

# **E-TENDER SPECIFICATIONS**

## **BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282/PKG-B/2283**

S. No.	Package	E- TENDER SPECIFICATION NUMBER
01	Package-A	BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282
02	Package-B	BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-B/2283

### **FOR**

**PACKAGE-A:** Civil and Architectural works of Main plant FGD Civil Works of Unit # 1, 2 & 3 (3X200 MW) including Civil Works of Fire Protection System, Misc. Tanks, Misc. Pump House & Sump, Pipe/ Cable Rack, duct supports, Road, Drains, Water Supply, Sanitation etc. Civil and Architectural Works of common facilities /structures e.g., Lime Handling System, Gypsum Handling System, Misc. Tanks, Misc. Pump House & Sump etc. Construction of (1 no of 240M Height for Unit # 1, 2 & 3 and 1 no of 150M height for Unit#5 ) RCC Single Flue Chimney complete in all respect including RCC Works, Fabrication & Erection of Steel Flue Cans, Installation of Borosilicate Glass Block Lining on inner surface of Steel Flue Can, Supply, Fabrication and Erection of Mini Shell of Titanium as per specification, Erection of Shop Fabricated Structural Platforms, Supply & Installation of Electrical Items in conformity with the approved Layout etc to complete the Chimney in all respect. at **NTPC Ramagundam TPS Stage-I & II (3x200MW + 3x500MW) FGD Package.**

**and**

**PACKAGE-B:** Civil and Architectural Works of Main Plant FGD Civil Works of Unit#4 (1X500MW), Unit#5 (1X500MW) & Unit#6 (1X500MW) including Civil Works of Fire Protection System, Misc. Tanks, Misc. Pump House & Sump, Pipe/ Cable Rack, Duct Supports, Road, Drains, Water Supply, Sanitation etc. Civil and Architectural Works of common facilities /Structures e.g. FGD Control Room, ACW Pump House, Road, Drains, Water Supply, Sanitation etc. Construction of (1 no of 150M height for Unit#4 & 1 no of 150M height for Unit#6) RCC Single Flue Chimney complete in all respect including RCC Works, Fabrication & Erection of Steel Flue Cans, Installation of Borosilicate Glass Block Lining on Inner surface of Steel Flue Can, Supply, Fabrication and Erection of Mini Shell of Titanium as per Specification, Erection of Shop Fabricated Structural Platforms, Supply & Installation of Electrical Items in conformity with the approved layout etc to complete the Chimney in all respect. at **NTPC Ramagundam TPS Stage-I & II (3x200MW + 3x500MW) FGD Package.**

## **VOLUME I – TECHNICAL BID**

### **THIS TENDER SPECIFICATION CONSISTS OF:**

<b>Notice Inviting Tender</b>	
<b>Volume-IA</b>	<b>Technical Conditions of Contract</b>
<b>Volume-IB</b>	<b>Special conditions of Contract</b>
<b>Volume-IC</b>	<b>General conditions of Contract</b>
<b>Volume-ID</b>	<b>Forms &amp; Procedures</b>
<b>Volume-IE</b>	<b>Technical Specification and Plot Plan</b>
<b>Volume II</b>	<b>Price Bid</b>



**Bharat Heavy Electricals Limited**  
(A Government of India Undertaking)  
Power Sector - Western Region  
345-Kingsway, Nagpur-440001

CONTENTS		
Volume No	Description	Hosted in website bhel.com (Briefly) and detailed in BHEL e-Procurement Portal as files titled
NIL	Tender Specification Issue Details	(Part of <b><u>Vol-IA-2282-2283</u></b> )
NIL	Notice Inviting Tender	(Part of <b><u>Vol-IA-2282-2283</u></b> )
I-A	Technical Conditions of Contract	Vol-I-A-2282-2283
I-B	Special Conditions of Contract	Vol-I-BCD-2282-2283
I-C	General Conditions of Contract	(Part of Vol-I-BCD-2282-2283)
I-D	Forms & Procedures	(Part of Vol-I-BCD-2282-2283)
I-E	Technical Specification and Plot Plan	Vol-IE-2282-2283
II	Price Bid Specification as specified in E-Procurement Portal	Volume-II-2282

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### **FOR**

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**EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender**

**LAST DATE FOR                      Refer Notice Inviting Tender  
TENDER SUBMISSION**

**THESE TENDER SPECIFICATION DOCUMENTS CONTAINING VOLUME-I AND VOLUME- II ARE ISSUED TO:**

**M/s. ....**

**.....**

**PLEASE NOTE:  
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.**

**For Bharat Heavy Electricals Limited**

**AGM (Purchase)**

**Place: Nagpur**

**Date:**

2282-  
2283

# NOTICE INVITING TENDER

Bharat Heavy Electricals Limited



**BHEL PSWR**  
**Notice Inviting Tender**

**E-Tender Spec No: BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282/PKG-B/2283 Page 5 of 143**

Date: 04/05/2020

**NOTICE INVITING E-TENDER (NIT)**

**NOTE: BIDDER MAY DOWNLOAD/ UPLOAD THE TENDER/ OFFER FROM/ON BHEL E-PROCUREMENT PORTAL → <https://bhel.abcprocure.com>**

**To,**

Dear Sir/Madam,

**Sub : NOTICE INVITING E-TENDER**

Offers are invited in two part bid system from reputed & experienced bidders (meeting [PRE QUALIFICATION CRITERIA](#) as mentioned in Annexure-I) through **E-procurement portal → <https://bhel.abcprocure.com>** only for the subject job by the undersigned on behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender documents. Following points relevant to the tender may please be noted and complied with:

**Note: *The bidder should respond by submitting their offer online only in our e-Procurement platform at <https://bhel.abcprocure.com>. No Hard copy bid/ bids through email/ fax shall be accepted.***

**1.0 Salient Features of NIT**

S No.	ISSUE	DESCRIPTION
i	E-TENDER NUMBER	<b>BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282/PKG-B/2283</b>
ii	Broad Scope of job	<b><u>PACKAGE-A:</u></b> Civil and Architectural works of Main plant FGD Civil Works of Unit # 1, 2 & 3 (3X200 MW) including Civil Works of Fire Protection System, Misc. Tanks, Misc. Pump House & Sump, Pipe/ Cable Rack, duct supports, Road, Drains, Water Supply, Sanitation etc. Civil and Architectural Works of common facilities /structures e.g., Lime Handling System, Gypsum Handling System, Misc. Tanks, Misc. Pump House & Sump etc. Construction of (1 no of 240M Height for Unit # 1, 2 & 3 and 1 no of 150M height for Unit#5 ) RCC Single Flue Chimney complete in all respect including RCC Works, Fabrication & Erection of Steel Flue Cans, Installation of Borosilicate Glass Block Lining on inner surface of Steel Flue Can, Supply, Fabrication and Erection of Mini Shell of Titanium as per specification, Erection of Shop Fabricated Structural Platforms, Supply & Installation of Electrical Items in conformity with the approved Layout etc to complete the Chimney in all respect. at NTPC Ramagundam TPS Stage-I & II (3x200MW + 3x500MW) FGD Package. <b>and</b> <b><u>PACKAGE-B:</u></b> Civil and Architectural Works of Main Plant FGD Civil Works of Unit#4 (1X500MW), Unit#5 (1X500MW) & Unit#6 (1X500MW) including Civil Works of Fire Protection System, Misc. Tanks, Misc. Pump House & Sump, Pipe/ Cable Rack, Duct Supports, Road, Drains, Water Supply, Sanitation etc. Civil and Architectural Works of common facilities /Structures e.g. FGD Control Room, ACW Pump House, Road, Drains, Water Supply, Sanitation etc. Construction of (1 no of 150M height for Unit#4 & 1 no of 150M height for Unit#6) RCC Single Flue Chimney complete in all respect including RCC Works, Fabrication & Erection of Steel Flue Cans, Installation of Borosilicate Glass Block Lining on Inner surface of Steel Flue Can, Supply, Fabrication and Erection of Mini Shell of Titanium as per Specification, Erection of Shop Fabricated Structural Platforms, Supply & Installation of Electrical Items in conformity with the approved layout etc to complete the Chimney in all respect. at NTPC Ramagundam TPS Stage-I & II (3x200MW + 3x500MW) FGD Package.
iii	DETAILS OF TENDER DOCUMENT	

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Website: [www.bhel.com](http://www.bhel.com)

**BHEL PSWR**  
**Notice Inviting Tender**

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S No.	ISSUE	DESCRIPTION	
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-IE	Technical Specification and Plot Plan	Applicable
F	Volume-II	Price Bid as specified in E-Procurement Portal	Applicable
iv	Issue of Tender Documents	From <a href="https://bhel.abcprocure.com">https://bhel.abcprocure.com</a> (Tender documents will be available for downloading from BHEL e-Procurement website till due date of submission) Brief information of the tender shall also be available at Central Public Procurement portal ( <a href="https://eprocure.gov.in">https://eprocure.gov.in</a> ) and BHEL website ( <a href="http://www.bhel.com">www.bhel.com</a> ).	Applicable
v	DUE DATE & TIME OF OFFER SUBMISSION	<b>Date: 25/05/2020, Time: 15.00 Hrs</b> <b>Place: on E-Tender Portal <a href="https://bhel.abcprocure.com">https://bhel.abcprocure.com</a></b>  • Offer to be submitted online only through e-procurement Portal	Applicable
vi	OPENING OF TENDER (Techno-Commercial Bid)	<b>Date: 25/05/2020, Time: 16.00 Hrs</b> Notes: (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. (2) <b>This tender being an e-tender, it shall be opened online only through the E-Procurement Portal. Participating bidders may witness the Opening online only.</b>	Applicable
vii	EMD AMOUNT	<b>Rs. 72,00,000/- (Rupees Seventy-Two Lakhs only)</b> <b>[To be submitted in the form and manner as mentioned below]</b>  <b>Important Note: Bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC.</b>	Applicable
viii	COST OF TENDER	<del>Rs 2000/-</del> <b>[To be submitted in the form and manner as mentioned below]</b>	Applicable
ix	LAST DATE FOR SEEKING CLARIFICATION	Three days before the due date of offer submission. Along with soft version also, addressing to undersigned & to others as per contact address given below.	Applicable
x	SCHEDULE OF Pre Bid Discussion (PBD)	-----	Not Applicable
xi	INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)	<b>Shri Arun Chandra Verma, IPS (Retd.)</b> <b>and</b> <b>Shri Virendra Bahadur Singh, IPS (Retd.)</b>  (Please refer Annexure-04 "Important Information" of NIT for more details)	Applicable

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S No.	ISSUE	DESCRIPTION
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 ( <a href="http://www.bhel.com">www.bhel.com</a> -->Tender Notifications →View Corrigendum), Central Public Procurement portal ( <a href="https://eprocure.gov.in">https://eprocure.gov.in</a> ) & on e-tender portal <a href="https://bhel.abcpocure.com">https://bhel.abcpocure.com</a> 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 **digitally** signed on each page, 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 ~~Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Nagpur issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day. Copy of Cash receipt or the proof of Demand Draft duly **digitally** signed is to be uploaded with the Techno Commercial offer on e-tender portal <https://bhel.abcpocure.com>. However Original Demand Draft shall be sent to the officer inviting tender within a reasonable time failing which the offer is liable to be rejected. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at \_\_\_\_\_, Sundays and second/last Saturdays.~~
- 4.0 Unless specifically stated otherwise, bidder shall deposit EMD as per the provisions in General Conditions of Contract Clause no. 1.9.1. In case of remittance of EMD through **Demand Draft/Pay Order**, same shall be in favour of **Bharat Heavy Electricals Ltd**, payable at Nagpur. **In case of remittance of EMD through Bank Guarantee (for the balance EMD amount in excess of Rs 2 Lakhs) OR through FDR**, refer General Conditions of Contract Clause no. 1.9.1(iv). Proforma of Bank Guarantee for Earnest Money shall be as provided in Vol-ID "FORMS & PROCEDURES". For other details and for 'One Time EMD' please refer General Conditions of Contract.

In case of remittance of EMD through Electronic Fund Transfer, Bank account details of BHEL PSWR to be used is as below: -

NAME OF THE COMPANY	BHARAT HEAVY ELECTRICALS LTD
ADDRESS OF THE COMPANY	SHREE MOHINI COMPLEX 345, KINGSWAY,NAGPUR
NAME OF BANK	STATE BANK OF INDIA
NAME OF BANK BRANCH AND BRANCH CODE	SBI,KINGSWAYBRANCH,BRANCH CODE-00432
CITY	NAGPUR
ACCOUNT NUMBER	31380025872
ACCOUNT TYPE	CURRENT A/C
IFSC CODE OF THE BANK BRANCH	SBIN0000432
MICR CODE OF THE BANK BRANCH	440002002

Above bank account, details can be used for remittance of Security Deposit as well by the successful tenderer.

# BHEL PSWR Notice Inviting Tender

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Procedure for Earnest Money Deposit					
Description/ Mode of Submission	EFT	Cash	DD/Pay Order	FDR (Refer GCC clause no 1.9.1(iv) for FDR)	Bank Guarantee (Refer GCC clause no 1.9.1(iv) for Acceptable Portion of EMD in the Form of BG)
Proof of EMD along with the offer			Scan Copy has to be uploaded	Scan Copy has to be uploaded	Scan Copy of BG has to be uploaded.
Submission of EMD to BHEL PSWR, Nagpur	Receipt of Amount Transferred into BHEL Account	Recei pt of cash depos it at BHEL office	Original DD/ Pay order to be sent through Registered Post	The Original FDR to be sent through Courier/Post to BHEL PSWR Nagpur.	The Original Bank Guarantee/any extensions /amendments shall be sent directly by the Bank to BHEL under Registered Post (Acknowledgement Due), addressed to the Purchase Department, BHEL PSWR, Nagpur.

~~Copy of One Time EMD Certificate or~~ The proof of Demand Draft/ Payorder/FDR or BG or receipt of Electronic Fund Transfer duly **digitally** signed is to be uploaded with the Techno Commercial offer on '**e-tender portal**' → <https://bhel.abcprocure.com>. In case of Demand Draft/ Payorder/FDR/BG, Original Demand Draft/ Payorder/FDR/BG 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:

Procedure for Submission of Tender is available in the "[Bidder Manual for BHEL Bidders](https://bhel.abcprocure.com)" at E-tender portal <https://bhel.abcprocure.com>. Terms and conditions mentioned therein shall form integral part of the NIT and bidders shall abide by the same.

### a) Hardware and Software requirements for participating in e-tender:

- ❖ Please refer the website for the minimum system requirements and setting document for Bidders under the link: <https://bhel.abcprocure.com>

### b) Digital Signature

- ❖ To know the procedure for obtaining Digital Signature Certificate (DSC), suppliers who are not having the DSC are advised to visit our website [www.bhel.com](http://www.bhel.com) → Tender Notifications → Sample Checklist.

### c) M/s E-Procurement Technologies Limited Helpdesk Contacts:

During normal business hours, helpline maintained by the service provider e-Procurement Technologies Limited is available for clarifying any doubts of supplier/s. The helpline numbers are provided in the e-procurement website.

- ❖ Mr. Swapnil Hamilton, Support Executive, Ph: +91 7940270549, e-mail ID: [swapnil.h@eptl.in](mailto:swapnil.h@eptl.in)
- ❖ Mr. Hardik Oza, Support Executive, Ph: +91 7940270560, e-mail ID: [hardik.oza@eptl.in](mailto:hardik.oza@eptl.in)
- ❖ Mr. Ankur Bhatt, Support Executive, Ph: +91 7940270590, e-mail ID: [ankur.bhatt@eptl.in](mailto:ankur.bhatt@eptl.in)
- ❖ Mr. Prashant, Asst. Manager – Implementation & Support, Ph: +91 7940270545, e-mail ID: [prashant@eptl.in](mailto:prashant@eptl.in)

## Note

Registered Office: BHEL House, Siri Fort, New Delhi – 110 049, India  
Website: [www.bhel.com](http://www.bhel.com)



**BHEL PSWR**  
**Notice Inviting Tender**

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- i. Offers/tenders submitted in the E-tender portal shall only be considered for further evaluation. Offers sent by FAX / E-mail / any mode other than E-tender would not be entertained.**

The Tenderers must submit their Tenders, as detailed below:

- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)'
- PART-II (Price Bid)

The contents of the offer/tender are as given below. **(All Documents to be digitally signed and uploaded in E-tender Portal)**

SN	Description	Remarks
	<b>Part-I A</b>	
i.	Covering letter/Offer forwarding letter of Tenderer (in the techno commercial compliance sheet provided)	
ii.	Duly filled-in 'No Deviation Certificate' as per prescribed format. <b>Note:</b> <ol style="list-style-type: none"> <li>a. In case of any deviation, the same should be submitted separately, indicating respective clauses of tender against which deviation is taken by bidder. It shall be specifically noted that deviation recorded elsewhere shall not be entertained.</li> <li>b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding. <ol style="list-style-type: none"> <li>i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL</li> <li>ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender</li> </ol> </li> </ol>	
iii.	Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria. It shall be specifically noted that a credential certificates issued by clients shall distinctly bear the name of organization, contact phone no, FAX no, etc.	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc. pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc. as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume - IE: Technical Specification and Plot Plan	
xiii.	<del>Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item</del>	
xiv.	Any other details preferred by bidder with proper indexing.	

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	<b>PART-I B</b>	
i.	1. Earnest Money Deposit (EMD) in the form as indicated in this Tender <b>OR</b> <del>Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender</del>  2. <del>Cost of Tender ( Demand Draft or copy of Cash Receipt as the case may be)</del>  Note: Refer Clause No-3 and 4 of NIT for further details	
	<b>PART-II</b>	
ii	Volume II – PRICE BID ( Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

- SPECIAL NOTE: All documents/ annexures to be submitted should be uploaded in respective places in the E-Tender portal as per the list mentioned given in this NIT. BHEL shall not be responsible for in-complete documents.**

- 6.0 Void
- 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 3<sup>rd</sup> 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 3<sup>rd</sup> Month preceding the month corresponding to 'latest date of bid submission', in the following manner:

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(**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)  $P_1, P_2, P_3, P_4, P_5, \dots, P_N$  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 =  $P_T$  (i.e.  $P_T = P_1 + P_2 + P_3 + P_4 + \dots + P_N$ )
- 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  $P_2, T_3$  for package  $P_3$ , etc. for the tendered scope. Now calculate cumulative total months ' $T_T$ ' for total similar Packages ' $P_T$ ' for all Regions (i.e.  $T_T = T_1 + T_2 + T_3 + T_4 + \dots + T_N$ )
- c) Sum ' $S_1$ ' of 'Monthly Performance Evaluation' Scores ( $S_{1-1}, S_{1-2}, S_{1-3}, S_{1-4}, S_{1-5} \dots S_{1-T_1}$ ) for similar package  $P_1$ , for the 'period of assessment' ' $T_1$ ' (i.e.  $S_1 = S_{1-1} + S_{1-2} + S_{1-3} + S_{1-4} + S_{1-5} + \dots + S_{1-T_1}$ ). 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 ' $P_T$ ' for all Regions (i.e. ' $S_T = S_1 + S_2 + S_3 + S_4 + S_5 + \dots + S_N$ ')
- d) **Overall Performance Rating ' $R_{BHEL}$ ' for the Similar Package/Packages** (under execution/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL

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

- 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

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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 <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>	...	P <sub>N</sub>	Total No. of similar packages for all Regions = P <sub>T</sub> 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 <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	...	T <sub>N</sub>	Sum (Σ) of columns (iii) to (ix)  = T <sub>T</sub>
3	Monthly performance scores for the corresponding period (as in Row 2)	S <sub>1-1</sub> , S <sub>1-2</sub> , S <sub>1-3</sub> , S <sub>1-4</sub> , ... S <sub>1-T1</sub>	S <sub>2-1</sub> , S <sub>2-2</sub> , S <sub>2-3</sub> , S <sub>2-4</sub> , ... S <sub>2-T2</sub>	S <sub>3-1</sub> , S <sub>3-2</sub> , S <sub>3-3</sub> , S <sub>3-4</sub> , ... S <sub>3-T3</sub>	S <sub>4-1</sub> , S <sub>4-2</sub> , S <sub>4-3</sub> , S <sub>4-4</sub> , ... S <sub>4-T4</sub>	S <sub>5-1</sub> , S <sub>5-2</sub> , S <sub>5-3</sub> , S <sub>5-4</sub> , ... S <sub>5-T5</sub>	.. ... ... ... ... ...	S <sub>N-1</sub> , S <sub>N-2</sub> , S <sub>N-3</sub> , S <sub>N-4</sub> , ... S <sub>N-TN</sub>	-----
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	...	S <sub>N</sub>	Sum (Σ) of columns (iii) to (ix) = S <sub>T</sub>

- ii). Calculation of Overall 'Performance Rating' (R<sub>BHEL</sub>) 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<sub>BHEL</sub>' shall be calculated subject to availability of 'performance scores' for at least 6 'package months' in the order of precedence below:

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

In case, R<sub>BHEL</sub> 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<sub>BHEL</sub>) at Power Sector Regions:

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

**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  $R_{BHEL} \geq 80$ , 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)

**Note:** For the transition period of 1 year (i.e. for all the NITs floated between 11<sup>th</sup> May 2019 to 10<sup>th</sup> May 2020), in addition to above, 'Assessment of Capacity of Bidder' shall also be calculated considering 'performance scores' till 36 months as per Sl. no II ii).

Higher of the results obtained out of both shall be considered for 'Assessment of Capacity of Bidder'.

**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 ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection	i). Electrical ii). C&I iii). Others (Elect. and C&I)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). ESP

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v). Chimney vi). Cooling Tower vii). Others (Civil)		iv). LP Piping v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Management x). Others (Mechanical)
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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 four, 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 ( $R_{BHEL}$ )  $\geq 60$  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 four, then in addition to bidders considered as per option “a”, “First timer” bidders having average of available performance scores  $\geq 60$  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 four, 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’.

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**Note:-** In case, the number of bidders qualified against Technical and Financial Qualification criteria itself is less than four, then all bidders (a)- having Overall Performance Rating ('R<sub>BHEL</sub>') ≥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 25<sup>th</sup> of Evaluation Month or 3 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 in CL 9 above 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 or **through E-tender 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

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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 **Digitally** 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 point (1) 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 reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .
- However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDS' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.
- 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. For the tenders requiring services of Original supplier of equipment/services, offer is preferred from the OEM/Principal. However, if the OEM/Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one



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manufacturer/supplier in the same tender. Moreover, either the agent could bid on behalf of manufacturer / supplier or manufacturer / supplier could bid directly but not both. In case bids are received from both manufacturer / supplier and the agent, bid from agent shall be ignored.

- 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 with a validity period of six months initially. In case the consortium is awarded the contract, then the Consortium Agreement between the Prime Bidder and Consortium Partner or partners shall be extended till contractual completion period including extension periods if any applicable.
- 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) shall be as specified in the PQR.
- 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. 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 the prime Bidder withdraws, the whole contract shall be considered cancelled and short closed.

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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 two similar works with the same consortium partner or partners under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for similar works, subject to certification from BHEL about the active involvement of the Prime Bidder for satisfactory execution of the works.~~

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. The 100% SD value to be submitted by the consortium partner/(s) shall be remitted before start of work. All the terms & conditions of the SD clause in Vol-IC GCC shall be applicable for this SD except clauses no 1.10.1, 1.10.4 & 1.10.6 of Vol-IC GCC. For **"modes of deposit"** of this SD, clause no 1.10.3 of Vol-IC GCC shall be applicable.

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/upload documents in support of possession of 'Qualifying Requirements' duly self-certified and stamped by the authorized signatory (**through Digital Signature**), as per 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 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-Volume-II
- 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/rules in respect of suspension of business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', etc may undergo change from time to time and the latest one shall be followed.

For BHARAT HEAVY ELECTRICALS LTD

(Addl. General Manager - Purchase)

**Enclosure**

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List.
03. Annexure-3: Integrity Pact
04. Annexure-4: Important Information.
05. ~~Annexure-5: MSE Annex.~~
06. Annexure-6: Declaration for Reverse Auction.
07. Annexure-7: Declaration for not being under Bankruptcy Code Proceedings.

