shall carry out any other test as desired by BHEL Engineer / Manufacturer on erected equipment covered under scope of this contract during testing and commissioning to demonstrate the physical completion of any part or parts of the work performed by the contractor . |

**SPECIAL INSTRUCTIONS FOR SUB-CONTRACTOR**

| Sl. No. | Description |
|---|---|
| 8.1 | Time Schedule from Zero date/effective date to completion of Entire work as detailed in the tender specifications: **10 months** |
| 8.2 | All consumables including BHEL approved electrodes, filler wires, gases like DA, Oxygen and Argon etc. shall have to be arranged by the sub- contractor. LPG gas is strictly prohibited inside plant for cutting. |
| 8.3 | Huck-Bolting Machines wherever required shall be carried out by sub-contractor including arrangement of sufficient no. of Huck bolting machines in good working condition. |
| 8.4 | Sufficient T&P including but not limited to Crane of suitable rating, Hydra, Trailer, winches, chain pulley blocks, hook chucks, Grinder Mixture, Pneumatic Jack Hammer, JCB, Flori, Oil centrifuging machine etc. and other electrical testing equipment's required for carrying out the work as per site requirement shall be arranged by the sub-contractor free of cost. |
| 8.5 | All welding shall be carried out by the sub-contractor as per BHEL norms. |
| 8.6 | All scaffolding material & approach platforms required for carrying out the work shall be arranged by the sub-contractor. |
| 8.7 | Sub-contractor shall ensure use of only calibrated Inspection, Measuring & Testing equipments (i.e. measuring tape, Vernier callipers, temperature recorder, multimeter, megger etc.) confirming traceability to national standards. This applies to the thermostats of the electrode baking/ heating ovens also. Valid calibration certificates shall accompany these equipments. |
| 8.8 | Transportation of materials from RRVUNL stores to site/fabrication yard and scrap from site to scrap yard, including making all necessary arrangements e.g. 15 T Hydra crane, tractor trailor (including fuel, operator, lubricating oil, filter etc.) for the same, shall be done by the sub-contractor. |
| 8.9 | The subcontractor shall have to arrange all flood lights, required for day/night working, electric boards with fuse & earthing separate for 15 amp & 63 amp connections., including arrangement for DC Lighting for work inside ESP. |
| 8.10 | Arrangement of Dye Penetration Test kit wherever required, shall be done by the sub-contractor. |
| 8.11 | Sub-contractor shall attend to any defects noticed during air tightness test & ESP field charging and commissioning. |
| 8.12 | The work shall be carried out in three shifts. The contractor shall make an arrangement that his authorized representative or authorised signatory/site incharge shall be available round the clock at a specific location to take up job (on all days including Sundays and gazetted holidays).Deployment of sufficient and skilled manpower shall be ensured by sub-contractor for supervision, timely completion and maintaining quality of work, round-the –clock including Sundays and Holidays. |
| 8.13 | During execution of work, removal of any obstructive structure and restoration for the same is the part of contract and without any charge will be carried out immediately. |

| | |
|---|---|
| 8.14 | Sub-contractor shall ensure for engaging separate gangs in each area for timely & successful completion of work as per instruction of BHEL. |
| 8.15 | Any other work not specifically mentioned in the above scope of work but required to be carried out for completion of above work shall be in the scope of sub-contractor. |
| 8.16 | Cement supplied by Contractor shall be BIS approved make/BHEL approved make.. |
| 8.17 | TMT, Cement etc. supplied by contractor shall be of BHEL approved make manufacturers. |
| 8.18 | Assistance/support shall be provided by contractor during testing/commissioning of control room panels/existing system. |
| 8.19 | Contractor should ensure all safety precaution during execution of work in Civil, Mechanical & Electrical area. All safety equipments like safety shoes, safety helmet, safety belt, nose mask for insulation, hand gloves, Torch, caution tape etc. shall be brought by Sub-contractor |
| 8.20 | Accommodation and transport for Staff and workers of sub-contractor shall be in scope of sub-contractor. |
| 8.21 | BOCW act is not applicable for this Project. |