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**ANNEXURE - 1**

**PRE QUALIFYING CRITERIA**

<b>E-Tender Spec No: BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282/PKG-B/2283</b>	
<b>JOB</b>	<p><b><u>PACKAGE-A:</u></b> Civil and Architectural works of Main plant FGD Civil Works of Unit # 1, 2 &amp; 3 (3X200 MW) including Civil Works of Fire Protection System, Misc. Tanks, Misc. Pump House &amp; Sump, Pipe/ Cable Rack, duct supports, Road, Drains, Water Supply, Sanitation etc. Civil and Architectural Works of common facilities /structures e.g., Lime Handling System, Gypsum Handling System, Misc. Tanks, Misc. Pump House &amp; Sump etc. Construction of (1 no of 240M Height for Unit # 1, 2 &amp; 3 and 1 no of 150M height for Unit#5 ) RCC Single Flue Chimney complete in all respect including RCC Works, Fabrication &amp; Erection of Steel Flue Cans, Installation of Borosilicate Glass Block Lining on inner surface of Steel Flue Can, Supply, Fabrication and Erection of Mini Shell of Titanium as per specification, Erection of Shop Fabricated Structural Platforms, Supply &amp; Installation of Electrical Items in conformity with the approved Layout etc to complete the Chimney in all respect. at <b>NTPC Ramagundam TPS Stage-I &amp; II (3x200MW + 3x500MW) FGD Package.</b></p> <p style="text-align: center;"><b>and</b></p> <p><b><u>PACKAGE-B:</u></b> Civil and Architectural Works of Main Plant FGD Civil Works of Unit#4 (1X500MW), Unit#5 (1X500MW) &amp; Unit#6 (1X500MW) including Civil Works of Fire Protection System, Misc. Tanks, Misc. Pump House &amp; Sump, Pipe/ Cable Rack, Duct Supports, Road, Drains, Water Supply, Sanitation etc. Civil and Architectural Works of common facilities /Structures e.g. FGD Control Room, ACW Pump House, Road, Drains, Water Supply, Sanitation etc. Construction of (1 no of 150M height for Unit#4 &amp; 1 no of 150M height for Unit#6) RCC Single Flue Chimney complete in all respect including RCC Works, Fabrication &amp; Erection of Steel Flue Cans, Installation of Borosilicate Glass Block Lining on Inner surface of Steel Flue Can, Supply, Fabrication and Erection of Mini Shell of Titanium as per Specification, Erection of Shop Fabricated Structural Platforms, Supply &amp; Installation of Electrical Items in conformity with the approved layout etc to complete the Chimney in all respect. at <b>NTPC Ramagundam TPS Stage-I &amp; II (3x200MW + 3x500MW) FGD Package.</b></p>

S No	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Applicability	
A	<p>Submission of Integrity Pact duly signed (if applicable)</p> <p>(Note: To be submitted by Prime Bidder &amp; Consortium /Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)</p>	APPLICABLE	
B	<p><b><u>TECHNICAL PQR:</u></b></p> <p>Bidder shall essentially meet all the Qualifying Requirements (i.e. B.1, B.2, B.3, B.4 and B.5) as under, in the last seven years as on latest date of bid submission:</p> <p><b><u>B.1: Bidder should have Executed “Piling or Civil or Structure or ‘Civil and Structural works’ or RCC Chimney or RCC Cooling Tower or RCC Silo or Mill Bunker or any combination of these works” for any one of the following in the last seven years from latest date of bid submission:</u></b></p> <p style="padding-left: 40px;"><b>B.1.1)</b> Executed One work of value not less than <b>Rs. 4960.00 Lakhs</b> against single work order.</p> <p style="text-align: center;"><b>OR</b></p> <p style="padding-left: 40px;"><b>B.1.2)</b> Executed Two works each of value not less than <b>Rs. 3100.00 Lakhs</b> against maximum two work orders.</p>	APPLICABLE	

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S No	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Applicability	
	<p style="text-align: center;"><b>OR</b></p> <p><b>B.1.3)</b> Executed Three works each of value not less than <b>Rs. 2480.00 Lakhs</b> against maximum three work orders.</p> <p style="text-align: center;"><b>AND</b></p> <p><b>B.2:</b> Bidder should have executed Reinforced Cement Concrete (RCC) quantities of atleast <b>21,860 Cum</b> within a period of twelve consecutive months against one running/ completed contact.</p> <p style="text-align: center;"><b>AND</b></p> <p><b>B.3:</b> Bidder should have executed atleast <b>890.00 Cum</b> of cutting in hard rock within a period of twelve consecutive months against one running/ completed contact.</p> <p style="text-align: center;"><b>AND</b></p> <p><b>B.4:</b> Bidder should have executed atleast <b>31,050 Cum</b> of Earthwork in filling involving mechanical compaction within a period of twelve consecutive months against one running/ completed contact.</p> <p style="text-align: center;"><b>AND</b></p> <p><b>B.5:</b> Bidder should have built atleast one <b>“RCC Chimney”</b> of minimum <b>100 Mtr height</b> against one Contract.</p> <p><b>Note-01:</b> Bidder should satisfy PQR B.1, B.2, B.3, B.4 and B.5 as a <u>standalone bidder</u>. In case a bidder does not satisfy <b>PQR-B.5</b> above, then the bidder can form consortium with one party who satisfies the PQR B.5 above. This will be termed as <b>“Consortium Bidding”</b>. In case of consortium bidding, following shall be applicable:</p> <ul style="list-style-type: none"> <li>• Prime bidder should satisfy PQR B.1, B.2, B.3 &amp; B.4 above.</li> <li>• Agency satisfying PQR B.5 shall be termed as <b>“Consortium Partner”</b>.</li> <li>• Prime bidder shall be responsible for satisfying the financial PQR-C (i.e. C-1, C-2, C-3 &amp; C.4).</li> <li>• Prime bidder shall submit the entire tender along with the credentials, all statutory documents and the documents in support of PQR condition of the Consortium Partner.</li> </ul> <p><b>Note-02:</b> All conditions as in Clause 23 of NIT shall also be applicable for consortium bidding.</p> <p><b>Note-03:</b> For PQ Criteria B.5, the “Built RCC Chimney” shall mean that chimney should be completed.</p>		

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S No	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Applicability	
<b>C-1</b>	<b><u>Financial TURNOVER</u></b> Bidders must have achieved an average annual financial turnover (audited) of <b>Rs. 1860.00 Lakhs</b> or more over last three Financial Years (FY) i.e. 2016-17, 2017-18 & 2018-19.	<b>APPLICABLE</b>	
<b>C-2</b>	<b><u>NETWORTH</u></b> (only in case of Companies) Net worth of the Bidder based on the latest Audited Accounts as furnished for 'C-1' above should be positive.	<b>APPLICABLE</b>	
<b>C-3</b>	<b><u>PROFIT</u></b> Bidder must have earned profit in any one of the three Financial Years as applicable in the last three Financial Years as furnished for 'C-1' above.	<b>APPLICABLE</b>	
<b>C-4</b>	Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect. <b>(Refer Annexure-7 of NIT for format).</b>	<b>APPLICABLE</b>	
<b>D</b>	<b>Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)</b> The "Assessment of Capacity of Bidders" for this Tender shall be carried out by considering the identified similar package.	<b>APPLICABLE</b>	<b>BY BHEL</b>
<b>E</b>	<b>Approval of Customer (if applicable)</b> <b>Note:</b> 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	<b>APPLICABLE</b>	<b>BY BHEL</b>
<b>F</b>	Price Bid Opening <b>Note:</b> Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E		<b>BY BHEL</b>
<b>G</b>	Consortium tie-ups	<b>APPLICABLE</b>	

**Explanatory Notes for the PQR (unless otherwise specified in the PQR):**

**Explanatory Notes for PQR B.1 (Technical)**

- For the criteria (B.1), actual executed value shall be considered.
- 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-

$$P = R + \left\{ \frac{0.425 \times R \times (X_N - X_0)}{X_0} \right\} + \left\{ \frac{0.425 \times R \times (Y_N - Y_0)}{Y_0} \right\}$$

Where

P = Updated value of work

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S No	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Applicability	
	<p>R = Value of executed work</p> <p>X<sub>N</sub> = 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'16 shall be considered).</p> <p>X<sub>0</sub> = All India Avg. Consumer Price index for industrial workers for last month of work execution.</p> <p>Y<sub>N</sub> = Monthly Whole Sale Price Index for All Commodities for the month, 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'16 shall be considered).</p> <p>Y<sub>0</sub> = Monthly Whole Sale Price Index for All Commodities for last month of work execution.</p> <p><b><u>Explanatory Notes for PQR B.2, B.3, B.4 &amp; B.5 (Technical):</u></b></p> <p>3. Unless otherwise specified, for the purpose of "B.2, B.3 &amp; B.4 Technical Criteria", the word 'EXECUTED' means achievement of milestones as defined below –</p> <p>a) "ACHIEVEMENT OF PHYSICAL QUANTITIES" as per PQRs.</p> <p>b) <del>"READINESS FOR COAL FILLING" in respect of Mill Bunker.</del></p> <p>c) <del>"CHARGING" in respect of Power Transformers / Bus Ducts / "HT/LT Switchgears" / "HT / LT Gabling".</del></p> <p>d) <del>For C&amp;I works: "SYNCHRONISATION" in case of power project and "WORK COMPLETION of the value as defined in PQR" in case of industry.</del></p> <p>e) <del>"BOILER LIGHT UP" in respect of Boiler / CFBC / ESP.</del></p> <p>f) <del>"GAS IN" in respect of HRSG.</del></p> <p>g) <del>"STEAM BLOWING COMPLETION" in respect of Power Cycle Piping.</del></p> <p>h) <del>"HYDRAULIC TEST" of the system in respect of Pressure parts / LP Piping / CW Piping.</del></p> <p>i) <del>"FULL LOAD OPERATION OF THE UNIT" in respect of Insulation work.</del></p> <p>j) <del>"SYNCHRONISATION" in respect of STG / GTG.</del></p> <p>k) <del>"SPINNING" in respect of HTG.</del></p> <p>l) <del>"COMPLETION AND HANDING OVER FOR MECHANICAL ERECTION" in respect of STG Deck and Machine/Equipment foundation.</del></p> <p>4. Boiler means HRSG or WHRB or any other types of Steam Generator.</p> <p>5. Power Cycle piping means Main Steam, Hot Reheat, Cold Reheat, HP Bypass.</p> <p>6. 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. Similarly, wherever rating of Gas Turbine is mentioned in terms of Frame size, ISO rating of the same in terms of MW shall be considered for evaluation.</p> <p>7. Scope for Capital overhaul of STG shall cover Bearing Inspection work and overhauling of all cylinders of the Turbine.</p> <p>8. In case the tendered scope is not a Pulverized Fuel Boiler, experience of Oil/Gas Fired Boilers can also be considered.</p> <p>9. In case of lower rated units in Cogen, Combined Cycle of Industrial projects (especially Refinery projects), the packaging philosophy should be a composite package consisting of GTGs/STGs/Boilers etc. for tendering purpose with a PQR of a 500 MW Boiler with consortium provision for STG.</p> <p><b><u>Explanatory Notes for PQR -C (Financial):</u></b></p> <p>10. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above.</p>		

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S No	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Applicability	
11.	In case audited financial statements have not been submitted for all the three years as indicated against C-1 above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years.		
12.	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.		
13.	C-2: -NETWORTH: Shall be calculated based on the latest Audited Accounts as furnished for C-1 above. Net worth = Paid up share capital* + Reserves. (*: Share Capital OR Partnership Capital OR Proprietor Capital as the case may be)		
14.	C-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 'C-1' above. <b>Note:</b> PROFIT shall be PBT earned during any one year of last three financial years as in 'C-1' above.		
<b><u>Common Explanatory Notes:</u></b>			
1.	For evaluation of PQR, the credentials of the Bidder alone, and not that of the Group Company shall be considered.		
2.	Completion date for achievement of the technical criteria specified in the Common QR should be in the last 7 years ending on the ' <b>latest date of Bid Submission</b> ' of Tender irrespective of date of the start of work.		
3.	<b>"Executed"</b> means the bidder should have achieved the criteria specified in the Common QR even if the Contract has not been completed or closed.		
4.	In case the Experience/PO/WO certificate enclosed by bidders do not have separate break up of prices for the E&C portion for Electrical and C&I works (i.e. the certificates enclosed are for composite order for supply and erection of Electrical and C&I and other works if any), then value of Erection & Commissioning for the Electrical and C&I portion shall be considered as 15% of the price for supply & erection of Electrical and C&I.		
5.	Following shall be complied with in case of <b>consortium</b> :		
a.	The Prime Bidder and Consortium Partner(s) are required to enter in to a consortium agreement with a validity period of " <b>six months</b> " initially. Thereafter, the Prime Bidder and Consortium Partner(s) shall certify to BHEL regarding existence and validity of their consortium agreement on <b>six monthly</b> basis.		
b.	Prime Bidder and Consortium partners shall be approved by Customer for being considered for the tender (applicable if customer approval is required).		
c.	Number of partners including prime Bidder shall be NOT more than <b>2 (Two)</b> .		
d.	Prime Bidder alone shall necessarily comply with " <b>B1 Technical Criteria</b> " except for mechanical package where B1 criteria is not applicable.		
e.	Prime Bidder and Consortium Partner shall together comply with the ' <b>Pre-Qualification Requirements</b> ' specified for the respective category of technical requirement as per "technical criteria".		
f.	Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified.		
g.	All other conditions shall be read in conjunction with clause no 23.0 of NIT.		
h.	Prime Bidder shall be the Bidder who has a major share of work.		
i.	Prime Bidder shall be responsible for the overall execution of the Contract.		
j.	Performance shall be evaluated for Prime Bidder and the Consortium partner for their respective scope of work.		

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S No	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Applicability	
k.	In case the Consortium partner backs out, another consortium partner meeting the QRs, has to be engaged by Prime Bidder and if not, the respective work will be withdrawn and executed on risk and cost basis of the prime bidder.		
l.	In case Prime Bidder withdraws, the whole contract shall be considered cancelled and short closed.		
m.	After successful execution of one work with a consortium partner under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a ' <u>standalone</u> ' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders.		
n.	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.		

**BIDDER SHALL SUBMIT CREDENTIALS (DETAILED WORK ORDER, BOQ, ONGOING/COMPLETION CERTIFICATE, **TDS CERTIFICATES** AND FINANCIAL DOCUMENTS ETC) BASED ON WHICH BIDDER IS CLAIMING TO SATISFY THE PQ CRITERIAS.**

**Note:**

**1. 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 its internal guidelines.**

**2. Void**



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<b>Bidder's Response against BHEL TECHNICAL PQR (WHICHEVER IS APPLICABLE)</b>				
<b>PQR No</b>	<b>Pre-Qualifying Requirement</b>	<b>Ref of Detailed Work Order, Name of the Work based on which bidder is claiming PQR</b>	<b>Ref of Completion Certificate and <b>TDS Certificates</b> based on which bidder is claiming PQR</b>	<b>Remarks, if Any</b>
<b>B</b>	Bidder shall essentially meet all the Qualifying Requirements ( <b>i.e. B.1, B.2, B.3, B.4 and B.5</b> ) as under, in the last seven years as on latest date of bid submission:			
<b>B.1</b>	<p>Bidder should have Executed <b><u>"Piling or Civil or Structure or 'Civil and Structural works' or RCC Chimney or RCC Cooling Tower or RCC Silo or Mill Bunker or any combination of these works"</u></b> for any one of the following in the last seven years from latest date of bid submission:</p> <p><b>B.1.1)</b> Executed One work of value not less than <b>Rs. 4960.00 Lakhs</b> against single work order.</p> <p style="text-align: center;"><b>OR</b></p> <p><b>B.1.2)</b> Executed Two works each of value not less than <b>Rs. 3100.00 Lakhs</b> against maximum two work orders.</p> <p style="text-align: center;"><b>OR</b></p> <p><b>B.1.3)</b> Executed Three works each of value not less than <b>Rs. 2480.00 Lakhs</b> against maximum three work orders.</p>			
<b>B.2</b>	Bidder should have executed Reinforced Cement Concrete (RCC) quantities of atleast <b>21,860 Cum</b> within a period of twelve consecutive months against one running/ completed contact.			
<b>B.3</b>	Bidder should have executed atleast <b>890.00 Cum</b> of cutting in hard rock within a period of twelve consecutive months against one running/ completed contact.			

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<b>Bidder's Response against BHEL TECHNICAL PQR (WHICHEVER IS APPLICABLE)</b>				
<b>PQR No</b>	<b>Pre-Qualifying Requirement</b>	<b>Ref of Detailed Work Order, Name of the Work based on which bidder is claiming PQR</b>	<b>Ref of Completion Certificate and <b>TDS Certificates</b> based on which bidder is claiming PQR</b>	<b>Remarks, if Any</b>
<b>B.4</b>	Bidder should have executed atleast <b>31,050 Cum</b> of Earthwork in filling involving mechanical compaction within a period of twelve consecutive months against one running/ completed contract.			
<b>B.5</b>	Bidder should have built atleast one <b>"RCC Chimney"</b> of minimum <b>100 Mtr height</b> against one Contract.			
<b>NOTE:</b> <ol style="list-style-type: none"> <li>1. BIDDERS MUST CLEARLY INDICATE IN THE TABLE ABOVE, HOW THEY ARE SATISFYING TECHNICAL PQR ALONG WITH THE REFERENCE OF THE SUPPORTING DOCUMENTS.</li> <li>2. BHEL WILL NOT CONSIDER ANY OTHER DOCUMENT OTHER THAN THOSE SPECIFIED BY THE BIDDERS IN THE TABLE ABOVE FOR EVALUATION OF TECHNICAL PQR. BIDDER MAY ATTACH SEPERATE SHEET IF NECESSARY.</li> </ol>				

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**ANNEXURE - 2**

**CHECK LIST**

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

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No:                      Date : Bank :                      Amount: Please tick ( ✓ ) whichever applicable:- <del>ONE TIME EMD</del> / ONLY FOR THIS TENDER	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with <b>PRE QUALIFICATION CRITERIA</b> (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable/ <del>Not Applicable</del>	YES / NO
7	Audited profit and Loss Account for the last three years	Applicable/ <del>Not Applicable</del>	YES/NO
8	Copy of PAN Card	Applicable/ <del>Not Applicable</del>	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc. are read understood and signed	Applicable/ <del>Not Applicable</del>	YES/NO
10	Integrity Pact	Applicable/ <del>Not Applicable</del>	YES/NO
11	Declaration by Authorized Signatory	Applicable/ <del>Not Applicable</del>	YES/NO
12	No Deviation Certificate	Applicable/ <del>Not Applicable</del>	YES/NO
13	Declaration for Reverse Auction by Bidder	Applicable/ <del>Not Applicable</del>	YES/NO

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14	Declaration confirming knowledge about Site Conditions	Applicable/ <del>Not Applicable</del>	YES/NO
15	Declaration for relation in BHEL	Applicable/ <del>Not Applicable</del>	YES/NO
16	Non-Disclosure Certificate	Applicable/ <del>Not Applicable</del>	YES/NO
17	Bank Account Details for E-Payment	Applicable/ <del>Not Applicable</del>	YES/NO
18	Capacity Evaluation of Bidder for current Tender	Applicable/ <del>Not Applicable</del>	YES/NO
19	Tie Ups/Consortium Agreement are submitted as per format	Applicable/ <del>Not Applicable</del>	YES/ NO
20	Power of Attorney for Submission of Tender/Signing Contract Agreement Power of Attorney of Consortium Partner.	Applicable/ <del>Not Applicable</del>	YES/NO
21	Analysis of Unit rates	Applicable/ <del>Not Applicable</del>	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 :**

**AUTHORISED SIGNATORY**  
**(With Name, Designation and Company seal)**

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**ANNEXURE-3**

**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 of 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.

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**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)/ Contractors(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 Bidders (s)/ Contractor(s) shall disclose the name and address of agents and representative in India and India Bidder(s)/Contractor(s) to disclose their foreign principals or associates. The Bidders (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.

**Section 3 – Disqualification from tender process and execution 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 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 to 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.

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**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 his 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/ Sub-contractors**

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Sub-contractor, 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)/ Contractors(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)/ Sib-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 meeting 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.

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- 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 organization.
- 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 bidder 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 reminder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

<p>Registered Office: BHEL House, Siri Fort, New Delhi – 110 049, India Website: <a href="http://www.bhel.com">www.bhel.com</a></p>
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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) \_\_\_\_\_  
\_\_\_\_\_

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**ANNEXURE-4**

**IMPORTANT INFORMATION**

**E -Tender** for this work is invited by BHEL PSWR NAGPUR and offer shall be submitted through BHEL e-procurement portal only. All correspondences regarding this tender shall be through E-procurement portal.

**Postal Address:**

AGM /Purchase BHEL PSWR,  
SRIMOHINI COMPLEX, 345 KINGSWAY, NAGPUR 440001, INDIA

Following are the concerned BHEL officials to whom bidders can contact in case of any difficulty:

AGM Purchase, Email: [prchiwarkar@bhel.in](mailto:prchiwarkar@bhel.in). Ph: +91 – 712 – 3048 - 633

Dy Manager Purchase, Email: [nktiwari@bhel.in](mailto:nktiwari@bhel.in), Ph: +91 – 712 – 3048 – 713

Sr Engineer Purchase, Email: [svm@bhel.in](mailto:svm@bhel.in), Ph: +91 – 712 – 3048 – 715

Asst. Engineer Purchase, Email: [bajjnath@bhel.in](mailto:bajjnath@bhel.in) , Ph: +91 – 712 – 3048 - 652

- 1. The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site ([www.bhel.com](http://www.bhel.com) → Tender Notification → List of Banned Firms )**
- 2. Refer Chapter XII of Volume IB Special Conditions of Contract regarding Suspension of Business Dealings: The abridged version of extant ‘Guidelines for suspension of business dealings with suppliers/ contractors’ has now been uploaded on [www.bhel.com](http://www.bhel.com) on “supplier registration page” at the following link: [http://www.bhel.com/vender\\_registration/pdf/Suspension\\_guidelines\\_adbridged.pdf](http://www.bhel.com/vender_registration/pdf/Suspension_guidelines_adbridged.pdf)**
- 3. The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site [www.bhel.com](http://www.bhel.com).**

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

3.1. 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.

3.2. Commitment by Bidder/ Supplier/ Contractor:

3.2.1. 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.

3.2.2. 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

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

3.2.3. 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 price 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 extant guidelines of the company available on [www.bhel.com](http://www.bhel.com) and/or under applicable legal provisions”.

4. **“Pradhan Mantri Kaushal Vikas Yojna:** 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”.
5. **All Statutory Requirements as applicable for this project shall be complied with.**
6. **BHEL Fraud Prevention Policy:** “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.”
7. **Following clause shall form part of the HSE documents issued under Chapter IX of Volume IB ‘Special Conditions of Contract’**  
  
“In case of any financial deduction made by Customer for lapses of safety other than what is provided elsewhere in the contract, the same shall be charged on back-to-back basis on the defaulting contractor without prejudice to any other right spelt anywhere in the tender /contract”
8. **Please take note of following Revised Tender Clauses:**
  - Notice Inviting Tender: Sl No 4 and corresponding Changes in GCC Clause No 1.9 regarding EMD
  - General conditions of Contract: Clause 1.10, 2.13, 1.15.11, Clause No. 2.7.2, Clause No. 2.7.3, Clause No 2.7.10 (New), Clause No 2.28.5 (New), Clause No 2.21.

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**9. Following Notes are added to Form F- 15 of Volume I D 'Forms & procedures'**

- i. It is only indicative and shall be as per the online format issued by BHEL time to time.
- ii. No request will be entertained after specified date of the current month w.r.t the changes requested in the scores of immediate previous month.

**10. OVER RUN COMPENSATION**

Over Run Compensation Clause no. 2.12 of Vol I C GCC **shall not be Applicable** for this contract.

**11. Start of Period for "Performance Guarantee for Workmanship" as per clause no 2.24 of Vol-IC GCC:**

This period shall commence after the completion of Contract Period as certified by Engineer-in-Charge.

**12. Delay in 1st submission of SDBG/ PBBG:** SDBG/ PBG is to be furnished by the vendor before start of work. No payment will be released till SDBG/PBG is submitted by the vendor.

However if requested by the vendor, cash recovery equivalent to SDBG/ PBG value to be made from the running bills submitted by the vendor. In such case, recovery of interest calculated @SBI PLR +2% on amount equivalent to SDBG/ PBG value to be made for the gap period (difference between date of start of work and date of submission of BG/ cash recovery).

**13. Compensation in case of Death/ Permanent Incapacitation of Person:** BHEL shall recover the amount of compensation paid to victim (s) by BHEL towards loss of life/ permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employee as detailed below:

- a) Victim: Any person who suffers permanent disablement of dies in an accident as defined below.
- b) Accident: Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/ operation and works incidental thereto at BHEL factories/ offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, serving, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works/ during working at BHEL Units/ Offices/ townships and premises/ Project sites.
- c) Compensation in respect of each of the victims:
  - (i) In the event of death or **permanent disability** resulting from **Loss of both limbs**: Rs 10,00,000/- (**Rs Ten Lakh**)
  - (ii) In the event of **other permanent disability**: Rs 7,00,000/- (**Rs Seven Lakh**)
- d) Permanent Disablement: A disablement that is classified as a permanent total disablement under the proviso to Section 2(I) of the Employee's Compensation Act, 1923.

**14. The clause 2.7.9.1 below is added under the heading "Rights of BHEL" of General Conditions of Contract Volume-IC GCC.**

**2.7.9.1** Provision of Penalty in case of slippage of Intermediate Milestones:

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- .....
- i) Two major Intermediate Milestones are mentioned as M1 & M2 in Chapter VI: Time Schedule of Vol IA Technical Conditions of Contract.
  - ii) In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to Form 14.
  - iii) In case delay in achieving M1 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value\*, limited to maximum 2% of Executable Contract Value, will be withheld.
  - iv) In case delay in achieving M2 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value\*, limited to maximum 3% of Executable Contract Value, will be withheld.
  - v) Amount already withheld, if any against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 Milestone.
  - vi) Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.
  - vii) Final deduction towards LD (if applicable as per clause 2.7.9 above), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of identified intermediate milestone(s) shall be adjusted against LD or released as the case may be.
  - viii) In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery.

\* **Executable Contract Value** - Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.

**15. Amended Quantity Variation Sub Clause no. 2.14.1 of Clause no. 2.14 of Vol-IC GCC:**

“The quantities given in the contract are tentative and may change to any extent (both in plus side and minus side). The quoted rates for individual items shall remain firm irrespective of any variations in the individual quantities. No compensation becomes payable in case the variation of the final executed contract value is within the limit of Minus (-) 30% of awarded contract value.”

**Note:** Sub clause no. 2.14.2 of Clause no. 2.14 shall be applicable as per Vol-IC-GCC.

**16. Acceptance of Bank Guarantee (BG)**

**Revision in Acceptance of Bank Guarantee (BG) Clause no. 1.10.3 (iii) of Vol I C GCC:**

**Clause No. 1.10.3 (iii) of Vol IC GCC is revised as below: -**

“Bank Guarantee issued by:

- a. Any of the BHEL consortium bank listed below:

State Bank of India  
ABN Amro Bank N.V.  
Bank of Baroda  
Canara Bank  
Citi Bank N.A.  
Corporation Bank  
Deutsche Bank

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HDFC Bank Ltd.  
The Hongkong and Shanghai Banking Corporation Ltd  
ICICI Bank Ltd.  
IDBI Ltd.  
Punjab National Bank  
Standard Chartered Bank  
State Bank of Travancore  
State Bank of Hyderabad  
Syndicate Bank

- b. Any public sector Bank (other than consortium banks) with a clause in the text of Bank Guarantee that **"It is enforceable at Nagpur, Maharashtra"**.
- c. Any private sector banks, with a clause in the text of Bank Guarantee that **"It is enforceable by being presented at any branch of the bank"**.

**Note: "Bank Guarantees issued by Co-operative Banks are not acceptable".**

**17. Broad Terms & Conditions of Reverse Auction**

In continuation to Clause 19.0 of NIT (Notice Inviting Tender) following are the broad terms and conditions of Reverse Auction for which Declaration Proforma by bidder has been given in Annexure VI of NIT:

BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on [www.bhel.com](http://www.bhel.com)) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on [www.bhel.com](http://www.bhel.com)).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. **The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.**

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and

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will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on [www.bhel.com](http://www.bhel.com)).

As a reminder to the bidders, system will flash following message (in RED color) during the course of 'online sealed bid':

**"Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL"**

**Note:-** In case the tender is an e-tender and bids are submitted on e-procurement portal of BHEL → <https://bhel.abcpocure.com>, the term 'envelope sealed bid' to be read as "price bid in e-procurement portal".

- 18. MSE Vendors:** MSE bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC.

**Micro & Small Enterprises (MSE) is exempted from Payment of Tender Fees (as in SI No 1 viii of NIT) and Earnest Money deposit (EMD) (as in SI No 1 vii of NIT), if Applicable.**

To avail this benefit, participating MSEs should be registered with District Industries Centers or Khadi and Village Industries Commission or Khadi and Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts and Handloom or Udyog Aadhaar Memorandum or any other body specified by Ministry of Micro Small and Medium Enterprises.

MSE bidders can avail the above benefit only if they submit along with the offer, copies of either Udyog Aadhaar Memorandum or EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with copy of a CA certificate (format enclosed at **Annexure - 5** where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (part 1 in case of two part bid). Non submission of said documents will lead to consideration of their bid at par with other bidders in terms of EMD. No benefit shall be applicable for this enquiry, if any deficiency in the above required documents is not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal.

**19. PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA) CLAUSE:**

"For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/ PO/ WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable."

**20. Integrity Pact:**

- (a) IP is a tool to ensure that activities and transactions between the company and its Bidder/Contractors are handled in a fair, transparent and corruption free manner.



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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	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 bidding. In other words, entering into this pact would be a preliminary qualification.
- (c) Please refer section-8 of the 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 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 provided below:

**Details of contact person (s):**

**Name:** (1) P R Chiwarkar/ AGM (Purchase) (2) Neeraj Tiwari/ Dy Manager (Purchase)  
**Dept.:** Purchase Department  
**Address:** Shreemohini Complex, 345 Kingsway, Nagpur-440001  
**Phone:** (LL/ Mobile) (1) 0712-3048633 (2)0712-3048713  
**Email:** [prchiwarkar@bhel.in](mailto:prchiwarkar@bhel.in) (2) [nktiwari@bhel.in](mailto:nktiwari@bhel.in)  
**Fax:** 0712-3048699

**21. Modality of Tendering and Award:**

- i) This is a combined tender of two Packages (i.e. Package-A and Package-B) for FGD Civil Works at **NTPC Ramagundam TPS Stage-I&II (3x200MW + 3x500MW) FGD Package.**
- ii) The entire scope of work has been divided in two packages (Package-A and Package-B). For both the packages, separate BOQs has been issued (i.e. For Package-A, 'Chapter-XI of Vol-IA-TCC' and for Package-B, 'Chapter-XII of Vol-IA-TCC'). Percentage weightages for individual items has been fixed by BHEL w.r.t. to the total quoted price for 'Package-A only'. For award of 'Package-B', price matching philosophy based on the items rates finalized for Package-A has been envisaged, however, price matching philosophy for award of Package-B shall be at BHEL's discretion.
- iii) All tender documents (other than BOQs) are common for both the Packages i.e. Package-A and Package-B.

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Website: [www.bhel.com](http://www.bhel.com)



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**E-Tender Spec No: BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282/PKG-B/2283 Page 41 of 143**

- .....
- iv) Bidder has to submit their Price for Package-A only as indicated in the Part-C of Vol-II "Price Bid" at BHEL e-procurement Portal. L-1 Bidder shall be considered for award of Package-A only.
  - v) For award of Package-B, price matching philosophy has been envisaged wherein next bidder in the order of their price competitiveness (i.e. L-2, then L-3 and henceforth) shall be given an option to match/accept the rate for all the individual items of Package-B with that of finalized/awarded rate for individual items of Package-A. **In case, none of the bidders agree to match the awarded rate for Individual Items of Package-A then BHEL at its discretion may opt any other suitable method to finalize the Package-B. However, L-1 bidder will not be considered for award of Package-B.**
  - vi) Each package will be treated as a separate contract.

**22. Format for Consortium Agreement:**

In case of consortium bidding against this tender, bidders are requested to furnish the consortium agreement in the format attached separately namely, "Format for Consortium Agreement-2282-2283."

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**ANNEXURE-5**

**MSE ANNEX**

**Certificate by Chartered Accountant on letter head**

This is to Certify that M/s \_\_\_\_\_, (hereinafter referred to as 'company') having its registered office at \_\_\_\_\_ is registered under MSMED Act 2006, (Entrepreneur Memorandum No \_\_\_\_\_ (Part II) dtd: \_\_\_\_\_,

Category: \_\_\_\_\_ (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year \_\_\_\_\_ as per MSMED Act 2006 is as follows:

**1. For Manufacturing Enterprises:** Investment in plant and machinery (Le. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006:

Rs \_\_\_\_\_ Lakhs

**2. For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:

Rs \_\_\_\_\_ Lakhs

The above investment of Rs \_\_\_\_\_ Lakhs is within permissible limit of Rs \_\_\_\_\_ Lakhs for \_\_\_\_\_ Micro / Small (Strike off which is not applicable) Category under MSMED Act 2006.

**OR**

The company has been graduated from its original category (Micro/ Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is..... (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:  
(Signature)

Name –

Membership number –

Seal of Chartered Accountant

Registered Office: BHEL House, Siri Fort, New Delhi – 110 049, India Website: www.bhel.com
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**BHEL PSWR  
Notice Inviting Tender**

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**ANNEXURE-6**

**Declaration for Reverse Auction**

(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,

**Sub: Declaration for Participation in Reverse Auction (RA)**

**Ref: NIT/Tender Specification No: BHE/PW/PUR/ RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282**

We declare that we will participate in Reverse Auction (RA) if BHEL decides for that instead of opening the sealed envelope/ E-Procurement Portal Price Bid, submitted by us. We have read all the guidelines of reverse auction available in tender enquiry as well as on [www.bhel.com](http://www.bhel.com) portal. We also declare that during reverse auction:

- ❖ We will submit online sealed bid less than or equal to of our envelope sealed/ E-Procurement Portal price bid already submitted to BHEL along with the offer.

We also declare to submit the “Process Compliance Form” (to the designated service provider) as well as “Online Sealed Bid” in the Reverse Auction, in case BHEL decides to go for that.

Yours Faithfully,

(Signature, Date & Seal of Authorized  
Representative of the Bidder)

Date:

**BHEL PSWR  
Notice Inviting Tender**

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**ANNEXURE-7**

**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,

**Sub: Declaration for not being under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR**

**Ref: NIT/Tender Specification No: BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282/PKG-B/2283**

We, \_\_\_\_\_ declare that we are not under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render us ineligible for participation in this tender.

Yours Faithfully,

(Signature, Date & Seal of Authorized  
Representative of the Bidder)

Date:

Registered Office: BHEL House, Siri Fort, New Delhi – 110 049, India  
Website: www.bhel.com

2282-  
2283

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - I: PROJECT INFORMATION

1.0	<b>Project Information: NTPC Ramagundam TPS Stage-I&amp;II (3x200MW + 3x500MW) FGD Package.</b>
1.1	<p><b><u>INTRODUCTION:</u></b></p> <p>The proposed site is located at Ramagundam in Peddapalli district of Telangana.</p> <p>Latitudes : 18°45'18"N Longitudes : 79°27'22"E Place : Ramagundam District : Peddapalli Nearest Railway Station : Ramagundam (5 KM) Nearest Airport : Hyderabad (250 KM) Nearest Town/city : Karimnagar (51 KM)</p> <p><b>Above information furnished are for general guidance of Contractor. However, Contractor has advised to visit the site and appraise himself about the conditions of site and infrastructure available in the area for fulfilling their commitments under the contract.</b></p>

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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### 2.0 SCOPE OF WORK

The scope work for civil works under the specification covers the supply, storage at site, storage of material supplied by BHEL (i.e. taking delivery of materials from plant gate / BHEL stores, transportation to site), Civil and Architectural works as specified hereinafter but without excluding any other necessary components, which are not mentioned herein but are required for the completeness and efficient, easy and reliable operation of the system.

The works to be performed under this specification include execution of complete civil and architectural works for foundations for equipment, buildings, facilities, substructures, superstructures including inserts as per the detailed scope and specification enclosed elsewhere in this tender document. The works includes supply of all materials, consumables, tools etc. as per approved drawings and specification **On item rate basis.**

**Package-A:** Following area/structures are broadly covered under this Package:

(I) Civil and Architectural works of Main plant FGD Civil works of Unit #1,2&3 (3x200 MW) which covers the following:

1. Absorber foundation
2. RC pump +Oxidation Blower house
3. Duct support foundations from Old Chimney to absorber& absorber to wet stack.
4. Booster fan foundations
5. Misc. Sumps
6. MCC buildings
7. Miscellaneous equipment/pump foundations
8. Elevator- civil works
9. Instrument air receivers
10. SWAS room
11. Fire Pipe Trenches
12. Pipe Support pedestals
13. Any other structures (Civil & Architectural Works) related/required to complete FGD package.

(II) Common Facilities/ structures for FGD:

1. Misc. tank foundations
2. Transfer Pump House/ Pump House



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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3. MCC buildings
4. Misc. pump /equipment foundations & Misc. Sumps
5. Lime Stone Weigh Bridge
6. Limestone storage silo foundation
7. Ball mill building /lime stone building
8. Wet ball mill foundation
9. Limestone crusher house
10. Gypsum dewatering building
11. Transfer house
12. Truck tippler
13. Limestone conveyor trestle
14. Gypsum conveyor Trestle
15. Gypsum stock pile shed
16. Duct foundations
17. Pipe rack/cable rack foundations system from limestone slurry storage tank to Unit#1,2&3 and to Unit#4 main plant FGD area.
18. DV Shed
19. DG Set- civil works
20. Instrument air receivers
21. Transformer foundations
22. Road/paving & underground works
23. Sewage network
24. Storm water drainage system
25. Plumbing, sanitary works etc.
26. Dismantling & disposal of existing facilities e.g., roads, drains, pavements, buildings, underground foundations/facilities etc. as applicable required for construction of FGD facilities.
27. Restoration of dismantled existing facilities as applicable.
28. Providing underground facilities survey using Ground Penetration Radar (GPR) for Entire FGD area as per drawing and technical specification
29. Any other structures (Civil & Architectural Works) related/required to complete FGD package.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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### (III) Chimney Works:

1. **Wet stack for Unit#1,2&3:** Construction of 1Nos of 240m height RCC Single Flue Chimney complete in all respect including earth works, RCC works, fabrication & erection of steel flue cans, mini shell of Titanium as per specification, erection of shop fabricated structural platforms, installation of Borosilicate Glass Block Lining on Inner Surface of Steel Flue CAN, Supply & installation of electrical items, elevators etc in conformity with the approved layout & technical specifications to complete the chimney in all respect.
2. **Wet stack for Unit#5:** Construction of 1Nos of 150m height RCC Single Flue Chimney complete in all respect including earth works, RCC works, fabrication & erection of steel flue cans, mini shell of Titanium as per specification, erection of shop fabricated structural platforms, installation of Borosilicate Glass Block Lining on Inner Surface of Steel Flue CAN, Supply & installation of electrical items, elevators etc in conformity with the approved layout & technical specifications to complete the chimney in all respect.

The scope of work include supply of all materials, equipment and facilities required except Cement, Structural Steel, MS earthing rod, Reinforcement Steel (TMT) & shop fabricated steel structures and closed cell borosilicate glass block lining system that shall be supplied by BHEL free of cost as per Schedule of Items.

**Package-B:** Following area/structures are broadly covered under this Package:

- (I) Civil and Architectural works of Main plant FGD Civil works of Unit #4,5&6 (3x200 MW) which covers the following:
  1. Absorber foundation
  2. RC pump +Oxidation Blower house
  3. Duct support foundations from Old Chimney to absorber& absorber to wet stack.
  4. Booster fan foundations
  5. Misc. Sumps
  6. MCC buildings
  7. Miscellaneous equipment/pump foundations
  8. Elevator- civil works
  9. Instrument air receivers
  10. SWAS room
  11. Fire Pipe Trenches

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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12. Pipe Support pedestals

13. Any other structures (Civil & Architectural Works) related/required to complete FGD package.

### (II) Common System

1. FGD control room
2. Civil Work of DMCW and ACW Pump house
3. Tie Switch gear building/foundation
4. Miscellaneous equipment/pump foundations
5. Pipe & cable rack Civil works for Unit#5 &6 main plant FGD area, FGD control room and its inter connection with pipe and cable rack from lime stone slurry storage tank to Unit #1,2&3 main plant FGD area and Unit#4 main plant FGD area.
6. Any other structures (Civil & Architectural Works) related/required to complete FGD package.
7. Fire Pipe Trenches
8. DV shed
9. Pipe Support pedestals
10. Road/paving & underground works
11. Sewage network
12. Storm water drainage system
13. Plumbing, sanitary works etc.
14. Dismantling & disposal of existing facilities e.g., roads, drains, pavements, buildings, underground foundations/facilities etc. as applicable required for construction of FGD facilities.
15. Restoration of dismantled existing facilities as applicable.

### (III) Chimney Works:

1. **Wet stack for Unit#4:** Construction of 1Nos of 150m height RCC Single Flue Chimney complete in all respect including earth works, RCC works, fabrication & erection of steel flue cans, mini shell of Titanium as per specification, erection of shop fabricated structural platforms, installation of Borosilicate Glass Block Lining on Inner Surface of Steel Flue CAN, Supply & installation of electrical items, elevators etc in conformity with the approved layout & technical specifications to complete the chimney in all respect.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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2. **Wet stack for Unit#6:** Construction of 1Nos of 150m height RCC Single Flue Chimney complete in all respect including earth works, RCC works, fabrication & erection of steel flue cans, mini shell of Titanium as per specification, erection of shop fabricated structural platforms, installation of Borosilicate Glass Block Lining on Inner Surface of Steel Flue CAN, Supply & installation of electrical items, elevators etc in conformity with the approved layout & technical specifications to complete the chimney in all respect.

The scope of work include supply of all materials, equipment and facilities required except Cement, Structural Steel, MS earthing rod, Reinforcement Steel (TMT) & shop fabricated steel structures and closed cell borosilicate glass block lining system that shall be supplied by BHEL free of cost as per Schedule of Items.

However, the names of the structures mentioned may change on later change during detail engineering stage.

### **Interchangeability of Scope:**

**BHEL reserves the right to swap any particular scope of work/any portion of work between Package A and Package B of subject tender as per the requirement of the site during execution of the job. In no case Scope of any vendor should be allowed to reduce less than 85% of total contract value of any package due to invoking of this clause by engineer in charge.**

The scope of works mentioned above under “item rate basis” includes all works like, Providing underground facilities survey using Ground Penetration Radar (GPR), excavation, leveling & grading, dewatering, back filling, shoring & strutting, foundation works, super structures (RCC), sheeting (metal deck/ cladding), brick work, staircase, equipment foundations, foundation bolts, embedment, grouting, waterproofing, cementitious coating, walkways, openings, doors and windows with glazing, false ceiling, fencing, plumbing, waterproofing, sanitary works, down-comer pipes, plinth protection & grading, garland drain all-round the periphery of the structure, ramp in front of doors, roads, drains , other finishing works, dismantling & disposal of roads/drains/foundations as applicable for construction of new facilities as per drawing/ instruction of engineer in-charge, restoration of dismantled facility as applicable, etc for the total completion in all respect as per the approved drawings. The rates quoted shall be inclusive of all the works mentioned above for the total completion of structures.

Approved drawings shall be issued by BHEL for the works covered under item rate basis.

The work to be performed under this specification shall include all incidental items not mentioned or specified but reasonably implied or necessary for the completion and proper functioning of the plant, all in strict accordance with the specifications including revisions and amendments thereto as may be required during the execution of work.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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This specification covers the methodology to be followed for construction of all civil and architectural works for the completion of civil works of FGD package. Description of various items of work and nature of work involved under this specification are given hereinafter. The items, though not specifically mentioned, but are needed to make the system complete shall be treated as though included and the same shall also be furnished and erected / constructed unless otherwise specifically mentioned as excluded.

The bidder should also note the following details, pertaining to the scope of civil works under this specification:

- i) The civil works to be performed shall cover providing all labour, materials except free issue materials like **reinforcement steel and cement** mentioned elsewhere, construction equipment, tools and plant, scaffolding, supplies, transportation, all incidental items necessary for successful completion of the work. The work shall involve earthwork in excavation, levelling & grading, rig mobilization, dewatering, shoring and strutting, foundation works, back filling around completed structures and plinth protection, area paving, disposal of surplus excavated materials, concreting including reinforcement and form work, brick work, miscellaneous steel works, inserts, foundation bolt fixing, architectural items & finishes such as plastering, painting, flooring, doors, windows & ventilators, glass and glazing, rolling shutters etc., metal decking, permanently colour coated profiled steel sheeting, sandwich cladding sheet, anchor bolts, RCC, trenches with covers, laying and testing of water pipes, sanitation, water supply, drainage, damp proofing, fencing, water proofing and roads, drains other ancillary items.
- ii) The work shall be carried out both below and above ground level and shall include basements, equipment foundations, grouting, slabs, beams, columns, footings, rafts, walls, brick walls, stairs, trenches, pits, access roads, culverts, buildings for switchgear and control room, finishes, complete architectural aspects, drainage, sanitation, water supply (from terminal points to various buildings and all other civil, structural and architectural works associated with the complete Ash handling plant.
- iii) Access roads to all buildings/facilities including construction and maintenance of temporary access roads for approach to the building/facilities for construction/erection activities.
- iv) The scope of work also includes attending meetings at BHEL office at site / BHEL Nagpur office, Owner's place in Site or at places decided by Owner as and when necessary for review, discussions, co-ordination, etc.
- v) The scope of work also includes setting up batching plant with capacity of minimum 30 Cum. All machineries, equipments, tools tackles including transit mixer, vibrating needle, dewatering pump, roller, compactor, admixture etc. to be made available prior to concreting activity. All test samples to be taken in presence of BHEL/NTPC Engineer and joint protocol to be maintained by contractor.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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- vi) Contractor shall set up stores for Cement, sand, deck plate, bolts, aggregate etc and all are stored properly as per IS recommendation. Wastage due to lapse of storing will be on account of contractor.
- vii) Contractor shall maintain proper records of test reports, bar bending schedule and to be produced to concerned Engineer whenever required.
- viii) Contractor shall be responsible for coordinating with the erection agency as well as BHEL for maintaining proper line, elevation, coordinate as per drawing. Any mismatches/ fouling with existing structure to be highlighted to BHEL. Dismantling of structure due to lack of coordination/Survey will be on contractor's account.
- ix) BHEL will supply reinforcement, Cement to contractor on free issue basis. Supply of all other items including handrail, grating, foundation bolts, metal deck, shuttering item, inserts, water proofing material, admixture etc. will be done by contractor. All item to be supplied as per customer NTPC specification with prior approval from NTPC/BHEL.
- x) **Submission of construction methodology/procedure in line with the NTPC technical specifications and obtaining approval from NTPC/BHEL wherever applicable as per instruction of engineer in charge.**
- xi) Setting Up of Laboratory Works: -

The contractor shall set up his own laboratory in the very close vicinity of the work site **as per indicative field QA&QC laboratory set up (enclosed with this tender document)** and as the directions of engineer-in-charge.

The laboratory shall be equipped with latest testing equipment in sufficient number to carry out all the tests as required under a contract. The contractor should ensure that the equipment is available well in advance of starting of the work to avoid stoppage of work on this account.

All the tests shall be carried out by the contractor in the presence of the Engineer's representative and a joint record of all observations and results thereof shall be maintained, and available with the Engineer.

### 2.1 **CIVIL AND ARCHITECTURAL WORKS**

The scope covers all Civil and Architectural works within the battery limits of Package-A and Package-B.

The important works covered under this package are as below:

- 2.1.1 Excavation of earth and backfilling including dewatering of excavations for foundations, trenches, pits, etc. till the construction of the same is completed and disposal of surplus earth.



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- 2.1.2 Construction foundation with pedestal for all civil structures, trenches, tunnels, sumps, grade beams, tie beams at foundation level, grade slabs, floor slabs and roof slabs at any height, equipment foundations etc.
- 2.1.3 Preparation and submission of detailed calculations, arrangement drawings and detail drawings of formwork, staging and scaffolding for all reinforced concrete structures and foundations as directed by the Engineer for his checking and approval.
- 2.1.4 Preparation of detailed working drawings and bar bending schedule for all reinforced concrete work and getting them approved before start of work by the BHEL Engineer.
- 2.1.5 Taking delivery of TMT Steel, structural steel, earthing rod, GI flat, GI grating, MS Rails etc. from BHEL stores/ storage yards for utilisation in construction work under this package.
- 2.1.6 Fabrication and fixing of templates/frames, inserts, fixing of anchor bolts, sleeves, and embedments etc. in concrete.
- 2.1.7 Supply of all instruments and personnel for conducting necessary tests at site as specified/as directed by the Engineer.
- 2.1.8 Mix Design( M 15, M 20, M 25 ,M 30, M 35/M 40 ) or as required for all concreting works including Chimney works as per schedule of items and technical specifications shall be carried out either at site or from a reputed institute approved by NTPC, contractor has to ensure adding of admixture and minimizing of cement content in line with IS 456 as advised by BHEL time to time without any additional cost.

## 2.2 Chimney Works

- 2.2.1 The work comprises of construction of 150m/240m high Reinforced Concrete Single flue Chimney complete Foundation works, RCC Shell, Internal Steel Platforms, Staircase, Fixtures, Fittings, Conduit and other Embedment, Lift (inside windshield), Ventilation etc. complete, insulation and provision of other accessories including external platforms, fabrication and fixing of flue duct inside the chimney, complete interior and Air Aviation Obstruction lighting system, gas sampling ports, opacity measurement ports, lightning protection and grounding system, doors for access to the shell, external platforms and inspection of the liners, ladders, communication system components, embedment for installation of equipment and fixtures and painting both internal and external of the chimney shell as well as of all doors, stairs, ladders and other structural steel items in accordance with this specification and approved drawings.
- 2.2.2 The contractor shall prepare, at his own cost, the detailed working drawings showing all details of the formwork staging (adequacy to be supported by design calculations) and other arrangements for the concreting work and

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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submit six copies of the same for the approval of the Engineer-in-Charge /consultants and only on the receipt of the approval of the consultants the work shall be taken up. However, the Owner's approval of the design/drawings shall not absolve the Bidder of his responsibility for correctness of design, accuracy of dimensions, loadings, details, etc., or safety and stability of the structure including foundations, accessories, appurtenances, etc. Any modifications/change in subsequent revisions of design/drawings shall be clearly marked and identified with a revision for the Owner's review/approval. All modifications suggested by the Owner to meet specification requirements and sound engineering practice, shall be incorporated by the Bidder at no extra cost to the Owner.

- 2.2.3** The contractor shall prepare, at his own cost, the detailed working drawings showing all Electrical details and Elevator details and shall submit six copies of the same for the approval of the Engineer-in-Charge /consultants and only on the receipt of the approval of the consultants the work shall be taken up.
- 2.2.4** Supply including design, receipt, unloading, erection, testing and commissioning of stack elevator and electrical equipment; allied items, cabling, earthing, spares etc. are also under the scope of this of work.
- 2.2.5** Installation of Borosilicate Glass Lining inside MS Flue CANS, including surface preparation, application of primer, adhesive etc. as per the technical specifications and approved erection procedure under the expert supervision of Borosilicate Glass Lining manufacturer /supplier.
- 2.2.6** The complete works have to be carried out by providing all labour, supervision, materials, scaffolding, power, fuel, construction equipment, tools & plants, inspection, measuring, testing instruments, supplies, transportation, storage, and all incidental items not herein specifically mentioned but reasonably or found required for the successful completion of work.
- 2.2.7** Cement, Structural Steel, Reinforcement Steel (TMT) & shop fabricated steel structures (as per schedule of items) shall be supplied by BHEL free of cost.
- 2.2.8** Borosilicate Glass Lining Materials, primer, adhesive (suitable fixing materials) and Expert Supervision of Manufacturer shall be provided by BHEL as Free of Cost Items.

### **2.3 General Scope:**

- 2.3.1** Furnishing all labour, materials, supervision, construction plans, equipment, supplies, transport, to and fro the site, fuel, compressed air, and all other incidental items and temporary works not shown on specified but reasonably implied or necessary for the proper completion, maintenance and handling over the works, except in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provide by the engineer during the course of works.



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- 2.3.2 Furnishing samples of all materials required by the engineers for testing/inspection and approval of BHEL/NTPC for use in the works. The samples may be retained by the engineer for final incorporation in the works.
- 2.3.3 Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the engineer.
- 2.3.4 Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that is required for all works including temporary works.
- 2.3.5 Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified.
- 2.3.6 Carrying out topographic survey of the entire and establish levels and coordinates at suitable intervals from existing grid levels and coordinates furnished by the owner established bench marks, setting out the locations and levels of proposed structures, constructions and marking of reference pillars and other identification works etc., The contractor shall provide the owner/BHEL such a assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used.
- 2.3.7 Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract.
- 2.3.8 Arranging for joint checking (with BHEL/BHEL's Customer/Consultant) of all site construction activities Preparation of joint protocols for each & every activity and maintaining quality records for audit/inspection as per approved FQP by BHEL.
- 2.3.9 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.**

- 2.3.10 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 imply and necessary for completion of the job as a whole all as desired and as directed by the engineer.
- 2.3.11 The detail 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 as per RFC Drawings.
- 2.3.12 The contractor shall provide adequate storage, testing and office facilities with approval from the engineer. The rate quoted by the contractor shall be deemed to include for these and no separate payment will be made towards these. On

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – II: Scope of Works and Technical Specifications

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completion of work, the site shall be cleaned by the contractor of all materials, temporary sheds, debris, rubbish plants and equipments, belonging to the contractor at no extra cost. The site and surroundings shall be handed over in neat and clean conditions. Periodical house keeping shall be done by contractor as per the instructions of BHEL and NSPCL at no extra cost. In case of any failure by the contractor, the employer will get set at risk and cost of the contractor. The construction site, office premises, roads etc. shall be maintained dust free with periodic water sprinkling or suitable methods without any extra cost to BHEL.

### 2.4 **WORKS BY OTHERS**

No work under the specification will be provided by any agency other than the contractor unless specifically mentioned elsewhere in the contract.

### 2.5 **SITE VISIT**

Contractor should visit project site, to acquaint himself with the conditions prevailing at site and in and around the plant premises, together with all the statutory, obligatory, mandatory requirements of various authorities before submission of the bid.

### 2.6 **Carrying out work by BHEL**

BHEL reserves the right to withdraw/restrict/alter the quantum of works as per clause No. 2.7 of GCC.

#### **NOTE:**

**Contractor has to make him well conversant with the Customer specification. In case of ambiguity between BHEL and customer specification, customer specification shall prevail.**

### 2.7 **PREAMBLE FOR THE SCHEDULE OF QUANTITIES/BOQ.**

2.7.1 Details of the items in this Schedule shall be read in conjunction with the Corresponding Consultants/NTPC specifications, drawings and other documents and shall have precedence over any contrary statement mentioned anywhere in this document.

2.7.2 The work shall be carried out as per construction drawings, specifications, the description of the items in this schedule and/or Engineer's instructions, Drawings enclosed with these documents are only indicative giving some idea of the type of work involved. The layout, sizes and details of the building, structures and foundations shown in tender drawings may vary at a large extent during actual construction. Final drawings will be issued progressively during the execution of the work.

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- 2.7.3 Items of work provided in this schedule but not covered in the specifications shall be executed strictly as per instructions of the Engineer.
- 2.7.4 Unless specifically mentioned otherwise in the contract, the bidder shall quote his rates for the finished items and shall provide for the complete cost towards fuel, tools, tackle, equipment, constructional plant, temporary works, labour materials, levies, taxes, transport, layout, repairs, rectification, maintenance till handing over, supervision, shops, establishments, services, temporary roads, revenue expenses, contingencies, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the works according to the contract.
- 2.7.5 The rate quoted shall be inclusive of cleaning the site of any vegetations, dressing and levelling etc., required for commencement of site activities. The rates shall also be inclusive of final micro grading before handing over. No separate payment will be made towards the same.
- 2.7.6 The rate shall also be inclusive of carrying out topography survey of site to establish levels and coordinates at suitable intervals, from existing grid levels and coordinates furnished by the owner, establish bench marks, setting out the location and levels of the proposed structures, constructions and making references, pillars and other identification marks etc. No separate payment will be made towards the same.
- 2.7.7 The quantities of the various items mentioned in the schedule are approximate and may vary up to any extent or be deleted altogether. The overall variation in contract value on execution shall be dealt as per GCC. Contractor has to obtain prior approval of BHEL/NTPC before procurement of bought out items/building materials.
- 2.7.8 Engineers decision shall be final and binding on the contractors regarding clarification of items in this schedule with respect to the other section of the contract.
- 2.7.9 In case of any discrepancy between item description, relevant drawing and/or specification Clarification shall be sought at tender stage itself. Otherwise it shall be assumed that the bidder has quoted for the more stringent requirement.
- 2.7.10 Mix design (M 20, M 25, M 30, M 35/M40) for all concreting shall be carried out either at site or from a reputed institute, contractor has to ensure adding of admixture and minimizing of cement content in line with IS 456 as advised by BHEL time to time without any additional cost.
- 2.7.11 The scope shall also include setting up by the bidder a testing laboratory (one AC lab size 4.5mtrx6mtr and 1 non AC lab 4.5 mtrx4.5 mtr.) in the field to carry out all relevant tests. Detail of laboratory equipment's as per NTPC specification to be arranged by the contractor within quoted rate for conducting day to day tests. The contractor may tie up with

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approved/registered inspection agencies for setting up test lab at site as described above.

2.7.12 Installation of necessary amenities- temporary infrastructure for construction activities at Project site locations- following are the minimum amenities to be provided by the bidder without any extra cost and removal/disposal of the same in environment friendly manner after its intended use/completion of complete scope of work:

1. Labour rest sheds near work spot.
2. Canteen facility creation.
3. Drinking water facility.
4. Labour toilets near work spot in sufficient nos. with regular cleaning & maintenance arrangement
5. Labour colony should have all hygienic condition, dining hall, toilets, proper sewerage system, good drinking water arrangements.

**NOTE:** In case of non-compliance of above points, BHEL will make penal recoveries at the rate decided at site mutually by BHEL and contractor or as imposed by NTPC.

## 2.8 **HIERARCHY**

In case of any conflict/deviations amongst various documents, the order of precedence shall be as follows

- 1) Statutory Regulations
- 2) NTPC Technical specification/Section C Technical specifications.
- 3) Items in Schedule of quantities
- 4) IS standards
- 5) BHEL's standard specification (Section D).

**The above hierarchy shall be followed strictly for technical requirements only to carry out works under the scope of this contract.**

2.9 Laying / Cutting & Re-welding of associated electrical earthing works below the road & drains and surrounding areas shall also be done by civil contractor as per drawings for which 40mm dia. MS rod/GI flats shall be supplied by BHEL free of cost.

## 2.10 **Construction Power:**

2.10.1 Construction power (three phase, 415 V/ 440 V) will be provided near the site at a distance of approx. 500M on chargeable basis (source of construction power shall be provided at two locations). Further distribution shall be arranged by the contractor at his own cost and services. Contractor shall be responsible for fulfillment of all requirements including statutory

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requirements in this regard. Contractor shall deploy and install required energy meter, cables, fuses, LT distribution boards, switchboards, bus bars, earthing arrangements, protection devices i.e, required capacity ELCB/RCCB in outgoing feeders and any other installation as specified by statutory authority/act. Contractor shall also obtain approvals of appropriate authority and pay necessary fees, levies etc towards the clearance of such installations, prior to use. Sufficient power factor compensation equipments like capacitor shall be provided by contractor for reactive loads like welding machines etc. In case of any fine/penalty on account of low power factor, same shall be shared by contractor proportionately according to power consumption.

- 2.10.2 Contractor shall make necessary arrangements for onward distribution of construction power taking due care of surrounding construction activities like movement of cranes & vehicles, civil work, fabrication/construction/assembly/ erection etc and safety of personnel. It may become necessary to relocate some of the installations to facilitate work by other agencies or by him.
- 2.10.3 It shall be the responsibility of the Contractor to provide, maintain the complete installation on the load side of the supply with due regard to the safety requirements at site. All cabling and installations shall comply in all respects with the appropriate statutory requirements. The installation and maintenance of this shall be done by licensed and experienced electrician.
- 2.10.4 While reasonable efforts will be made to ensure continuous electric power supply, interruptions cannot be ruled out and no claim from the Contractor shall be entertained on this account such as idle labor, extension of time etc. The Contractor shall adjust his working shift accordingly and deploy additional manpower, if necessary, so as to achieve the target.
- 2.10.5 Contractor shall be well equipped with back-up power supply arrangement like DG set and diesel operated welding machine etc to tackle situations arising due to failure of supplied power, so as to ensure continuity and completion of critical processes that are underway at the time of power failure or important activities planned in immediate future.
- 2.10.6 BHEL is not responsible for any loss or damage to the Contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply.
- 2.10.7 Contractor is advised to maintain the calibrated energy measuring instruments and use their system as efficiently as possible. to maintain the HT side input energy meter reading and LT side outgoing energy meter reading to sub-contractors as equal. In case there is any difference between the sum of the LT side meter readings of all sub-contractors and the HT side meter reading of M/s NTPC, same shall be distributed proportionately among all sub-contractors working during the respective calendar month.

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- 2.10.8 The bidder will have to Procure & install General mobile illumination system during construction right from start of his work. This system will include temporary pole lighting, portable lighting towers with DG back-up, within the quoted price. The illumination should be such that minimum illumination requirement as specified by Indian standards for general illumination is maintained.
- 2.10.9 The charges only for the actual energy consumed by the contractor shall be recovered based on prevalent rate of DISCOM.

### **GENERAL: -**

If any other voltage level (other than normally available) is required, the same shall be arranged by the contractor from power supply as above. Contractor will have to provide at his own cost necessary calibrated energy meters (tamper proof, suitably housed in a weather proof box with lock & key arrangement) at point of power supply along with calibration certificate from authorized / accredited agency for working out the power consumption. In case of recalibration required for any reason the necessary charges including replacement by calibrated meters is to be borne by the contractor. Supply of electricity shall be governed by Indian Electricity Act and Installation Rules and other Rules and Regulation as applicable. The contractor shall ensure usage of electricity in an efficient manner and the same may be audited by BHEL time to time. In case of any major deviation from normally accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.

### **2.11 Construction water:**

Contractor shall make all arrangements himself for the supply if construction water as well as potable water for labour and other personnel at the work site/ colony. However, drawl of construction/ potable water from the bore-well shall be permitted if found suitable. Any statutory clearance required shall be obtained by the contractor. Assistance, if required shall be provided by the BHEL/NTPC.

### **2.12 Field Quality Assurance:**

The contractor shall be responsible for day-to-day quality checks of concrete and other building materials during the progress of work. All quality records and log sheets shall be maintained as per the requirement of BHEL/BHEL'S customer and as per field quality plan approved by BHEL/NTPC.

### **2.13 Reconciliation of Material issued by BHEL (free of cost):**

#### **2.13.1 General Notes:**

- (a) Cement and Reinforcement Steel required for the tender scope shall be procured by BHEL and issued to contractor free of cost (As FOC Item). However, unloading, handling / storage of Cement and Reinforcement steel procured by BHEL for this tender scope, at site, inside BHEL Stores /



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Contractor's Stores and further transportation from Stores to work area will be in the scope of contractor. No Extra payment shall be made for this work.

- (b) BHEL reserves the right to recover from the contractor any loss arising out of damage/ theft or any other causes or during verification/stacking or at any time under the custody of the contractor.
- (c) The contractor shall take care of material issued by BHEL and shall protect the same from damage and weathering. Contractor shall construct waterproof cement store (**capacity minimum 500 MT/ 10000 Bags**) for storing and stacking of cement **issued by BHEL free of cost**.
- (d) The contractor shall in no case be entitled for any compensation on account of any delay in supply or non-supply thereof for all or any such materials. However, in case of non-availability of any specific section(s) which delays the completion of work, such cases shall be recorded separately in monthly planning format (F14) and shall be considered for time extension of contract.
- (e) Contractor will have to make his own arrangement at his own cost for procurement of any other materials except as mentioned above, as required for the works and of such quality as acceptable to BHEL.
- (f) The contractor shall maintain proper store account for all the BHEL issued materials and shall give **Three (03) copies of monthly-computerized reconciliation statement** of such account showing total receipt, consumption and balance at site to the BHEL. BHEL Engineer's certification for the reconciliation of steel shall be final. The detailed reconciliation (dia. Wise or as required) shall be done **at least once in three months (03) or before submission of final bill which comes earlier**.
- (g) Contractor shall also carryout in complete association with BHEL, the material management functions and execution like day-to-day update of materials, issued to contractor, accounting for surplus/scrap material returned etc. These functions shall also be carried out through computerized system utilizing suitable software. Contractor shall engage experienced software personnel to associate on dedicated basis for efficient discharge of the same in time.
- (h) The contractor shall solely be responsible for the safety & security of material after it is handed over and issued to contractor by the BHEL.
- (i) BHEL issued materials, shall not be under any circumstances whatsoever, and shall be taken out of the project site unless otherwise permitted by BHEL for outside job.

### 2.14 HANDLING OF MATERIALS ISSUED BY BHEL:

2.14.1 Materials shall be issued by BHEL based on the weighment basis/linear measurements & sectional weight. However, on specific request of the

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contractor **“as a special case to expedite the job”** the consignment received at BHEL stores can directly be diverted to the work site following issuance procedure of BHEL. Such direct issues shall be as per the Challan/dispatch document/LR received with the consignment. In such cases, Contractor shall do unloading of materials from trucks/lorry at their own cost.

- 2.14.2 All materials issued by BHEL shall be stacked, stored above ground level **by use of concrete or wooden sleepers. No materials shall remain on ground at any time.** All concrete or wooden sleepers required for stacking the materials shall be arranged by contractor (successful bidder of this package) at his own cost within the quoted rates. All other equipments like winches, D-Shackles, slings of various sizes, max puller, pulley blocks, jacks, trucks, trailers etc. Required for such handling of steel from BHEL stores/storage yard etc. Shall be arranged by contractor within quoted/accepted rates.
- 2.14.3 The contractor shall take delivery of the materials from the designated place within the project premises at his own cost and store the same at his stores as per standard norms. Open land for such purposes shall be provided by BHEL on free of cost basis. Temporary barbed wire fencing of the open storage yard is to be done by the contractor and is included under the scope of his work. Contractor shall also remove grass, bushes, trees etc wherever required off the land provided to him and shall make proper continuous up keeping of the open yard /land by removing grass, bushes trees etc and same is included under the scope of his work & No extra payment shall be made to the contractor in this regard. The bidder shall make complete arrangement of necessary security personnel's to safeguard all such materials in his custody. Materials issued will be used only for construction of permanent works. The contractor shall take care of material issued by BHEL and shall protect the same from theft, damage and weathering. Excessive rusting of steel in custody of agency/contractor must be avoided. **In case, due to any cause attributable to the contractor, such rusting of steel occur rendering the same unusable, then such quantity of steel shall be recovered from the interim payment at the penal rate specified in the tender.**

### **2.15 Issue of Cement (Free of Cost)**

- 2.15.1 Cement as received from the manufacturer/ stockiest will be issued free of cost to the contractor. The theoretical weight of each bag of cement for issued purposes will be considered as 50 kg, the contractor shall be accountable for the cement issued to the contractor on this notional weight only. No claim whatsoever will be entertained because of difference between theoretical and actual weight of the bags of cement.
- 2.15.2 In case cement is issued through bulkers being supplied from manufacturer/stockiest; the same shall be emptied in cement silos of batching plant and necessary assistance shall be provided by contractor.



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- 2.15.3 In case BHEL supplies cement through Bulker, Bidder has to store cement in Silos of Suitable capacities as decided by Engineer in charge. Silos Capacities shall be finalized mutually.
- 2.15.4 The empty cement bags duly accounted for against issue shall be the contractor's property and the same shall be disposed as per statutory regulation prevailing in the project.
- 2.15.5 No cement will be issued on free basis for bought out item like Hume pipe, Interlocking Paver block, Fly ash brick etc. However cement for mortar for fixing of these items if required will be issued on free basis.

### 2.16 ISSUE OF STEEL.

- 2.16.1 The steel shall be issued to the contractor on the following basis:
- Structural Steel: Weight basis (Unit – MT)
  - Reinforcement Steel and Earthing Rod: Weight basis (Unit-MT)
  - GI Gratings: Weight Basis(Unit- MT/As Received from manufacturer)
  - MS Rails: Weight Basis (Unit-MT)
- 2.16.2 All the steel (structural, reinforcement, earthing rod/GI flats, GI gratings, foundation bolts, MS Rails) issued by BHEL shall be properly accounted for. The total quantity of steel required for the work will be calculated from the approved Bar Bending schedule, fabrication drawings, approved laps, chairs and lugs etc. The measurement for payment as well as for accounting shall be based on the sectional weights as indicated in the following IS/BS/EN specifications.

Sr No	Name of Standard	Name of Section
1	IS: 808-1964	Beams, Channels and Angles
2	IS: 1730-1961	Plates, Sheets and Strips/Flats
3	BS4-1: 1993	UB/UC sections
4	IS: 12778/equivalence with EN-19-57	For NPB sections
5	IS: 12778/equivalence with EN-53-62	For HE/WPB sections
6	IS: 1786 or grade -1 of IS432 (Part-I)	Rounds including deformed high yield strength bars.

**In case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding.**

- 2.16.3 The steel issued to the contractor shall be mainly in standard length and sections as received from the supplier. However, the contractor shall be bound

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to accept the steel in length as available in the project stores, no claims for extra payment because of issue of non-standard length will be entertained.

- 2.16.4 The contractor shall satisfy himself of the quality and quantity of the materials at the time of taking delivery from BHEL stores. No claims whatsoever will be entertained by BHEL because of quality or quantity after the materials are taken by the contractor from BHEL stores.
- 2.16.5 The contractor shall submit to BHEL, a statement indicating estimated quantity of **cement and steel** required during a quarter. In addition, the contractor shall also furnish the estimated requirement of steel during a month by the third week of the previous month indicating his requirement.
- 2.16.6 Following shall be limit for the maximum quantity of BHEL issue materials that would be with the contractor at any point of time when work is in progress (excluding what has already been incorporated in the works).

SL No.	ISSUE OF MATERIALS	MAX QUANTITY IN CONTRACTORS STORE
01	Reinforcement steel, earthing rod/GI flat, GI grating, Foundation bolts,	ONE MONTH
02.	Cement	ONE MONTH

- 2.16.7 Bidders shall ensure that no lamination material is taken over by them from BHEL.
- 2.16.8 The contractor must note that cement and steel required for the contractor's enabling job like store/ site office/batching plant/temporary works etc. shall be arranged by the contractor at his own cost.

### 2.17 RETURN OF MATERIALS

- 2.17.1 **Return of Cement:** Sealed cement bags remaining unused and in perfectly good condition at the time of completion or termination of the contract shall be returned promptly, (within 15 days from assessment) if BHEL/ engineer is satisfied of the physical condition of the cement. Return of such cement to the project stores / place as identified within the project area by engineer/ BHEL will not be entitled to handling and incidental charges. Surplus sealed and good conditioned cement bags will be taken back on weighment basis.
- 2.17.2 **Return of Reinforcement Steel and Structural Steel including Scrap:** All surplus steel and all wastage materials will be taken back on weighment basis. Surplus, unused and untampered steel shall be sorted section-wise and returned separately at a place directed by BHEL/Engineer within the project area. Return of such materials will not be entitled to any handling and incidental charges. All wastage / scrap (including melting scrap, wastage, and unusable scrap) shall be promptly returned to the stores and a receipt

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obtained for material accounting purposes. Return of such material will not be entitled to any transportation and incidental charge. Scrap for reinforcement steel and structural steel shall be returned separately.

### 2.18 **Scrap and Serviceable Materials:**

- 2.18.1 All structural steel of length above 2 M except M.S Plate shall be considered as **serviceable materials** provided the materials is in good and acceptable condition. Structural steel in length less than 2 M Shall be treated as scrap.
- 2.18.2 Plates having both side greater than 1 Meter OR if any side is less than 1 M but greater than 0.5 M and the total area is equal or greater than 2 sq. Meter shall be considered as **serviceable material**.
- 2.18.3 All pipe measuring 2 M and above in length shall be treated serviceable materials provided they are in good and acceptable condition. Pipe in less than 2 M length shall be treated as Scrap.
- 2.18.4 All TMT measuring 3 M and above in length shall be treated as **serviceable material** provided they are in good acceptable condition. TMT in less than 3 M shall be treated as scrap.

### 2.19 **Cement, Steel Consumption and wastage:**

#### 2.19.1 **Cement Consumption:**

The theoretical consumption of cement shall be based on the following:

- a. For design mix concrete as per approved design mix.
- b. For nominal mix concrete work, as per minimum cement as specified or as approved by engineer-in-charge.
- c. For item of works, where volume mix is permitted in writing by the BHEL, for masonry works, plaster other miscellaneous items, the cement consumption shall be governed by the "Statement of cement consumption" attached to the DSR-2013 unless otherwise specified in the specifications or the drawing of contract or mutually agreed by engineer-in-charge and the contractor.
- d. Actual consumption = Issue – Surplus/ unused quantity of cement returned in good condition by the contractor to store. (No sweep cement will be taken back by BHEL).

#### 2.19.2 **Cement Wastage:**

- 2.19.2.1 **Allowable wastage:** One and half percent (+1.5%) of theoretical consumption of cement.
- 2.19.2.2 For any material issued by BHEL to the contractor free of cost, and which is not accounted for by the contractor to BHEL, then recovery for such material shall be affected at penal rates.

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Sl no.	Cement consumption	Basis of issue & penal recovery
C-1	Theoretical consumption (without considering any wastage or loss).	Free
C-2	Actual consumption being Limited to one and half percent (+1.5%) of aforesaid theoretical consumption towards allowable wastage.	Free
C-3	Actual consumption beyond one and half percent (+1.5%) of above (C-1).	Penal rate

### 2.19.3 Reinforcement Steel, MS earthing rod, GI gratings, Foundation bolts and MS Rails Consumption

The theoretical consumption of various sections and/or diameter of reinforcement and earthing rod steel shall be based on approved construction drawing and bar bending schedule. Weight shall be calculated considering the sectional weights as per Indian standards. No extra cost shall be payable to the contractor for any deviation in weights for the different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances.

2.19.3.1 Actual consumption = Issue – Surplus.

2.19.3.2 Surplus = un-tampered, unused, uncut QTY of steel **including serviceable material returned** by the contractor to BHEL store along-with relevant documents.

2.19.3.3 Wastage = Actual consumption – Theoretical consumption.

### 2.19.4 Reinforcement Steel, MS earthing rod, GI gratings, Foundation bolts and MS Rails Wastage

2.19.4.1 **Allowable Wastage:** (+3%) of the theoretical consumption shall be considered as allowable wastage.

Wastage and scrap shall be as per actual weighment basis.		
Sl no.	Reinforcement steel & MS earthing rod	Basis of issue & penal recovery
R-1	Theoretical consumption (without considering wastage and scrap or loss)	Free
R-2	Wastage limited to <b>plus THREE</b> percent (+3%) of aforesaid theoretical consumption (R-1) towards allowable wastage.	Free
R-3	Wastage beyond <b>THREE</b> percent (+3%) of the theoretical consumption above (R-1).	Penal rate

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### 2.20 Reconciliation of Materials:

- 2.20.1 The contractor shall submit a reconciliation statement of cement and steel issued to the contractor with each RA Bill.
- 2.20.2 At the time of submission of bills, the contractor shall properly account for the material issued to him as specified herein to the satisfaction of BHEL certifying that the balance material are available in the contractor custody at site.
- 2.20.3 At the time of submission of bills, if it is noticed by BHEL that the wastage is high and calls recovery at the penal rate, then, BHEL will proceed for recovery for the excess wastage as per penal recovery rates as specified.
- 2.20.4 The reference drawings for actual material consumption to be used for the purpose of reconciliation shall be drawings prepared by the BHEL and drawings approved by BHEL for fabrication works and such other drawings approved by BHEL. This shall also include the bar bending schedule prepared by the contractor and approved by BHEL.

### 2.21 Recovery of Materials (Penal Rates):

If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly RA Bills as per following penal rates:

Sl. No.	Items	Penal Rates (Rs.)
P-1	Cement (OPC/ PPC/ PSC).	6,500 per MT
P-2	Reinforcement steel and MS earthing rod/GI flat	65,000 per MT
P-3	MS Flats, beams, channel, angels etc. (Rolled Sections)	65,000 per MT
P-4	Foundation bolts if supplied by BHEL	90,000 per MT

### 2.22 Procurement and Testing of Materials by Contractor:

Material required for the entire job (other than issued by BHEL as explained above) like sand, aggregates, windows, doors, ventilators, rolling shutter, sanitary fixtures, painting & finishing material, electrical fittings and wiring material and all other material required for the completion of entire scope have to be arranged by the contractor, except those specifically indicated as BHEL scope of supply. BHEL reserves the right to reject any material not found satisfactory. Rates quoted shall be inclusive of all such contingencies and no additional payment shall be made on this account. For this purpose, sample shall be collected at site in presence of **BHEL/NTPC** representative.

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### **Bidders are requested to specifically note the following:**

*Bidders are requested to have **pre-bid visit/ inspection of site** to make them fully acquainted with the site situation & nature of job. No claim shall be entertained at later date on account of non-familiarization of site conditions. Bidders may fix up their site visit in consultation with below mentioned contact person:*

Sh. Sunil Kumar Kodape Construction Manager BHEL Site Office NTPC Ramagundam Stage-I&II FGD Project Mob No.: 940495099	Sh Paritosh Kumar PSWR Nagpur Ph no: 9717888794
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## Chapter – III: Facilities in the scope of Contractor/BHEL

Sl.No	Description  <b>PART I</b>	Scope		Remarks
		BHEL	Bidder	
3.1	<b>Establishment</b>			
3.1.1	<b>For Construction Purpose:</b>			
A	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
B	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
C	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
D	Bidder's all office equipments, office / store / canteen consumables		Yes	
E	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
F	Fire fighting equipments like buckets, extinguishers etc		Yes	
G	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	<b>For living purpose of the bidder</b>			
A	Open space for labour colony (as per availability)		Yes	Contractor has to make his own arrangements for shelter and transportation of labours as per requirement.
B	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	<b>ELECTRICITY</b>			
3.2.1	<b>Electricity for construction purposes 3 Phase 415/440 V</b>			CHARGEABLE
A	Single point source	Yes		CHARGEABLE. At two locations. Further distribution and Metering is in scope of bidder. Refer clause 2.10



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## Chapter – III: Facilities in the scope of Contractor/BHEL

Sl.No	Description  <b>PART I</b>	Scope		Remarks
		BHEL	Bidder	
B	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
C	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	<b><i>Electricity for office, stores, canteen etc of the bidder.</i></b>			
A	Single point source	Yes		Chargeable. Contractor Has to make his own arrangements from point source as per 3.2.1.A
B	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
C	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	<b><i>Electricity for living accommodation of the bidder's staff, engineers, supervisors etc</i></b>			Contractor Has to make his own arrangements
A	Single point source		Yes	
B	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
C	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	<b><i>WATER SUPPLY</i></b>			
3.3.1	<b><i>For construction purposes: (to be specified whether chargeable or free)</i></b>			
A	Making the water available at single point		Yes	Contractor has to make his own arrangement.
B	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	<b><i>Water supply for bidder's office, stores, canteen etc.</i></b>			
A	Making the water available at single point		Yes	



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## Chapter – III: Facilities in the scope of Contractor/BHEL

Sl.No	Description  <b>PART I</b>	Scope		Remarks
		BHEL	Bidder	
B	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.3	<b>Water supply for Living Purpose</b>			Contractor has to make his own arrangement.
A	Making the water available at single point		Yes	
B	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.4.0	<b>LIGHTING</b>			
A	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
B	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3 At the construction site /area		Yes	
C	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	
D	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	<b>Communication facilities for site operations of the bidder</b>			
A	Téléphone, fax, internet, intranet, e-mail etc		Yes	
3.6.0	<b>Compressed air wherever required for the work</b>		Yes	
3.7.0	<b>Demobilization of all the above facilities</b>		YES	
3.8.0	<b>Transportation</b>			
A	For site personnel of the bidder		Yes	
B	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – III: Facilities in the scope of Contractor/BHEL

Sl.No	PART II Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
<b>3.9.0</b>	<b>Erection Facilities</b>			
3.9.1	Engineering works for construction:			NOT APPLICABLE
A	Providing the erection/constructions drawings for all the equipments covered under this scope	Yes		<b>For Details Pl refer Chapter-IX-</b>
B	Drawings for construction methods	Yes	Yes	In consultation with BHEL
C	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site		Yes	Changes are to be marked in drawing & handover to BHEL on completion of work.
D	Shipping lists etc for reference and planning the activities			NOT APPLICABLE
E	Preparation of site erection schedules and other input requirements	Yes	Yes	In consultation with BHEL
F	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
G	Weekly erection schedules based on SI No. e		Yes	In consultation with BHEL
H	Daily erection / work plan based on SI No. g		Yes	In consultation with BHEL
I	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	

**Note: Additional single point source for construction power may be provided on chargeable basis based on availability of such sources**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – IV: T&Ps AND MME TO BE DEPLOYED BY CONTRACTOR

### 4.1 Tools & Plants:

Nos of T&Ps to be deployed at site shall be decided w.r.t. monthly plan and review format (F-14) based on site requirement. Below given Nos are tentative for planning purposes by the bidder.

For Package-A & Package-B each:

Sl No.	Description of T&P	Quantity
1.	Concrete batching plant (30 Cum/Hr.)	01No. or more as per requirement
2.	Concrete Pump (30/45 Cum/Hr min capacity & lift 50M)	02No. or more as per requirement
3.	Multi stage high lift water pump (for curing) lifting height 170 meters). One shall be working type and other shall be stand by for each chimney.	04 Nos or more as per requirement
4.	<b>TYRE MOUNTED CRANE 75 MT (For fabrication and erection of Flue cans)</b>	<b>1 Nos./as per requirement</b>
5.	SLIP FORM SHUTTERING & necessary spare parts	2 Set
6.	Concrete Transit Mixer	03 Nos or more as per requirement
7.	Concrete Boom placer	As per requirement.
8.	SLUDGE / SLURRY PUMP ( DIESEL / ELEC )	As per requirement.
9.	Electrical Winch (of required capacity)	As per requirement
10.	Vibrators(electrical/diesel)	10 Nos
11.	Air Compressor/Air blower	01 No.
12.	Concrete breaker ( HILTI/STANLEY or equivalent)	01 No.
13.	Power Trowel	As per requirement
14.	Groove Cutting Machine	As per requirement
15.	Welding Machine	As per requirement
16.	Self-priming Dewatering pump of various capacity (Diesel/Electric) From 2 HP to 7.5 HP	As per requirement
17.	Curing / dewatering pump – 1.5 / 2 HP	06 Nos or more as per requirement
18.	Hydraulic Excavator /Poclain	As per requirement.
19.	JCB	As per requirement.
20.	<ul style="list-style-type: none"><li>Ply Shuttering board with adequate supporting structure – (Old steel shuttering plates will not be allowed).</li><li>Steel shuttering (fare face)</li></ul>	Lot (As per requirement)
21.	Hydra crane (12/14 MT Capacity)	As per requirement.
22.	Trailer (20MT Capacity)	As per requirement.
23.	Tractor mounted grader/ loader	As per requirement.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – IV: T&Ps AND MME TO BE DEPLOYED BY CONTRACTOR

24.	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)	As per requirement.
25.	Dumper	As per requirement
26.	Reinforcement bending machine	04 Nos or more as per requirement
27.	Reinforcement cutting machine	04 Nos or more as per requirement
28.	MS scaffolding pipe with matching Couplers	As per requirement
29.	Plate compactor	As per requirement
30.	Earth Compactor	As per requirement
31.	Cable locator	01 No
32.	Vacuum Dewatering machine	01 Nos or more as per requirement
33.	Total Station	01 Nos or more as per requirement
34.	Auto level & staff	02 Nos or more as per requirement
35.	Vibro roller of suitable capacity	To be mobilized as per site requirement
36.	Water Tanker	As per requirement
37.	All equipments for area lighting like halogen bulbs and Portable light towers etc.	As per requirement
38.	All equipment required to install temporary MS Casing of 12 m or required length like vibro hammer & suitable capacity crane etc.	As per requirement
39.	DG Set 125 KVA	As per requirement
40.	COMPUTER with printing/photocopy & CD writing facility	As per requirement

### FIELD QUALITY LAB EQUIPMENTS AS PER LIST ENCLOSED WITH THIS TENDER DOCUMENTS

#### 4.1 MEASURING AND MONITORING DEVICES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE.

#### 4.2 COMPUTER INFRASTRUCTURE

The successful bidder(s) will have to establish computerized project management system along with one no supervisor with sufficient computer knowledge (knowledge of MS office) and the following are the minimum requirements of the system:

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – IV: T&Ps AND MME TO BE DEPLOYED BY CONTRACTOR

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- 4.2.1** The bidder will have to install 2 nos PCs (multimedia PC work station Pentium-Duo,1 GHZ or above, 320 GB HDD, 2 GB RAM, 100 MBPS LAN card of HCL/ COMPAQ/ ZENITH or equivalent make with window 8 O/S with required accessories like mouse, keyboard, UPS and required software like MS Office 2010 Professional, AutoCAD 2011, ADOBE PDF CREATOR (ver 8.0) with one no laser jet printer compatible for A4 and A3 size printing (ink/ cartridge for which to be supplied as and when required, (the consumption may be assumed as 1 cartridge per month) with power backup at places, as per instruction of BHEL for exclusive use of BHEL.
- 4.2.2** These computers/ printers along with technical supervisor (two nos) shall remain contractor's property/ownership for all legal/technical purposes; however, contractor shall be allowed to take out/release the same after completion of the site works. **Further, the computer/printer along with two nos technical supervisor shall remain/work at BHEL offices.**
- 4.2.3** The contractor's technical supervisor shall provide data / information etc in prescribed formats for periodical updating of the progress reports, Billing, daily progress report, updating of schedule pertaining to the contractor's scope of work etc.
- 4.2.4** This facility has to be provided from 1st month from LOI date till completion of site works or as decided by BHEL. If contractor fails to provide computer/ printer as per requirement, for a continuous period of fifteen days or more, BHEL shall have the right to purchase it at risk and cost of bidder.
- 4.2.5** In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to the bidder, the bidder will be reimbursed at Rs 8000.00 per month for two computers with printer facility, if the services of computer and printer are being used by BHEL.

### NOTE:

This above list is only indicative and neither exhaustive nor limiting. Quantities indicated above are only the minimum required. Contractor shall deploy all necessary T&P to meet the schedules & as prescribed by BHEL engineer and required for completion of work. In the event of non mobilisation of any T&P by the successful bidder and as a result progress of work suffered, BHEL reserves the right to deduct suitable amount from the dues of the bidder, with assigning reasons thereof.

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – V: T&Ps AND MME TO BE DEPLOYED BY BHEL ON**  
**SHARING BASIS**

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**5.1 BHEL WILL NOT PROVIDE ANY T&P's FOR THIS WORK.**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VI: TIME SCHEDULE

### 6.0 Time Schedule and Mobilization for both Package-A and Package-B:

#### 6.1 Initial Mobilization and Time Schedule:

After issuance of LOI (through email/fax/courier), Contractor shall report to the Construction Manager of BHEL at site or Project Manager of BHEL at HQ Nagpur within 15 days and make KOM (Kick of Meeting) for mobilization of manpower, T&P, Date of start of work and detailed completion program.

The contractor has to subsequently augment his resources in such a manner that the entire works are completed within the **contract period of (20) Twenty months** in a manner required by BHEL to match with the project schedule.

**Date of start (DOS) of works shall be reckoned as date of first excavation. However, the date of start may be reviewed and changed accordingly by Construction Manager/Site-in-Charge/Project Manager of BHEL with recorded reasons in the KOM (Kick of Meeting).**

#### 6.2 Contract Period and Schedule of Completion:

The entire work under the scope of this contract shall be carried out in such a manner that the following listed major milestones are achieved as per completion schedule given against each activity & fronts released for erection by other agency:

##### Schedule of Completion for Package-A:

Sl No.	Civil work of following Activity	Period from DOS
1	Absorber Foundation common for Unit#1,2&3	4 <sup>th</sup> Month
2	Foundation for Booster fans common for Unit#1,2&3	5 <sup>th</sup> Month
3	Crusher House foundation	6 <sup>th</sup> Month
4	Gypsum Dewatering building foundation	6 <sup>th</sup> Month
5	Lime Stone storage silo foundation	7 <sup>th</sup> Month
6	Ball mill building foundation	7 <sup>th</sup> Month
7	Gypsum Shed foundation	8 <sup>th</sup> Month
8	Truck Tippler – civil work completion	8 <sup>th</sup> Month
9	Raft of Chimney common for Unit#1,2&3	5 <sup>th</sup> Month
10	Raft of Chimney for Unit#5	6 <sup>th</sup> Month
11	Completion of RCC Shell of Chimney common for Unit#1,2&3	12 <sup>th</sup> Month
12	Completion of RCC Shell of Chimney Unit#5	14 <sup>th</sup> Month



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VI: TIME SCHEDULE

SI No.	Civil work of following Activity	Period from DOS
13	Completion of Erection of structural platforms and flu cans for Unit#1,2&3	13 <sup>th</sup> Month
14	Completion of Erection of structural platforms and flu cans for Unit#5	15 <sup>th</sup> Month
15	Completion of Chimney in all respect including installation of electrical items, elevator, borosilicate lining etc for Unit#1,2&3	14 <sup>th</sup> Month
16	Completion of Chimney in all respect including installation of electrical items, elevator, borosilicate lining etc for Unit#5	16 <sup>th</sup> Month
17	Completion of foundation of pipe rack and duct support pedestals	14 <sup>th</sup> Month
18	Completion of all equipment foundations including floors of Unit#1,2&3	14 <sup>th</sup> Month
19	Completion of all balance civil works in all respect including road, drains, pavements etc	20 <sup>th</sup> Month

### **Schedule of Completion for Package-B:**

SI No.	Civil work of following Activity	Period from DOS
1	Absorber Foundation for Unit#4	4 <sup>th</sup> Month
2	ACW Pump House foundation	5 <sup>th</sup> Month
3	Absorber Foundation for Unit#5&6	6 <sup>th</sup> Month
4	Foundations works of FGD Control room	6 <sup>th</sup> Month
5	Foundation for Booster fans for Unit#4	8 <sup>th</sup> Month
6	Foundation for Booster fans for Unit#5&6	10 <sup>th</sup> Month
7	Raft of Chimney for Unit#4	5 <sup>th</sup> Month
8	Raft of Chimney for Unit#6	6 <sup>th</sup> Month
9	Completion of RCC Shell of Chimney Unit#4	12 <sup>th</sup> Month
10	Completion of RCC Shell of Chimney Unit#6	14 <sup>th</sup> Month
11	Completion of Erection of structural platforms and flu can for Unit#4	13 <sup>th</sup> Month
12	Completion of Erection of structural platforms and flu can for Unit#6	15 <sup>th</sup> Month
13	Completion of Chimney in all respect including installation of electrical items, elevator, borosilicate lining etc Unit#4	14 <sup>th</sup> Month



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VI: TIME SCHEDULE

Sl No.	Civil work of following Activity	Period from DOS
14	Completion of Chimney in all respect including installation of electrical items, elevator, borosilicate lining etc Unit#6	16 <sup>th</sup> Month
15	Completion of foundation of pipe rack and duct support pedestals	16 <sup>th</sup> Month
16	Completion of all equipment foundations including floors of Unit#4	14 <sup>th</sup> Month
17	Completion of all equipment foundations including floors of Unit#5&6	16 <sup>th</sup> Month
18	Completion of all balance civil works in all respect including road, drains, pavements etc.	20 <sup>th</sup> Month

### 6.3 **PROVISION OF PENALTY IN CASE OF SLIPPAGE OF INTERMEDIATE MILESTONES:**

In case of slippage of Two Major Intermediate Milestones, mentioned as M1 & M2 hereunder, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to F-14.

#### **For Package-A:**

Milestones	Civil work of following Activity	Period of release of fronts from DOS
M1	Crusher House foundation	6 <sup>th</sup> Month
M2	Completion of RCC Shell of Chimney common for Unit#1,2&3	12 <sup>th</sup> Month

#### **For Package-B:**

Milestones	Civil work of following Activity	Period of release of fronts from DOS
M1	Foundations works of FGD Control room	6 <sup>th</sup> Month
M2	Completion of RCC Shell of Chimney Unit#4	12 <sup>th</sup> Month

**Note:** Refer clause no 14 of NIT “Annexure-04” regarding modalities against provision of penalty in case of slippage of Intermediate Milestones.

#### **Notes:**

- Common activities like Plant roads, drains, fencing, paving and other misc. works etc. shall be completed in Phase wise manner / Instruction of Engineer within the Contractual time.
- Contractor shall note that individual milestones as above shall be achieved as per schedule furnished above.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VII: TERMS OF PAYMENT

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### 7.0 **Terms of Payment:**

#### 7.1 **Progressive Payment / Final Payment:**

The payments for works under the scope of this contract shall be as per clause no 2.6; clause 2.22; clause 2.23 of General Conditions of Contract and Chapter X of Special Conditions of Contract. However, Clause No. 10.5 on RA Bill Payments, in Volume-IB, Chapter-X of SCC, is revised as under:

The payment for running bills will normally be released within 30 days of submission of running bill complete in all respects with all documents. It is the responsibility of the contractor to make his own arrangements for making timely payments towards labour wages, statutory payments, outstanding dues etc. and other dues in the meanwhile.

Few points of consideration are as below:

- 7.1.1 The measurements sheets of work done in a month shall be submitted in triplicate duly agreed/signed by BHEL Engineer. The contractor shall extend all necessary assistance for verification of measurements of works without any extra cost.
- 7.1.2 The RA bill payments are interim payments and bills shall be submitted in prescribed formats.
- 7.1.3 Recoveries on account of electricity, water, statutory deductions etc. shall be made as per terms of contract.
- 7.1.4 BHEL will release payment through **Electronic Fund Transfer (EFT)/RTGS**.
- 7.1.5 Final bill shall be submitted after completion of works and upon material reconciliation along with all prescribed formats.

#### 7.2 In order to facilitate part payment, BHEL Site Engineer at his discretion may further split the contracted rates/percentages to suit site conditions, cash flow requirements according to the progress of work as per Vol. IC - GCC clause 2.23.1 (v), however following points are to be noted:

- a) Provided no 'part' payment is recommended till 25% of work in the item rate is executed.
- b) Payment of item rate to be made in not more than three instalments, last stage payment to be not lower than 20% of the item rate.

#### 7.3 **Extra/Supplementary items of work:**

The works shall be regulated as per clause no 2.15 and clause no 2.16 of General Conditions of Contract.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

### 8.0 TAXES, DUTIES, LEVIES (Rev 13 dated 05/11/2018)

1. All taxes excluding GST, GST Cess & BOCW Cess **but including, Royalties, fees, license, deposits, commission, any State or Central Levy and other charges whatsoever, if any, shall be borne by you and shall not be payable extra.**
2. Any increase of the taxes excluding GST, GST Cess & BOCW Cess, at any stage during execution including extension of the contract shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements. Please note that since GST on output will be paid by BHEL separately as enumerated below, your quoted rates/ price should be after considering the Input Credit under GST law at your end.
3. **GST :**  
The successful bidder shall furnish proof of GST registration .GST along with Cess (as applicable) legally leviable & payable by the successful bidder as per GST Law, shall be paid by BHEL. Hence Bidder shall not include GST along with Cess (as applicable) in their quoted price.
4. GST charged in the Tax Invoice/Debit note by the contractor shall be released separately to the contractor only after contractor files the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return
5. Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred there under) wherein the 'Bill To' details will as below :-  
BHEL GSTN – As per **Annexure -1**  
NAME -- Bharat Heavy Electricals Limited  
ADDRESS – Site address
6. Bidder to immediately intimate on the day of removal of Goods (in case of any supply of goods) to BHEL along with all relevant details and a scanned copy of Tax Invoice to below email ids to enable BHEL to meet its GST related compliances :-  
Email id ---- to be intimated later on.  
  
In case of delay in submission of the abovementioned documents on the date of dispatch, BHEL may incur penalty /interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from the successful bidder, if such delay is not attributable to BHEL.
7. In case of raising any Supplementary Tax Invoice (Debit / Credit Note) Bidder shall issue the same containing all the details as referred to in Section 34 read with Rule 53.
8. Bidder shall note that in case GST credit is delayed/ denied to BHEL due to delayed / non receipt of goods and /or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from the vendor along with interest levied / leviable on BHEL, as the case may be.
9. Bidder shall upload the Invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law , GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the bidder along with interest levied / leviable on BHEL.
10. Way Bill: Successful Bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

The Bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit/ Way Bill, if required, shall be arranged by the contractor and BHEL will not supply any Road Permit/ Way Bill for this purpose.

11. **New taxes and duties:**-Any New taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period including extension, if the same is not attributable to you, shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.

Benefits and/or abolition of all existing taxes must be passed on to BHEL against new Taxes, if any, proposed to be introduced at a later date.

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 must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of the price bids. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

12. For transportation work, bidder shall declare in his quotation whether he is registered under GST, if yes, whether he intends to claim GST on forward charge basis. In absence of this declaration, BHEL will proceed further with the assumption that bidder intends not to claim GST on forward charge basis. However, in case of GST registered transporter, the amount to the extent of goods and service tax will be retained till BHEL avails the credit of GST. Further, transporter shall issue tax invoice which inter alia includes gross weight of the consignment, name of the consigner and the consignee, registration number of vehicle in which the goods are transported, details of goods transported, details of place of origin and destination, GSTIN of the person liable for paying tax whether as consigner, consignee or goods transport agency, and also containing other information as mentioned under rule 46.
13. **TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills unless exemption certificate from the appropriate authority/ authorities is furnished.**
14. **TDS under GST shall be deducted at prevailing rates on applicable value from the running bills.**
15. Refer Annexure – 2 for BOCW Act & Cess Act.

### ANNEXURE-1

#### State wise GSTIN no.s of BHEL

Sl. No	Projects under state	GSTIN
1	Andhra Pradesh	37AAACB4146P7Z8
2	Bihar	10AAACB4146P1ZU
3	Chhattisgarh	22AAACB4146P1ZP
4	Gujarat	24AAACB4146P1ZL
5	Jharkhand	20AAACB4146P5ZP
6	Madhya Pradesh	23AAACB4146P1ZN
7	Maharashtra	27AAACB4146P1ZF
8	Orissa	21AAACB4146P1ZR
9	Telangana	36AAACB4146P1ZG

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

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### **ANNEXURE-2** **BOCW Act & Cess Act**

Bidder may please note that the sub-contractor/bidder of BHEL engaging building or construction worker in connection with building or other construction work, are required to follow the procedures enumerated below:

1. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
2. It shall be sole responsibility of the contractor engaging Building Workers in connection with the building or other construction works in the capacity of employer to apply and obtain registration certificate specifying the scope of work under the relevant provisions of the Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 from the appropriate Authorities.
3. It shall be responsibility of the contractor to furnish a copy of such Registration Certificate within a period of one month from the date of commencement of Work.
4. It is responsibility of the contractor to register under the Building and other Construction Workers' Welfare Cess Act, 1996 and deposit the required Cess for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 at such rate as the Central Government may , by notification in the Official Gazette, from time to time specify. However, before registering and deposit of Cess under the Building and other Construction Workers' Welfare Cess Act, 1996, the contractor will seek written prior approval from the Construction Manager.
5. It shall be sole responsibility of the contractor as employer to get registered every Building Worker, who is between the age of 18 to 60 years of age and who has been engaged in any building or other construction work for not less than ninety days during the preceding twelve months as Beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996.
6. It shall be sole responsibility of the contractor as employer to maintain all the registers, records, notices and submit returns under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
7. It shall be sole responsibility of the contractor as employer to provide notice of poisoning or occupation notifiable diseases, to report of accident and dangerous occurrences to the concerned authorities under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the rules made thereunder and to make payment of all statutory payments & compensation under the Employees' Compensation Act, 1923.
8. It shall be the responsibility of the sub-contractor as employer to make payment/deposit of applicable cess amount on the extent of work involving building or construction workers engaged by the sub-contractor within a period of one month from the receipt of payment. It shall also be responsibility of the Contractor to furnish BHEL on monthly basis, Receipts/ Challans towards Deposit of the Cess

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

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under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder along with following statistics :

- (i) Number of Building Workers employed during preceding one month.
  - (ii) Number of Building workers registered as Beneficiary during preceding one month.
  - (iii) Disbursement of Wages made to the Building Workers for preceding wage month.
  - (iv) Remittance of Contribution of Beneficiaries made during the preceding month
9. BHEL shall reimburse the contractor the Cess amount deposited for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. However, BHEL shall not reimburse the Fee paid towards the registration of establishment, fees paid towards registration of Beneficiaries and Contribution of Beneficiaries remitted.
10. It shall be responsibility of the Building Worker engaged by the Contractor and registered as a beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 to contribute to the Fund at such rate per mensem as may be specified by the State government by notification in the Official Gazette. Where such beneficiary authorizes the contractor being his employer to deduct his contribution from his monthly wages and to remit the same, the contractor shall remit such contribution to the Building and other construction Workers' Welfare Board in such manner as may be directed by the Board , within the fifteen days from such deduction.
11. Bidders may please note that though the quoted price is exclusive of BOCW (which will be reimbursed by BHEL as per sub-clause 9 above) , however, If at any point of time during the contract period, non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder is observed, BHEL reserves the right to deduct the applicable cess (1%) on the contract value and penalty ( if any, imposed by Cess Authorities) from the payables on account of non-compliance.
12. The contractor shall declare to undertake any liability or claim arising out of employment of building workers and shall indemnify BHEL from all consequences / liabilities / penalties in case of non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## CHAPTER IX – Technical Specifications and Plot Plan

### 9.0 Following Technical Specifications shall be integral parts of this tender as Vol-I-E:

SL NO	Document
1.	Section C -Technical Specification
2.	Section D- General specification of BHEL
3.	General Layout and FGD Layouts
4.	List of Field Quality Lab Equipments
5.	Soil Data

**Note: Bore hole/soil data is provided as tender documents for general information and bidder shall have to ascertain the site condition at their own. BHEL will not be responsible for any variation in soil condition from the bore hole/ soil data provided herewith tender.**

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## CHAPTER X – Appendix

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### **Tentative Manpower Requirements:**

- (a) **Project manager – 01** with adequate experience of minimum 10Years in Industrial Foundation, Building & Structural Works, Power Plant Civil & architectural Works.
- (b) Experienced Civil Engineers – 06 heads
- (c) Experienced Foreman / Supervisors – 10 heads
- (d) Planning & Billing Engineer – 01 heads (**Min 2 heads including documentation**)
- (e) Stores, Gate Pass – 01 heads
- (f) Accounts & Administration- 02 head
- (g) Quality Control Engineer/Chemist – 01 head (**min 2 head including one supervisor**)
- (h) Safety Engineer (officer) – 01 head (**min 2 head including 1 safety supervisor**)
- (i) Surveyor – 02 heads capable to handle total station
- (j) Operator, Licensed Electrician, Mechanic - As per requirement
- (k) Experienced Carpenters & Helpers – lot for similar nature of work
- (l) Experienced Bar Benders & Helpers – lot for similar nature of work.
- (m) Security Guards (Round The Clock) – As per requirement

**10.0** Deputation of above man-power shall be jointly decided at site in line with construction schedule.

**10.1** **Engineer/ supervisor for other functions like store & purchase, material management, planning, finance, administration & liaison etc are to be provided as per site requirement and not considered above.**

**10.2** 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 deviation in this regard will not be permitted unless specific & reasonable justification is made.

**10.3** In addition to above, a well experienced qualified engineer to be designated, as 'Project Co-coordinator', shall be deployed by the contractor. Such engineer shall have adequate exposure on the job and shall remain fully involved in all planning activities, guidance etc. to contractor's own team during the complete execution period of contract.

The contractor should also submit the fitness/calibration certificate for T&Ps regularly and renew as per applicable IS standards and statutory requirements. The tools & tackles shall not be removed from site without written permission of BHEL.



# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## CHAPTER XI – BILL OF QUANTITIES AND % WEIGHTAGE OF INDIVIDUAL ITEMS FOR PACKAGE-A

**This Chapter consists of Part A & Part B of Volume II “Price bid”:**

<b><u>CONTENTS</u></b>	
Description	Remarks
<b>PART A:</b> Instructions to the Bidders	Instructions
<b>PART B:</b> % weightage for amount of individual items of Schedule of quantity	Refer Latest Chapter-XI of Vol-IA TCC (BILL OF QUANTITIES AND % WEIGHTAGE OF INDIVIDUAL ITEMS)
<b>PART C:</b> Total Lump Sum Price for entire scope of Work	This part is implanted in the E- Procurement portal entitled as “ <b>Part-C of Vol-II Price Bid</b> ”.

### **Part A: Instructions to the Bidders**

- Bidders shall quote Total Lump-sum Price for the entire scope of work for Package-A Only at the place implanted in the E-Procurement Portal titled as “Part-C of Vol-II Price Bid”.** Price mentioned elsewhere in the offer of the bidder shall be treated as Null and Void.
- BHEL has fixed the % weightages as in “Part-B” for the amount of individual items of Schedule of Quantity w.r.t. the total price of Price Bid Vol-II for Package-A.
- Based on the pre-fixed % weightages, amount of individual items shall be derived by BHEL for Package-A. This amount shall not be rounded off.
- Based on the quantities of individual item and the amount arrived in Sl No 3 above, item rate of individual items shall be derived by BHEL for Package-A. This item rate shall be rounded off up to two decimal places and shall be used to calculate the total amount of an item.
- For the convenience of bidders, BHEL has issued an Excel sheet for Calculation Purpose only with all requisite formulae as detailed above for Package-A. ***However this excel sheet shall not form part of contract document. Further, this sheet should not be uploaded at the e-Portal.***
- Bidders to note that this is an ‘**Item rate contract**’. Payment shall be made for the actual quantities of work executed at the Unit rate arrived at as per serial no 4 above.

**PART B:** % weightage for amount of individual items of Schedule of quantity w.r.t. the total price (as quoted by the bidder in “Part C of Vol-II-Price Bid”) for Package-A.

**Note:** This Chapter-XI is uploaded separately as file titled ‘**Chapter XI-BOQ and Percentage Weightage**’-2282.

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

## **E-Tender Specification No: BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-B/2283**

**Scope of Works: PACKAGE-B:** Civil and Architectural Works of Main Plant FGD Civil Works of Unit#4 (1X500MW), Unit#5 (1X500MW) & Unit#6 (1X500MW) including Civil Works of Fire Protection System, Misc. Tanks, Misc. Pump House & Sump, Pipe/ Cable Rack, Duct Supports, Road, Drains, Water Supply, Sanitation etc. Civil and Architectural Works of common facilities /Structures e.g. FGD Control Room, ACW Pump House, Road, Drains, Water Supply, Sanitation etc. Construction of (1 no of 150M height for Unit#4 & 1 no of 150M height for Unit#6 ) RCC Single Flue Chimney complete in all respect including RCC Works, Fabrication & Erection of Steel Flue Cans, Installation of Borosilicate Glass Block Lining on Inner surface of Steel Flue Can, Supply, Fabrication and Erection of Mini Shell of Titanium as per Specification, Erection of Shop Fabricated Structural Platforms, Supply & Installation of Electrical Items in conformity with the approved layout etc to complete the Chimney in all respect. at **NTPC Ramagundam TPS Stage-I & II (3x200MW + 3x500MW) FGD Package.**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>PART-A</b>	<b>MAIN CIVIL WORKS</b>		
<b>100</b>	<b>EARTH WORK</b>		
	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:		
<b>A 101</b>	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, 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.		
<b>a</b>	Depth from ground level but not exceeding 2 m	CUM	43,675
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	CUM	2,500
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	CUM	1,200
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	CUM	125
<b>e</b>	Depth exceeding 8 m but not exceeding 10 m	CUM	50
<b>f</b>	Depth exceeding 10 m but not exceeding 15 m	CUM	25
<b>103</b>	Earth work in excavation in soft rock (rock without any recovery of excavated materials in the form of hard stone/boulder) including weathered rock which can be excavated by means of crow bar, pick axe, pneumatic rock breaker attachment with excavator machine etc but does not require chiselling or blasting including setting out, levelling, dewatering (wherever required), shoring & strutting, , dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 1 Km, spreading / levelling of disposed materials etc all complete for following depths below ground level.		
<b>a</b>	Depth from ground level but not exceeding 2 m	CUM	1,835

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**E-Tender Spec No: BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282**  
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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	CUM	15,483
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	CUM	355
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	CUM	50
<b>e</b>	Depth exceeding 8 m but not exceeding 10 m	CUM	50
<b>105</b>	Earth work in excavation in hard rock requiring controlled blasting including wedging, line drilling, pre shearing etc as required, setting out, levelling, dewatering (wherever required), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, necessary licenses/statutory clearances for blasting, supply, storage & handling of blasting materials, 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.		
<b>a</b>	Depth from ground level but not exceeding 2 m	CUM	25
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	CUM	281
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	CUM	38
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	CUM	25
<b>e</b>	Depth exceeding 8 m but not exceeding 10 m	CUM	25
<b>f</b>	Depth exceeding 10 m but not exceeding 15 m	CUM	25
<b>106</b>	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.		
<b>a</b>	Depth from ground level but not exceeding 2 m	CUM	25
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	CUM	25
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	CUM	25
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	CUM	25
<b>e</b>	Depth exceeding 8 m but not exceeding 10 m	CUM	25
<b>f</b>	Depth exceeding 10 m but not exceeding 15 m	CUM	25
<b>A107</b>	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.		
<b>a</b>	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	47,059
<b>b</b>	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII)	CUM	1,605

BHEL-PSWR (VOL-I-A- TECHNICAL BID SPECIFICATION)

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>A108</b>	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 earth directly from excavation within a lead upto 1Km and compacted as specified including re-excavation of stacked earth, watering, ramming/compaction by manual/mechanical means, dressing etc all complete.for the following:		
<b>a</b>	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	448
<b>A109</b>	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.		
<b>a</b>	Carriage for stacking/ backfilling of serviceable material/ earth	CUM	22,576
<b>b</b>	Carriage for disposal of serviceable/unserviceable material/ earth	CUM	7,638
<b>A111</b>	Supplying and filling sand upto any depth under floors, around foundations, plinths, paving, passages, 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	155
<b>A112</b>	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	960
<b>A114</b>	Earth work in stripping of top soil upto a minimum depth of 0.30 m below ground level so as to exclude all debris, grass, vegetation, bushes, trees having girth upto 300mm including roots and organic materials etc for leveling and grading including dressing to specified levels & grades and compacting the graded/stripped surface by manual/mechanical means, disposal of stripped materials within a lead upto 1km etc all complete as per specification, drawing and as directed by the engineer-in-charge.	SQM	25,814
<b>200</b>	<b>CONCRETE WORKS</b>		
	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:		
<b>201</b>	Concrete of grade M7.5 (1 part cement, 4 part sand, 8 parts of 40 mm graded aggregate by volume) as mass filling course, lean concrete, levelling course, mud mat under and around foundations/ floors, at any depth below finished floor level etc.	CUM	3,235

BHEL-PSWR (VOL-I-A- TECHNICAL BID SPECIFICATION)

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
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	52
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	35
204	Concrete of grade M20 (1 part cement, 1.5 part sand, 3 parts of 20 mm graded aggregate by volume) under floors, paving, plinth protection, pipe encasing etc complete.	CUM	50
A204	Concrete of grade M20 (1 part cement, 1.5 part sand, 3 parts of 12 mm graded aggregate by volume) under floors, paving, plinth protection, pipe encasing etc complete.	CUM	29
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.		
a	M 25 Grade	CUM	19,155
b	M 30 Grade	CUM	18
c	M 35 Grade	CUM	263
206	Providing and laying Design Mix cement concrete of grade conforming to IS:456 & IS 10262-2009 for reinforced concrete works with coarse sand and graded hard stone aggregate of 20mm nominal size in superstructure at all level above 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.		
a	M25 Grade	CUM	2,218
b	M 30 Grade	CUM	23
c	M 35 Grade	CUM	70
A207	Providing and laying Design Mix cement concrete confirming to IS:456 & IS 10262-2009 for reinforced concrete works of grade mentioned below in machine foundations for TG, Gas Turbine, ID/FD/PA fans, BFP, Coal mills, Booster fans, Ball mills, etc. at all elevations below/above finished floor level except TG deck and top decks supported over vibration isolation system but including TG foundation columns with addition of suitable plasticizer conforming to IS 9103(latest) to achieve a slump more than 125mm in		

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	concrete as per manufacturer's recommendation with 20 mm nominal size graded aggregate in concrete all complete as per specification & drawing.		
<b>a</b>	M 30 Grade	CUM	2,697
<b>A209</b>	Extra over St. No. 205 to A207 for controlling of temperature of fresh concrete to less than 23 degree centigrade using ice, including all related arrangements for providing, storing and mixing of ice with water, cooling of aggregates etc. All complete as per specification, drawing and instruction of engineer in charge.	CUM	2,697
<b>A210</b>	Extra over ST Nos. 205 to A207 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	2,697
<b>211</b>	Providing and encasing of structural steel member with concrete using nominal 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)		
<b>a</b>	M20 grade	CUM	18
<b>b</b>	M25 grade	CUM	453
<b>Ac</b>	M30 grade	CUM	3
<b>212</b>	Screed concrete conforming to IS 456 with coarse sand and graded hard stone aggregate 12.5mm/6 mm nominal size on the roof at any level or thickness, drains etc complete as per following.		
<b>a</b>	1:2:4 (1 part cement, 2 part sand, 4 parts of aggregate by volume) (M15)	CUM	154
<b>b</b>	1:1.5:3 (1 part cement, 1.5 part sand, 3 parts of aggregate by volume) (M20)	CUM	5
<b>213</b>	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 precast 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.		
<b>a</b>	M 25 grade	CUM	84
<b>b</b>	M 30 grade	CUM	166
<b>214</b>	Providing and laying Design Mix cement concrete as per IS:456, IS 3370 & IS 10262-2009 for reinforced concrete works using graded aggregate for Concrete in water retaining/conveying structures including		

BHEL-PSWR (VOL-I-A- TECHNICAL BID SPECIFICATION)



# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	addition of suitable plastisizer cum waterproofing cement additives confirming to IS 9103 latest to achieve a slump more than 125 mm in concrete as per manufacturers recommendation and conforming to limits of permeability as per IS 2545 and specification with 20 mm nominal size graded aggregate for following grades. Watertightness is to be ensured including structural grouting if required.		
<b>a</b>	M 25 grade	CUM	5
<b>b</b>	M 30 grade	CUM	447
<b>215</b>	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. (Note:removal of stone soling/WBM upto 300mm thicknes if found shall be measured and paid separately under item 101a.)		
<b>a</b>	Plain cement concrete of all grades	CUM	675
<b>b</b>	Reinforced cement concrete of all grades	CUM	1,335
<b>216</b>	Chipping of concrete in reinforced concrete work, cutting pockets, making openings at all levels and according to shapes, disposal of waste materials upto a lead of 2 km as directed by engineer including equipment, safety precautions, making good the broken surface etc all complete as per specification, drawing, instructions of engineer in charge but excluding cutting of reinforcement .	CUDM	53
<b>217</b>	Extra over and above St No 216 for cutting of reinforcement, all sizes and types including labour, equipment, return of cut reinforcement to store etc all complete as per specification, drawings and instructions of engineer in charge. Measurement shall be on the cross sectional area of reinforcement cut.	SQCM	63
<b>218</b>	Cutting Reinforced concrete with mechanised tools like Core drilling machine etc. for cutting pockets, holes, cores in slab, beam, column or foundation as per direction of engineer in charge.	CUDM	13
<b>219</b>	Providing and applying curing compound (water based) of approved make where ever required as per manufacturer's specification.	SQM	25
<b>300</b>	FORM WORKS		
	FORMWORK: Providing, fixing and removing formwork at all elevations for all structures, as per specifications and including all labour, material, scaffoldings and centering etc. complete as per drawing, specifications and as per direction of engineer in charge for the following:		
<b>301</b>	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	30,697

BHEL-PSWR (VOL-I-A- TECHNICAL BID SPECIFICATION)

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
302	Fairface form work with good quality water proof ply wood of minimum 12mm thickness and smooth surface above finished ground floor level for columns, beams, suspended floors, roofs, lintels, cantilevers, staircases, landings, balconies, etc. including chamfering of edges as per drawing.for all heights as per specification, drawing and instruction of engineer in charge.	SQM	5,794
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.		
a	Upto 150 mm depth	EACH	10
b	Pockets of depths more than 150mm and upto 300 mm depth	EACH	10
c	Pockets of depths more than 300mm and upto 600 mm depth	EACH	10
d	Pockets of depths more than 600mm and upto 1000 mm depth	EACH	10
e	Pockets of depths more than 1000mm and upto 1500 mm depth	EACH	10
f	Pockets of depths more than 1500mm and upto 2000 mm depth	EACH	10
400	REINFORCEMENT		
	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:.		
401	Providing, straightening, cutting, bending, placing in position at all level, binding of mild steel reinforcements conforming to grade 1 of IS:432 part 1 in concrete including cost of reinforcement steel, binding wire, labour, scaffolding, transportation to & from stores etc. all complete as per specifications & drawings.	MT	5
A402	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. (BHEL will supply TMT free of cost as per TCC)	MT	2,618
500	WATER PROOFING WORKS		
	Roof Treatment works: Roof treatment works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, curing, sampling, testing etc at all level as per specification, drawings and as directed by engineer - in - charge for the following:		

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**E-Tender Spec No:** BHE/PW/PUR/RGFGD-MAIN-CIVIL+CHIMNEY-PKG-A/2282  
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## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
A502	Providing and laying topping plaster with cement mortar 1:4 (1 cement : 4 sand) and thickness of 25 mm including preparation of surface, batching, mixing, leveling etc. all complete.	SQM	3,230
A506	Providing and applying high solid content liquid applied Urethane based elastomeric water proofing membrane with one coat of polymerised mastic over the RCC roof to achieve smooth surface as primer with an application rate of minimum 6 sq.m per litre and two successive liquid coatings of high solids content urethane pre-polymers or equivalent material based finish coats as per relevant IS/ASTM standards (ASTM C 836 and ASTM C 898), to form an elastomeric membrane with overall dry film thickness 1.5 mm subject to minimum 500 gm/sqm/coat application rate. Item includes surface preparation, polyscrim cloth /fabric, polymerised mortar base preparation, etc all complete as per specifications and directions of engineer in charge.	SQM	3,430
A507	Providing and laying wearing course consisting of 25mm thick plain cement concrete of grade M15 (1:2:4) with graded aggregate of 12.5mm size cast in panels of maximum size 1.2mx1.2m and reinforced with 0.56 mm dia. galvanised chicken wire mesh and sealing of joints (in grooves of 6mm X 6mm) using silicone sealant /elastomeric water proofing membrane etc all complete.	SQM	3,230
510	Providing and laying cement concrete chequered flooring tiles of 22 mm thickness and size 300x300 mm conforming to IS 13801 with 8 mm thick 1:4 cement mortar over the top most layer of roofing treatment in pathway or entire area with fine joints including sealing of joints (silicon/elastomeric sealant) and providing expansion gap in both directions filled up with (silicon/elastomeric) joint sealant, underbed (as per drawings) etc all complete. (Water proofing paid elsewhere) (including cost of cement for tiles making)	SQM	1,367
A511	Providing and applying minimum two coats of bitumen grade 85/25 as per IS 702 ( @ 1.7kg/sqm) with 1% antistripping compound [for non-critical structures] conforming to IS 6241 in foundation, wall, column etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete.	SQM	29,978
513	Providing and mixing water proofing compound conforming to IS:2645 in concrete or cement mortar all complete.	KG	78
A518	Providing and applying waterproofing treatment (two component transparent polyamide cured epoxy sealer coating, having solid by volume minimum 40%± 2%, of minimum 50 micron DFT & sealer coat shall be followed with the application of epoxy phenolic coating, solid by volume minimum 63%, of minimum 400 micron DFT for the concrete surfaces of underground water retaining structure including surface preparation etc. all complete as per specification. (This coat shall be applied after an interval of minimum 24 hours from the application of primer coat by airless spray technique).	SQM	459
A519	Providing and applying waterproofing treatment with minimum 400 micron food grade epoxy coating complying to FDA title 21, Part 175.300 for the internal concrete surfaces of water retaining structure including surface preparation etc. all complete as per specification.	SQM	113

BHEL-PSWR (VOL-I-A- TECHNICAL BID SPECIFICATION)

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
A520	Providing and fixing lining on internal surfaces of sumps with replaceable chlorobuty/bromobutyl rubber lining of minimum 5 mm thickness or with vinly ester based flake glass lining of minimum 3 mm thickness etc. all complete as per specification.	SQM	359
A521	Providing and fixing acrylic based polymer modified cementitious composite coating system etc. all complete as per specification.	SQM	10
A522	Providing and fixing minimum two coats acrylic based polymer modified cementitious composite coating system including mixing of fine silica/quartz sand of 0.6 mm nominal size for better abrasion resistance and total nominal thickness of such coating shall be minimum 1.5 mm etc. all complete as per specification.	SQM	10
B522	Providing and fixing waterproofing treatment to be provided on sunken portion of all vertical and horizontal surfaces of depressed portions of false floor, toilets, W.C., kitchen, Pantry and the like consisting of : (i) Ist course of applying cement slurry @ 4.4 kg/sq.m mixed with water proofing compound conforming to IS 2645 in recommended proportions including rounding off junction of vertical and horizontal surface. (ii) IInd course of 20 mm cement plaster 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportion including rounding off junction of vertical and horizontal surface. (iii) IIIrd course of applying blown or residual bitumen applied hot at 1.7 kg. per sq.m of area. (iv) IVth course of 400 micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100 mm wide and pasted to each other with bitumen @ 1.7 kg/sq.m) etc. all complete.	SQM	33
600	JOINTS AND FILLERS		
	JOINTS AND FILLERS: Joints & fillers including all labour, material, equipment, transportation, handling etc at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
601	Supplying & installation of bitumen impregnated fibre board conforming to IS 1838 as joint filler at joints in concrete including nailing, coating of both faces with coal tar pitch/bitumin etc. all complete.		
a	12 mm wide joints.	SQM	33
b	20 mm wide joints.	SQM	33
c	25 mm wide joints	SQM	312
d	50 mm wide joints	SQM	889
603	Providing and applying polysulphide based sealant conforming to IS:12118 in joints in concrete including cleaning of joints, raking out groove, application of primer, scaffolding etc. all complete for following size grooves:		

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>a</b>	25mmX25mm	RM	70
<b>b</b>	50mmX25mm	RM	1,212
<b>604</b>	Supplying and filling in position hot applied bitumin sealing compund (Grade A) confirming to IS 1834 including cleaning, mixing, heating, pouring/injecting sealing compound in gaps in joints including application of primer etc. all complete.		
<b>a</b>	10mm X 40mm	RM	971
<b>b</b>	12mm X 25mm	RM	23
<b>c</b>	20mmX25mm	RM	1,067
<b>605</b>	Supplying and installation of commercial quality of expanded polystyrene products from reliable manufacturers as approved by the Engineer, as filler material in joints including nailing, installation as per manufacturer's recommendation etc. all complete.		
<b>Ae</b>	100 mm wide joints with polystyrene board of type-1 conforming to IS: 4671 with density 20 Kg/cum.	SQM	691
<b>606</b>	Providing and installing PVC joint sealing strips of minimum 3mm thickness and minimum width 100 mm at the construction, expansion and isolation joints from reputed manufacturers as a continuous diaphragm to contain the filler material and/ or to exclude passage of water or any other material into or out of the structure, without any longitudinal joint; and shall be procured and installed in largest practicable lengths having a minimum number of transverse joints with jointing procedure as per the manufacturer's recommendations including the material and tools required for jointing, testing, protection, etc all complete. The joints in rubber seals shall be vulcanished as needed.	RM	8
<b>607</b>	Providing and installing strong and tough alkathene sheet or equivalent of about 1 mm in thickness in isolation joints and shall be fixed by an approved adhesive compound on the cleaned surface of the already set concrete as per the manufacturer's recommendations, to cover it fully including the material and tools required for jointing, testing, protection, etc all complete.	SQM	8
<b>608</b>	Supplying and filling in position hot applied bitumin sealing compund (Grade B) confirming to IS 1834 including cleaning, mixing, heating, pouring/injecting sealing compound in gaps in joints including application of primer etc. all complete.		
<b>a</b>	10mm X 40mm	RM	5
<b>b</b>	12mm X 25mm	RM	5
<b>c</b>	20mmX25mm	RM	5
<b>609</b>	Providing and sealing of joints with premium grade silicon sealant ( Silpruf of GE silicon or approved equivalent) including cleaning of joints, raking out groove, joint filler tapes, application of primer, curing, scaffolding etc. all complete as per manufacturer's recommendation for following size groove:		
<b>a</b>	25mmX25mm	RM	5

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>b</b>	50mmX25mm	RM	5
<b>610</b>	Providing and fixing PVC water stops in joints conforming to IS 12200 & IS 15058 all complete for the following: (Bulb or Kicker type)		
<b>d</b>	230 mm wide and 6 mm thick	RM	270
<b>612</b>	Providing and applying approved fire retardant sealant in joints/openings including cleaning of joints/openings, raking out groove, application of primer, scaffolding etc. all complete.		
<b>a</b>	25mmX25mm	RM	5
<b>b</b>	50mmX25mm	RM	5
<b>613</b>	Providing and fixing G.I strips minimum 1.5mm thk and 150mm wide including fixing accessories etc. all complete.	Kg	5
<b>614</b>	Providing and fixing aluminium strips minimum 18 SWG thk and 300mm wide over expansion joints with minimum lap of 50mm length including brass / aluminium screws, rawl plugs etc. all complete.	Kg	5
<b>615</b>	Providing and fixing 300 mm wide Stainless steel strips over expansion joints with minimum lap of 50mm length including stainless steel screws, rawl plugs etc. all complete.	Kg	10
<b>700</b>	MS EMBEDMENTS		
	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:		
<b>701</b>	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 etc. all complete.	MT	2
<b>A701</b>	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	99
<b>A702</b>	Supply, Fabrication, transportation, delivery at site and erection, installation and alignment of mild steel foundation bolt assembly conforming to IS:2062 and grade 1 of IS:432 in concrete along with nuts, lock nuts (as per IS:1363, 1364 and IS:3138), washers, anchor plates, stiffner plates, protective tape, pipe sleeves, templates etc. including welding, cutting, grinding, threading, drilling etc. all complete. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, sleeves, etc. shall be coated with temporary rust preventive fluid and during execution of civil works, the dried film of coating shall be removed using organic solvents.	MT	23

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>A703</b>	Same as above items 701, A701 & 702 with BHEL supplied material free of cost including loading, transportation, unloading etc. all complete from BHEL store to plant site.		
<b>a</b>	Mild steel embedments, inserts, pipe sleeves, angle pieces, rungs of various diameters, plates of dimensions as required etc.	MT	3
<b>b</b>	Mild steel foundation bolt assembly conforming to IS:2062 and grade 1 of IS:432 in concrete along with nuts, lock nuts (as per IS:1363, 1364 and IS:3138), washers, anchor plates, stiffner plates, protective tape, pipe sleeves, templates etc.	MT	3
<b>704</b>	Supplying, fabricating, erecting and installing following items in concrete/brickwall for all kind of works, including setting material in concrete, layout, scaffolding, cutting, forming, grinding, drilling, bolting, welding, jointing, testing etc. all complete.		
<b>a</b>	MS pipes of all diameters	Kg	10
<b>b</b>	PVC pipes / conduits of all diameters	Kg	55
<b>c</b>	UPVC pipes / conduits of all diameters	Kg	50
<b>d</b>	Expansion anchor fasteners (galvanised) of HILTI make(HUD-1 Universal Fastners) or equivalent of safe tensile capacity as specified below for brick work with expansion sleeve of A6 polyamide:		
<b>i</b>	8mm Dia	EACH	1
<b>ii</b>	10mm Dia	EACH	1
<b>iii</b>	12mm Dia	EACH	1
<b>iv</b>	14mm Dia	EACH	1
<b>e</b>	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:		
<b>i</b>	HST M8	EACH	1
<b>ii</b>	HST M10	EACH	1
<b>iii</b>	HST M12	EACH	1
<b>iv</b>	HST M16	EACH	1
<b>v</b>	HST M20	EACH	1
<b>vi</b>	HST M24	EACH	1
<b>f</b>	Chemical Expansion fasteners (galvanised)of HILTI make or equivalent of safe tensile capacity as specified below for concrete work with anchoring rod,nuts,washers,chemicals all complete,etc:		
<b>i</b>	HAS-E5.8 M8	EACH	1
<b>ii</b>	HAS-E5.8 M10	EACH	1
<b>iii</b>	HAS-E5.8 M12	EACH	1
<b>iv</b>	HAS-E5.8 M16	EACH	1

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ST NO	Item Description	UNIT	QTY (PKG-B)
v	HAS-E5.8 M20	EACH	1
vi	HAS-E5.8 M24	EACH	1
706	Supply and installation of approved 25mm thick vibration damping resilient pads on/around foundation of vibrating equipment and at other locations all complete.	SQM	13
707	Providing, laying and fixing rails(52kg/rm) and guide rails in concrete for transformer, rail track including cutting of rails, joining of rails, anchoring lugs etc all complete.	MT	3
800	GROUTING		
	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:		
801	Providing & grouting with cement slurry mix of approved ratio using pressure pump for water retaining concrete structures as per approved procedure including cost of nipples/ nozzles, cement, admixture, curing, pressure pumps, slurry agitator etc. all complete. Cost shall include fixing of nipples at maximum 500 mm centre to centre spacing, cutting of nipples after completing of grouting, making good of the nipple hole with appropriate non-shrink cement paste, water tightness test etc. all complete wherever specified in the drawing.	SQM	3
802	Providing & grouting of pocket holes, pipe sleeves under base plates, machinery, pipe supporting structures etc. with mix 1:1 (1 cement :1 sand ) using non shrink admixture etc. all complete.	CUM	1
803	Providing & grouting of pocket holes, pipe sleeves and under base plate of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with mix 1:1:2 (1 cement : 1 coarse sand : 2 aggregate of 6 mm down graded stonechips ) using non shrink admixture as per specification, drawing and direction of engineer-in-charge. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor).	CUM	14
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	21
805	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 Conbextra GP-2 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	27

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
806	Providing Chemical (epoxy) injection grouting with pressure pump for water retaining concrete structures conforming to IS:6494, including fixing nozzles, cost of approved chemical, admixture, curing etc. all complete as per NTPC Specification. Payment shall be made as per the consumption of chemical grout	Kg	3
807	Providing on the outer surface of walls, frames, rafts and roof slabs coming in contact with earth, Polymer modified cementitious coating in two layers as specified and as per manufacturer's specifications shall be provided directly on the concrete surface : 50 mm thick P. C. C. ( 1 : 2 : 4 with 10 mm nominal size stone aggregates) shall be provided under the raft i.e. over the lean concrete, followed by polymer modified cementitious coating in two layers ( slurry mix application ) as per manufacturer's specification. 50 mm thick P. C. C. ( 1 : 2 : 4 ) with 10 mm nominal size stone aggregates shall then be laid over the polymer modified cementitious coating before laying the raft.	SQM	250
808	Providing Chemical Injection Grouting with Minimum, 12 mm dia (NB) threaded nozzle of suitable length over the surface and along the construction joint line in a grid pattern at a spacing not exceeding 1.5m c/c before concreting operation After the nozzles are fully set, neat cement slurry admixed with water soluble non-shrink polymer / monomer based chemical shall be injected through the net - work of nozzles with low pressure grout pumps at a pressure of about 2.0 Kg/Sqcm. Cement slurry shall be prepared by mixing cement with non-shrink polymer/monomer @ 500 gm/50 kg bag of cement and water, ensuring that Water: Cement ratio does not exceed 2 (by weight). Wetter the structure, lesser should be the water cement ratio. The property of the polymer/monomer should be such that when it is mixed with water @ 0.5% by weight of water, the viscosity of the resultant solution (water and polymer/monomer) should not be more than 1.2 centipoises. Plasticizing agent shall be added wherever required. The grouting shall be started at very low pressure and increased gradually to a required pressure. The grouting shall continue, till the hole refuses to take any further grout, even at an increased pressure. Applied pressure shall not be more than the designed strength of the concrete. After completion of grouting operation, the nozzles shall be sealed properly to the satisfaction of the Engineer	SQM	165
900	DOORS, WINDOWS, VENTILATORS, LOUVERS		
	DOORS & WINDOWS: Doors, windows, ventilators, louvers, roof ventilators, rolling shutters, partitions including all labour, material (unless otherwise specified in BOQ/contract specification), equipments, transportation, handling, preparation of working drawings etc. at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
A903	Providing, fitting and fixing factory made pre-laminated solid core flush door shutter as per IS 2202 (Part 1 & Part 2) with pressed steel door frame, 35mm thick homogenous particle board bonded with BWP type phenolformaldehyde synthetic resin, partial board core conforming to IS 3087 type I, 35x12 mm thick teakwood beading all around including preparation of working drawings. godrej or equivalent	SQM	23

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	make mortice lock with handels on both sides,approved ISI mark anodised fittings like door stopper,300mm long tower bolts,16x300mm long aldrops ,125mm long handles on both sides etc. butt hinges, sliding bolt, knobs, (all fittings shall be anodised aluminium color dyed), finish synthetic paint over primer, screws etc. all complete as per drawing, specification and instruction of engineer in charge. with commercial faces and teak wood edges. (Finish painting paid separately)		
<b>A904</b>	Providing and fixing steel doors, those shall consist of double plate flush door shutters. The door shutter shall be 45 mm thick with two outer sheets of 18 G rigidly connected with continuous vertical 20 G stiffeners at the rate of 150 mm centre to centre. Side, top and bottom edges of shutters shall be reinforced by continuous pressed steel channel with minimum 18 G. The door shall be sound deadened by filling the inside void with mineral wool. The door shall be sound deadened by filling the inside void with mineral wool. Doors shall be complete with all hardware and fixtures like tower bolts, stoppers, aldrops,of Godrej or equivalent make.	SQM	94
<b>A906</b>	Providing and fixing anodized hollow extruded aluminium doors (single or double shutter) conforming to IS:1948, IS:1949 fabricated from extruded sections of HINDALCO/JINDAL/INDAL or equivalent make having minimum 2mm wall thickness as per IS:1285, IS:733 and anodized and electro color coating of required shade as per IS 1868 ( minimum anodized coating of grade AC15 ). fixed with rawl plugs, expansion fasteners,SS screws / fixing clips necessary filling of gaps at Junctions, at top, bottom & sides with required PVC / neoprene felt for bi-metallic protection etc. Glazing shall be clear float/toughened glass of 6mm thickness including snap fit type beading, concealed screws, fixtures, Godrej or equivalent make Mortice lock with handle on both sides, etc all complete. Aluminium section shall be smooth, free of stains, straight, mitred & jointed mechanically wherever required. (Glazing shall be paid separately)	KG	114
<b>A907</b>	Providing and fixing fire proof steel doors (single or double shutter) with panic devices shall be 45mm thk flush design comprising of two outer sheets of 18 gauge steel sheets rigidly connected and reinforced inside with continuous vertical 20 gauge stiffeners, spot welded in position at not more than 150mm on centers including all fittings, vision panel of minimum 11mm thick inter layered fire resistant glass, shop painting with approved post office/signal red color fire resistant paint and mineral wool insulation (64 kg/cum density) complete and shall be fire proof as per IS:3614, TAC requirements and as per specification. Minimum ratings shall be 2 Hrs.	SQM	67
<b>908</b>	Providing and fixing steel windows/ventilator with steel sections as per IS:1038, IS:1361 & IS:7452 latest revision including all fittings, metal beadings, hold fasts, shop and final painting ,glazing etc. all complete. (Glazing shall be paid separately)		
<b>a</b>	Openable type	SQM	293
<b>b</b>	fixed type	SQM	150

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>A909</b>	Providing and fixing anodised aluminium work of INDAL, Jindal, Hindalco or other equivalent approved make for door frames, windows, ventilators, partitions, railing etc with extruded standard tubular and other sections(of minimum 2mm wall thickness) including all fittings & fixtures and accessories of approved make conforming to IS733 and IS1285, anodised and electro color dyed to required shade according to IS 1868 (minimum anodic coating of grade AC15), fixed with rawl plugs, expansion fasteners, SS screws or with fixing clips, including necessary filling of gaps at junctions, at top, bottom and sides with required PVC/neoprene felt for bi-metalic protection etc. including preperation of working drawings, aluminium cleat angle, aluminium snap-on-beading for glazing/panelling, stair case tread nosing, with all fittings and fixtures (like tower bolts, handles, door stopper with rubber shoes, 'L' drops, stays, floor springs, hydraulic door closures etc.), CP brass/stainless steel screws, providing and fixing hinges/pivots, and making provision for fixing of fitting wherever required including cost of PVC/neoprene gasket, all complete as per drawing, specification and instructions of engineer in charge (Glazing and panelling shall be paid seperately).Weight of aluminium section only shall be measured.	Kg	11,299
<b>911</b>	Providing and fixing of door closers as per specification ,of approved make & quality all complete of following type :		
<b>a</b>	Over head hydraulic door closures as per IS 3564	EACH	3
<b>b</b>	Floor mounted Hydraulic door closers as per IS 6315	EACH	3
<b>912</b>	Providing and fixing pressed steel frames fabricated from 16 gauge M.S sheet mortised, reinforced drilled and tapped for hinges and locks bolts strikes, hold fasts adjustable floor anchors, floor tiles/weather bars ,paintings etc all complete as per specifications.	Kg	858
<b>A913</b>	Providing and fixing in position rolling shutter of hot rolled double dipped galvanised steel lath section of 18 SWG tested mild steel strips at 75mm rolling centres interlocked together through their entire length and jointed together at the end by end locks mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation including wire springs, top cover, primer & shop coats of approved enamel paint etc, all complete as per IS 6248 and specification of approved make of following types: The bottom lath shall be coupled to a lock plate fabricated from 3mm thick galvanised steel plate and securely rivetted with stiffening angles.(partly coiled and lath/full lath).		
<b>b</b>	Mechanically Operated	SQM	10
<b>c</b>	Electrically & Manually operated	SQM	173
<b>915</b>	Providing, fixing and fitting of glazing of first grade class in line with IS 3548 in steel/aluminium/wooden frames, where ever required, cleaning after fixing including hardware, gaskets, clips, beadings etc. all complete.		

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>Aa</b>	6 mm thick ground glass	SQM	25
<b>Ad</b>	6 mm thick laminated glass	SQM	30
<b>Ae</b>	3mm thick Polycarbonate sheet fire retardant and ultra violet resistant with all complete as per IS 14434 and specifications.	SQM	45
<b>Ah</b>	6 mm thick clear toughened glass	SQM	975
<b>i</b>	Two nos. 6 mm thick clear toughened float glass hermetically sealed and separated by 12 mm thick air gap for thermal insulation (only single elevation area to be measured)	SQM	58
<b>e</b>	6mm thick Polycarbonate sheet multi (twin) wall fire retardant and ultra violet resistant with sealed open edges.	SQM	25
<b>916</b>	Supplying and fixing weather stripping of approved make and quality to doors as per instructions of engineer in charge and specification complete.	RM	10
<b>917</b>	Providing and fixing 12 mm thick BWP particle board, decorative veneer (prelaminated) on both sides, as panels in aluminium framed door shutter, fixed with necessary snap-on-beading etc. all complete (excluding aluminium works).	SQM	8
<b>918</b>	Providing and fixing steel louvered window with ISMC 100 frame all round including verticals with 18G pressed steel louvers, painting etc. all complete.	SQM	3
<b>919</b>	Providing and fixing 1 mm thk. MS sheet sliding shutters with frame and diagonal braces of 50X50X6 angle iron, 3 mm MS gusset plates at junction and corners, 25 mm dia pulley, 50X50X6 angle and T-iron guide at the top and bottom respectively including painting etc. all complete.	SQM	3
<b>A923</b>	Providing and fixing anodised aluminium grill (anodised transparent or dyed to required shade according to IS: 1868 with minimum anodic coating of grade AC 15) of approved design/pattern, with approved standard section and fixed to the existing window frame with C.P. brass/ stainless steel screws @ 200 mm centre to centre, including cutting the grill to proper opening size for fixing and operation of handles and fixing approved anodised aluminium standard section around the opening, all complete as per requirement and direction of Engineer-in-charge. (Only weight of grill to be measured for payment).	KG	225
<b>1000</b>	BRICKWORK		
	BRICKWORK: Brickwork masonry including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, scaffolding etc. at all levels as per specification, drawings and as directed by engineer - in - charge for the following:		
<b>1001</b>	Providing brick work in cement mortar 1:6 (1 part cement 6 parts coarse sand) in walls, chambers etc. in thickness varying from 230mm to 460mm at all depths, places and positions below plinth including raking out joints, curing, scaffolding etc. complete excluding plastering and painting.		

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### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2 (including cost of cement for brick making)	CUM	228
1002	Providing brick work in cement mortar 1:6 (1 cement 6 coarse sand) in walls, chambers etc. in thickness 230mm at all heights, places and position above plinth including raking out joints, curing, scaffolding etc complete excluding plastering and painting.		
a	Using table moulded/machine made, uniform sized fly ash lime bricks confirming to IS 12894 with minimum crushing strength of 75 kg/cm2 (including cost of cement for brick making).	CUM	1,057
A1002	Providing brick work in cement mortar 1:6 (1 cement 6 coarse sand) in walls, chambers etc. in thickness 345mm at all heights, places and position above plinth including raking out joints, curing, scaffolding etc complete excluding plastering and painting.		
d	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	CUM	125
1003	Providing brick work in cement mortar 1:4 (1 cement 4 coarse sand) in partition walls, chambers etc. in thickness 115mm at all heights, places and position above or below plinth/graded level including providing two nos. 6 mm diameter MS bars at every third layer, raking out joints, curing, scaffolding etc complete excluding plastering and painting as per specification.		
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	SQM	65
1005	Breaking of existing brick work at all levels including plastering, removing the rubbish up to a distance of 500 m including transportation, loading, unloading etc. all complete as directed by the engineer.	CUM	50
A1006	Providing and encasing of structural steel member with masonry work around flanges, webs etc. and filling the gap between steel and masonry by minimum 12mm thick mortar of 1:6 or or 1: 2: 4 concrete. Encased member shall be wrapped with galvanised chicken wire mesh of 0.9mm thickness, with 50mm lap etc. complete as per specification. (Chicken wire mesh to paid separately)	CUM	3
1007	Providing and laying 75 mm thick bed of dry brick aggregate including of excavation, disposal of surplus earth spreading of earth, ramming, watering etc. complete in all respects as directed by the engineer.	SQM	3
1008	Making openings in existing brick wall or partition wall including making good the broken edges/surface with cement mortar 1:6 etc. complete.	CUM	5
1009	Supply and placing in position mild steel wire fabric of square mesh 25 mm size and wire diameter of 2 mm for encasing of steel sections in concrete including cutting, bending, fixing etc. complete.	SQM	13
1010	Filling existing brick wall/ partition wall opening at all level including making good the broken edges/surface with cement mortar 1:6, painting, finishing to match with existing finishing,	SQM	3

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ST NO	Item Description	UNIT	QTY (PKG-B)
	scaffolding/supporting at all level, removal of debris upto a lead of 1 km including loading, unloading, transportation etc. all complete.		
<b>1011</b>	Providing and filling brick bats in soak pits all complete.	CUM	3
<b>1100</b>	DAMP PROOF COURSE		
	DAMP PROOF COURSE: Damp proof course including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, shuttering, centering, curing etc at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
<b>A1101</b>	Providing Damp Proof Course of following thickness with M20 concrete (10mm and down graded aggregate) with 2% of approved admixture of water proofing compound all complete. Two layers of hot bitumen coating 85/25 grade as per IS:702 @ 1.7Kg./sqm shall be applied one before & one after the DPC etc. all complete as per specification.		
<b>b</b>	50mm thick	SQM	258
<b>1200</b>	CEMENT MORTAR PLASTER		
	PLASTERING: Cement mortar plaster including making grooves wherever required including all labour, material (unless otherwise specified in BOQ/contract specification), scaffolding, curing etc at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
<b>A1201</b>	Providing 18mm thick plaster consisting first (base) layer of 12mm thick plaster in cement sand mortar 1:6 and second (finish) layer of 6mm thick plaster in cement sand mortar 1:4 including providing 3mmx3mm size grooves at junctions of two dissimilar materials all complete as per specification.	SQM	4,866
<b>1202</b>	Providing 12mm thick plaster inside the building/boundary wall in cement mortar 1:6 on walls finished to a smooth finish as per specification all complete.	SQM	3,842
<b>A1202</b>	Providing all external / internal RCC surfaces including RCC parapet walls shall be provided with minimum 12mm thick plaster in cement sand mortar (1:4) except walls of underground structures like cable trenches / valve pits etc.	SQM	250
<b>1203</b>	Providing 12mm thick plaster in cement mortar 1:6 on walls with rough finish all complete.	SQM	1,040
<b>1204</b>	Providing 6mm thick plaster on ceiling in cement mortar 1:4 finished to a smooth all complete.	SQM	279
<b>1205</b>	Providing 12mm thick plaster in walls, drains/culverts with a paste of neat cement @ 1kg/sqm and rubbed smooth with trowel etc. all complete.	SQM	50
<b>1207</b>	Forming groove of uniform size from 12X12 mm upto 25X15 mm in plastered surface as per approved pattern, using wooden battens nailed to the under layer, including removal of wooden battens, repair of the edges of plaster panel and finishing the groove etc. complete as per specification, drawing and the instructions of engineer in charge.	RM	5

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## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
1208	Providing and laying encasement to box type steel beams at all levels with lath plaster 50 mm nominal thickness with cement plaster (1:4) over chicken wire mesh including all labour, materials, equipment, handling, transporting, mixing, placing, leveling, curing and cleaning, finishing the exposed surfaces etc including centering and shuttering all complete as per specification, drawing and instructions of enginner in charge (chicken wire mesh to be paid separately)	SQM	5
A1210	Providing drip course in cement mortar (1:4) in parapet, chajjas, window/door heads, architectural facias, fins etc. all complete.	SQM	5
1300	FINISHES TO CONCRETE / PLASTERED SURFACES		
	FINISHES TO CONCRETE / PLASTERED SURFACES: Finishes, painting to concrete, plastered surfaces including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, surface preparation, scaffolding etc. at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
1301	Two or more coats of white wash/ colour wash as per IS 627 of approved brand and manufacture to give an even shade including a priming coat as per specifications.	SQM	25
1304	Two or more coats of acrylic distemper of approved brand and manufacture to give an even shade including a priming coat with distemper primer complete complete as per NTPC Specification.	SQM	4,815
1305	Providing and applying two or more coats of acrylic emulsion paint as per IS 5411 of approved brand, shade and manufacture to give smooth, hard, durable & glossy finish over a coat of primer over prepared plaster surface as per manufacturers guideline and complete as per NTPC Specification.	SQM	575
1306	Providing and applying 2 or more coats of acid/alkali resistant paint of approved brand and colour to floors, walls and ceiling including preparation of surface to receive paint, providing and applying bitumen primer confirming to IS 158 complete all as per manufacturer's recommendations and as approved by engineer, at all heights above or below grade level, complete as per specifications.	SQM	8
1307	Providing and applying two coats of Epoxy coating with suitable pigments of approved shade as per specification and direction of Engineer. The epoxy paint shall be a two pack material and shall be resistant to water, oil, splash, spillage & acidic environment. The epoxy paint coating shall be of minimum 150 micron thickness over epoxy primer.	SQM	8
1308	Providing and applying 2 or more coats of Chlorinated Rubber paint of approved brand and colour to floors, walls and ceiling including preparation of surface to receive paint, providing and applying chlorinated rubber zinc phosphate primer confirming to IS 158 complete all as per manufacturer's recommendations and as approved by engineer, at all heights above or below grade level, inclusive of intermediate coat of Titanium dioxide / micaceous iron oxide complete as per specifications.	SQM	280

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
1309	Two or more coats of fire resistant transparent paint (@3.5 litre per sqm per coat) as per IS 162 on all woodwork over french polish as per IS 348 or flat oil paint as per IS 1237 of approved grade and manufacture to give an even shade as per specifications. French polish payment will be made seperately.	SQM	10
1314	Providing and applying resin bonded granular textured finish, for external applications shall consist of crushed stone/quartz chips of .5 mm to 2.5 mm size and of approved natural color/shade and bonded with synthetic resins, adhesives and additives altogether in a single pack mix, applied on cured and dried plaster surface with a dry film nominal thickness of 2.5 mm. The final finish shall have UV resistance, fungus, bacterial resistance properties all complete with grooves filled with poly sulfide sealant of matching color and shade as per specification/drawing/approval of engineer in charge.	SQM	50
1316	Providing and applying 2 mm thick plaster of paris punning on walls including preparation of surface, staging, etc. to achieve a smooth even surface all complete as per specification and as directed by Engineer.	SQM	75
1317	Providing and applying 2 mm thick white cement punning on walls including preparation of surface, staging, etc to achieve a smooth even surface all complete as per specification and as directed by engineer.	SQM	240
A1317	Providing and applying 2 mm thick polymer based water resistant putty on walls in Air conditioned Area including preparation of surface, staging, etc to achieve a smooth even surface all complete as per specification and as directed by engineer.	SQM	652
1319	Providing and applying two or more coats of Acrylic based weather coat paint of approved brand and manufacture and required shade over one coat of primer after necessary cleaning/ washing, preparing the surface using coir brush/ wire brush, sand paper, including filling of cracks with putty wherever required etc. all complete to give smooth, hard, durable & glossy finish over a coat of primer over prepared plaster surface as per manufacturers guidelines. The final finished coating shall be fungus resistant, UV resistant, water repellant and extremely durable with color fastness as per specification.	SQM	25
A1319	Providing and applying two or more coats of Acrylic smooth exterior paint with silicon additives of approved brand and manufacture and required shade over suitable primer after necessary cleaning/ washing, preparing the surface using coir brush/ wire brush, sand paper, including filling of cracks with putty wherever required etc. all complete to give smooth, hard, durable & glossy finish over a coat of primer over prepared plaster surface as per manufacturers guidelines. The final finished coating shall be fungus resistant, UV resistant, water repellant and extremely durable with color fastness as per specification.	SQM	4,756
1320	Providing and applying acid alkali and oil resistant high build, solvent free, self smoothing, seamless epoxy based amine cured floor finish 150 microns over primer on C.C. flooring.	SQM	8

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>1400</b>	<b>FLOORING AND SKIRTING</b>		
	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:		
<b>A1401</b>	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 in line with specifications.(Quoted item rate shall be inclusive of providing glass joint strips)	SQM	18,094
<b>A1401a</b>	Providing and laying paving/flooring/grade slab with metallic hardener. The top surface of the paving/flooring shall be finished with 50 mm thick metallic hardener topping over RCC paving/Flooring/grade slab all complete in line with specifications. (Quoted item rate shall be inclusive of providing glass joint strips)	SQM	5,000
<b>1402</b>	Providing and laying 25 mm thick heavy duty cement concrete mix 1:2:4 (1 cement: 2 sand : 4 stone aggregates ) flooring with metallic hardener pigmented topping of 10 mm thick uniform graded treated iron particles in skirting and dado. Under layer of 15mm thick cement concrete mix 1:2:4 (1 cement: 2 sand : 4 stone aggregates 12.5 mm well graded) and top layer of 10mm 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 as per specification. (Quoted item rate shall be inclusive of providing glass joint strips).	SQM	75
<b>A1404</b>	Providing and laying 80mm thick interlocking M35 Grade concrete blocks in paving with approved colour and pattern and should be underlain by 20mm thick layer of sand followed by 200mm thick 63 mm and down aggregate with interstices filled with selected moorum/ non-expansive soil all complete as per specification.(inclusive of cost of cement for paver manufacturing).	SQM	100
<b>1406</b>	Providing and laying polished Kota stone 18mm to 20mm thk in flooring. Under bed shall average 30mm thk of 1 cement : 2 sand : 4 stone aggregates by volume and brought to proper level. The kota stone slabs/tiles laid over under bed, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with thick cement slurry @4.4kg/sqm spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM	25
<b>1412</b>	Providing and laying 18-20mm thick polished Granite stone of approved color and texture in entrance area flooring, entrance steps, Entrance area staircases. Under bed shall average 30 mm thick of 1	SQM	592

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## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
	cement : 2 sand : 4 stone aggregate by volume and brought to proper level. The granite stone slabs/tiles laid over under bed, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with adhesive chemicals for fine joint preparation and finished with pigments/chemicals of same colour as granite stone, curing, grinding, granite polishing etc. all complete.		
<b>A1416</b>	Providing and laying mirror polished vitrified ceramic tiles of size 600x600 from reputed / approved manufacturer, complete including underbed of cement mortar 1:3 minimum 18mm thick underbed for flooring and 12mm thick underbed for dado/skirting with neat cement slurry @3.3Kg/sqm , 3 mm groove joint pointed neatly with 3x4mm stainless epoxy grout SP-100 of laticrete or approved equivalent etc. all complete for following		
<b>a</b>	10mm thick mirror polished Vitrified ceramic tiles In flooring of size 600mmx600mm	SQM	475
<b>b</b>	10mm thick matt finish vitrified ceramic tiles of size 600mmx600mm	SQM	55
<b>c</b>	7 mm thick dado with Designer ceramic tiles for Toilet, Pantry / Kitchen areas of size 300mmx450mm	SQM	55
<b>d</b>	7 mm thick Heavy duty (grade-5) dust pressed ceramic tiles fo size 300mmx300mm	SQM	52
<b>A1419</b>	Providing and laying granite stone slab of 18mm thickness single piece for wash basin / sink slab /facia of black or approved colour with cutting,making corners,moulding and opening etc. all complete.	SQM	10
<b>A1421</b>	Providing and laying Heavy Duty dust pressed (grade-5) Ceramic Tiles (Matt Finish) of size 300x300mm(approved size) and 7mm thick of reputed / approved manufacturer (Kajaria,jhonson,Spartek or equivalent) of approved finish, shade and colour. The tiles shall be scratch resistance of minimum 5 on Mohr's scale and shall have a bending strength of 350 Kg./sqm,with Under bed shall average 43mm thk of 1 cement : 2 sand : 4 stone aggregates by volume and brought to proper level including cement mortar with neat cement slurry @3.3kg/sqm all complete.	SQM	50
<b>A1422</b>	Providing & fixing Acid / Alkali resistant (Chemical resistant) tiles confirming to IS:4457 in flooring/Dado and shall be laid over bitumastic lining of min.12mm thick (to be laid in layers of 6mm each). The tiles shall be applied with 6mm thick Potassium Silicate bedding mortar as per IS:4441, 4443 & 4832, 6mm thick pointing of joints of tiles with acid/alkali resistant epox/furane mortar up to a depth of 20mm and bituminastic end sealing and including preparation of surface, application of bitumen primer, curing etc. all complete as per specification. The tiles should be abrasion resistant & durable.		
<b>a</b>	12 mm thick Acid / Alkali resistant (Chemical resistant) tiles in dado	SQM	63
<b>b</b>	20 mm thick Acid / Alkali resistant (Chemical resistant) tiles in flooring	SQM	133
<b>1428</b>	Providing and laying 3mm thick antistatic PVC flooring / skirting of approved shade,as per IS:3462 and laying as per IS:5318 all complete.	SQM	66



# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
1429	Providing and fixing removable type flooring system consisting of fire resistant particle board of size 600X600X35 mm with 0.05 mm thick aluminium foil lining at bottom and with 2 mm thick anti static PVC topping including proprietary floor supporting system complete as per specification.	SQM	25
1500	ROOFING / SIDE CLADDING		
	ROOFING / SIDE CLADDING: Roofing / side cladding work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, scaffolding, laps, hooks, washers, corner pieces etc. at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
A1501	Designing, providing and fixing permanently color coated galvanised MS troughed metal sheet decking plate of approved colour over floor beams for cast-in-situ roof slab as per relevant IS code and Grade as per NTPC specification. Deck Sheet shall serve as permanent shuttering to the roof slab 150mm thick measured over crest of metal decking & shall have adequate strength to support weight of green concrete and imposed loads during construction between beams as per manufacturer's recommendations/ calculations/ test certificates for approval including fixing of plates to beams, side lapping, end lapping etc. all complete for below mentioned spans. The Sheet shall be colour coated with total coating thickness of at least 40 microns (nominal) comprising of silicon modified polyester (SMP with silicon content of 30% to 50%) paint or Super Polyester paint, of minimum 20 microns (nominal) dry film thickness (DFT) on external face over primer coat of minimum 5 microns (nominal) and minimum 10 microns (nominal) SMP or super polyester paint over primer coat of minimum 5 microns (nominal) on internal face. SMP and Super polyester paint systems shall be of industrial finish of product type 4 of AS/NZ2728, including fixing of sheet to top flange of beam with drawn arc welding of headed shear anchor studs @ 260mm c/c in the trough and stich screws between two adjacent sheets and sealing with epoxy sealant.The shear anchor studs shall confirm to type B studs specified in AWS D1.1/D1.1M or equivalent as shear connector of 19 mm dia & 100 mm length manufactured from cold drawn round steel bars confirming to ASTM A 29 of grade designation 1010 through 1020 of standard quality with either semi killed or killed welded by drawn arc stud welding through metal deck sheet. Measurement of profile sheeting shall be of the plan area of roof covered by MS trough metal decking. The SMP and polyster paint shall confirm to product type 4 as per AS/NZS 2728. Bare Metal sheet shall be chosen ANY ONE of FOUR options specified below:		
a	Span Upto 1800mm	SQM	6,674
b	Span Exceeding 1800mm and upto 2500 mm	SQM	400
i)	Bare metal thickness(BMT) of deck plate shall be minimum thickness 0.8mm (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting)with minimum trough depth of 44 mm of grade G250 as per AS1397 / grade SS255 as per ASTM A653M / grade S250GD as per EN 10326 with zinc coating to class Z275		

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
ii)	Or of minimum 0.6mm BMT (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G350 as per AS1397 / grade SS340 class 4 as per ASTM A792M / grade S350GD as per EN 10326 with zinc coating to class Z275		
iii)	Or of steel of minimum 0.6mm BMT (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G550 as per AS1397 / grade SS550 as per ASTM A792M / grade S550GD as per EN10326 with zinc coating to class Z275.		
iv)	Or of aluminium feed material of minimum bare metal thickness of 0.9 mm of aluminium alloy of Series 31000 and above as per IS 737 and IS 1254 can also be used for metal decking.		
A1503	Providing and fixing shear connectors of mild steel studs having 16mm/19mm dia and minimum 65mm/100mm projected length above roof purlin/ floor structural beams respectively. The studs should be manufactured from cold drawn round steel bars conforming to the requirement of ASTM A 29, of grade designation 1010 through 1020, of standard quality with either semi-killed or killed, welded by Drawn Arc Stud Welding through metal deck sheet.	QUINTAL	22
A1504	Designing, providing and fixing Permanent colour coated metal cladding with minimum 30mm troughed M.S. sheets (as per NTPC Spec, by taking either one of the four options mentioned below). Zinc coating if required as per item specified below shall be on both sides including fixing to supports / rails by concealed fixing system, corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing etc. all complete. The Sheet shall be colour coated with total coating thickness of at least 40 microns (nominal) comprising of silicon modified polyester (SMP with silicon content of 30% to 50%) paint or Super Polyester paint, of minimum 20 microns (nominal) dry film thickness (DFT) on external face over primer coat of minimum 5 microns (nominal) and minimum 10 microns (nominal) SMP or super polyester paint over primer coat of minimum 5 microns (nominal) on internal face. SMP and Super polyester paint systems shall be of industrial finish of product type 4 of AS/NZ2728, Side cladding sheets shall be fixed to the runner/purlins/ Brickwork using selfdrilling special coated fasteners confirming to corrosion resistant class 3 of AS3566 and tested for 1000 hours salt spray test. Spacing of Self-drilling fasteners in transverse direction (along runners/purlin/brickwork) shall be equal to the pitch of trough or 250(+/-100) mm. Lap between the sheets shall be at least 150mm in the longitudinal direction and at least one crest wide in the transverse direction which shall be properly anchored / fixed with fasteners, all complete as per NTPC Specifications. Bare Metal Sheet shall be chosen ANY ONE of FOUR options specified below :	SQM	13,685
i)	Sheet shall be of steel with minimum 0.6mm bare metal thickness (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G250 as per AS1397 / grade SS255 as per		

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	ASTM A653M / grade S250GD as per EN 10326 with zinc coating to class Z275 / aluminium-zinc alloy coating to class AZ150.		
ii)	Or of minimum 0.5mm BMT (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G350 as per AS1397 / grade SS340 class 4 as per ASTM A792M / grade S350GD as per EN 10326 with zinc coating to class Z275 / aluminium-zinc alloy coating to class AZ150		
iii)	Or of steel of minimum 0.4mm BMT (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G550 as per AS1397 / grade SS550 as per ASTM A792M / grade S550GD as per EN10326 with zinc coating to class Z275 / aluminium-zinc alloy coating to class AZ150.		
iv)	Or of aluminium feed material of minimum bare metal thickness of 0.7 mm of aluminium alloy of Series 31000 and above as per IS 737 and IS 1254.		
1511	Providing and fixing insulation of resin bonded mineral wool of 50 mm nominal thickness conforming to IS 8183 having a density of 32 kg/cum glass wool or 48 kg/cum for rock wool, for cladding/under deck insulation including application of glue and tying with lacing wire, for glass/rock wool as per manufacturer's recommendations.		
a)	For insulation in Sandwich Cladding	SQM	65
A1519	Design, supply & erection of permanent colour coated Pre-Fabricated sandwiched insulated metal cladding of approved shade and color comprising of top sheet as troughed permanently colour coated sheet & bottom sheet as plain permanently colour coated with 50mm thick insulation sandwiched between the two sheets etc all complete as per NTPC specification.Metal sheets shall be colour coated with total coating thickness of at least 40 microns (nominal) dry film thickness (DFT) comprising of Silicon Modified Polyester (SMP with silicon content of 30% to 50%) paint or Polyester paint, of minimum 20 microns (nominal) SMP or polyester paint on one side (exposed face), over minimum 5 micron (nominal) primer coat and minimum 10 micron (nominal) SMP or Polyester paint over minimum 5 micron (nominal) primer coat on other side. SMP and Super Polyester paint shall conform to product type 4 of AS/NZS 2728.The sheets shall be of approved profile and shall have such section modulus and moment of inertia per metre width that deflection of sheets is limited to span/250 under design wind pressure for two span conditions. No increase in allowable stresses under wind load condition is allowed. Special coated fastener conforming to corrosion resistant Class 3 of AS3566 and tested for 1000 hours salt spray test shall be used for fixing Pre-Fabricated Insulated Metal Sandwich Panels with the structural members below as per specification.For insulation of cladding, mineral wool conforming to IS: 8183 shall be used. The density shall be 32 or 48 kg. /cu.m for glass or rock wool respectively. The nominal thickness of insulation shall be 50mm. Bare Metal Sheet shall be chosen ANY ONE of FOUR options specified below :	SQM	440

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ST NO	Item Description	UNIT	QTY (PKG-B)
i)	Sheet shall be of steel with minimum 0.6mm bare metal thickness (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G250 as per AS1397 / grade SS255 as per ASTM A653M / grade S250GD as per EN 10326 with zinc coating to class Z275 / aluminium-zinc alloy coating to class AZ150.		
ii)	Or of minimum 0.5mm BMT (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G350 as per AS1397 / grade SS340 class 4 as per ASTM A792M / grade S350GD as per EN 10326 with zinc coating to class Z275 / aluminium-zinc alloy coating to class AZ150		
iii)	Or of steel of minimum 0.4mm BMT (i.e. excluding the thickness of galvanizing/aluminium-zinc coating and painting) of grade G550 as per AS1397 / grade SS550 as per ASTM A792M / grade S550GD as per EN10326 with zinc coating to class Z275 / aluminium-zinc alloy coating to class AZ150.		
iv)	Or of aluminium feed material of minimum bare metal thickness of 0.7 mm of aluminium alloy of Series 31000 and above as per IS 737 and IS 1254.		
<b>ISG 1520</b>	Providing & fixing permanently at all heights and elevations, troughed sheets over roof purlins/beams/side runners etc for roofing and side cladding (internal & external) including all labour, material, equipment, transportation, handling, scaffolding, laps, hooks, washers, corner pieces etc. at any level as per specification, drawings and as directed by engineer - in - charge. Quoted rate shall include cost of all labour, material, tools and plants, consumables, lead, lift etc complete. Fixing fire resistant and UV resistant polycarbonate translucent sheets of minimum 3MM thickness on roof & side cladding as per the specification and approved drawings and directions of engineer in charge	SQM	313
<b>1600</b>	FALSE CEILING		
	FALSE CEILING: False ceiling including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, suspension system etc at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
<b>A1602</b>	Providing, fixing and laying light weight mineral fibre tile false ceiling of minimum thickness 15 mm and exposed surface semi-perforated with depth of perforation as 4 mm and humid resistance of 95% RH and fire performance of class 0/1 as per BS 476 with metal suspension grid system with galvanized Tees of section 24 X 38 mm for main runners of approved colour and make as per specification including 50mm thick mineral wool insulation (density 48kg/cum) as per IS:8183 backed with 0.05 mm thick aluminium foil & 24 G x 25 mm mesh wire netting and shall be fixed to ceiling with 24 G wire ties and suitable fixing arrangements. Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures. A.C. ducts etc. suitable M.S. channel (minimum MC 75 @ 1.2m) grid shall also be provided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC	SQM	448

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ST NO	Item Description	UNIT	QTY (PKG-B)
	ducts etc. complete with cut-outs etc. The size of tiles shall be 600 X 600 mm Required MS channel shall be measured & paid extra under respective item unit rate.		
<b>A1603</b>	Providing and fixing permanently colour coated aluminium false ceiling of approved colour and Luxalon 84 C or approved equivalent with corrosion resistant aluminium alloy panels of minimum thickness 0.5mm including 50mm thick mineral wool insulation(density 48 kg/cum) conforming to IS:8183 backed with 0.05 mm thick aluminium foil & 24 G x 25 mm mesh wire netting and shall be fixed to ceiling with 24 G wire ties and suitable fixing arrangements. Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures, A.C. ducts etc all complete. Suitable M.S. channel grid with minimum MC 75 shall also be provided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC ducts etc. ( Materials for structural platform grid made up of MS Channels/ Beams / Angles shall be supplied by BHEL and shall be paid under ST No A2301)	SQM	25
<b>A1604</b>	Providing, fixing and laying permanently colour coated aluminium false ceiling of approved colour with stove enamel finish of approved make in LINEAR and SQUARE type with corrosion resistance aluminium alloys panels of minimum thickness 0.5mm including 50mm thick mineral wool insulation (as per IS:8183)backed with 0.05 mm thick aluminium foil & 24 G x 25 mm mesh wire netting and shall be fixed to ceiling with 24 G wire ties and suitable fixing arrangements.. Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures etc. Suitable M.S. channel (minimum MC 75) grid 1200 mm C/C maximum shall also be provided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC ducts etc. The work to be complete as per specifications, drawings and direction of engineer. (Structural steel works for platform for movement is separately payable under relevant items of BOQ)	SQM	25
<b>1700</b>	<b>RAIN WATER DOWN TAKE PIPES</b>		
	RAIN WATER DOWN TAKE PIPES: Rain water down take pipes at all level including all labour, material (unless otherwise specified in BOQ/contract specification), transportation, 2 coats of approved paint over one primary coat, fixtures, accessories etc as per specification, drawings and as directed by engineer - in - charge for the following:		
<b>A1704</b>	Providing and fixing galvanised MS down take pipes conforming to IS: 1239/IS: 3589 of 150 mm dia-Medium quality as per IS:1239(part-I) all complete as per specification. (Galvanising shall be as per IS: 4736. The minimum mass of zinc coating shall not be less than 400 gms/sq.m. as per IS:6745. The zinc coating shall be smooth and shall be subjected to testing as per IS: 2633, for uniformity of coating. The zinc coating shall be free from all defects as per IS: 2629. All rain water down comers shall be provided with roof drain heads and complete with shoes bends, junctions, sockets, adapters, brackets and finished with anticorrosive painting over a coat or primer. Downcomers shall be provided with 45 x 45 cm size Khurras having minimum thickness of 30 mm with M-20 concrete over PVC sheet of 1mx1mx400micron	RM	1,736

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	and finished with 12 mm thick cement sand plaster 1:3.The rainwater down comers shall be provided with suitable C.I. grating at inlet point etc. all complete as specification.		
<b>1710</b>	Providing and fixing galvanised ERW steel down take pipes of medium duty as per specification of following diameters.		
<b>c</b>	273mm OD and 4mm thick	RM	18
<b>1800</b>	MISCELLANEOUS WORKS		
	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:		
<b>A1801</b>	Providing and Filling in trenches, plinths area paving and other underground structures with graded stone aggregate of size range 63 mm and down aggregates(complying IRC specification) in layers as specified below. 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.		
<b>a)</b>	With 200 mm compacted thickness of the underbed stone soling for normal Paving	CUM	2,628
<b>b)</b>	400 mm compacted thickness of the underbed stone soling for Heavy Duty Pavement	CUM	2,500
<b>1802</b>	Supply and laying approved quality Stone aggregate 40mm size in transformer yards.	CUM	56
<b>1804</b>	Providing and fixing weep holes in Retaining wall, drains, etc consisting of 100 mm dia HDPE pipe sleeves with single side covering for the pipe mouth with galvanised welded wire fabric of 20 mm sq. opening all complete.	EACH	50
<b>1807</b>	Anti termite chemical treatment of soil with Chlorpyriphos/Lindane E.C. 20% with 1% concentration conforming to IS:8944 and as per IS 6313 all complete. (Plinth area of building at ground floor only shall be measured for payment).	SQM	190
<b>1808</b>	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 BHEL free of cost)	MT	5
<b>1809</b>	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	3

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ST NO	Item Description	UNIT	QTY (PKG-B)
1810	Construction of below ground earthing system test links as per drawing/ sketches including concreting, reinforcement, formwork, providing & fixing GI strip etc as per drawing & specification (excavation & backfilling only will be paid under applicable BOQ items.	EACH	3
1811	Construction of below ground earthing system earth electrodes as per drawing and specification. ( Excavation and backfilling only will be paid under applicable BOQ items)	EACH	3
1812	Construction of below ground earthing system - Earth connection and riser pig tails as per drawing and specification. ( Excavation and backfilling only will be paid under applicable BOQ items& steel shall be supplied by BHEL free of cost.)	EACH	3
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	3
1814	Construction of below ground earthing system test pits as per drawing/ sketches including brickwork, plaster, concreting, reinforcement, formwork, providing & fixing GI strips/pipes, GI wires, covers etc as per drawing & specification including associated earthwork.	EACH	3
1815	Providing and fixing GI rungs in concrete/brick walls having zinc coating of minimum 900 g/sqm etc. all complete.	Kg	75
1818	Fire proofing of steel structures with VERMICULITE cementious coating including supply of all materials for vermiculite materials, reinforcement mesh (3mm thick wire, 50x50 size mesh) , nuts, tie wires, weldings, suface preparation, curing, staging, compatible paintings etc. all complete.	CUM	3
1819	Supply & fixing expanded metal steel sheet conforming to IS:412. Size of mesh shall be 10mmX40mm with strands of 2.5mm width and 1mm thickness to the structural steel for facilitating fireproofing works.	SQM	5
1821	Sprinkling of water by water tanker fitted with perforated GI pipe (portable tanker minimum 3000 litre capacity) for roads and miscellaneous area within plant boundary, for dust supression and reduction of suspended material at site for day to day work, as directed by BHEL site engineer (water for this purpose shall be provided by BHEL free of cost and utilisation of machine will be in terms of Tank-hour put in actual use for water sprinkling).	TANK-HR	10
1822	Providing & filling Bentonite Powder (Sodium base) mixed with water in electronic earthing pit as per drawing & direction below ground level including all materials, transportation, labour, incidental etc all complete as per specification.	CUM	1
1823	Providing and laying cinder filling in the toilets,roads,etc complete as directed by engineer in charge.	CUM	2
1824	Disposal of scrap steel, scrap wood, broken packing crates, cable scrap, debris and other civil waste, electrical waste materials etc. from project site to a designated place within 5 KM range, with all manpower T & P etc. including loading and unloading as and when directed by BHEL.		

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ST NO	Item Description	UNIT	QTY (PKG-B)
<b>a</b>	Steel scrap / metal scrap	MT	3
<b>b</b>	Debris & Other waste materials.	CUM	3
<b>1832</b>	Providing and fixing sliding layer of bitumen paper or craft paper over the screed layer for water retaining structures to destroy the bond between the screed and the base slab concrete of the water retaining structure etc all complete.	SQM	70
<b>A1839</b>	Providing bore wells in ground with perforated/non-perforated PVC pipe of standard approved make for rain water harvesting by means of mechanical equipment including pipe, drilling inside earth, weathered rock, sandstone, shale etc. upto required depth at locations shown in drawing etc all complete. Depth of borewell shall vary from 6m to 15m. Payment shall be made cumulative diameterwise as per actual length of bore well and diameter as mentioned below.		
<b>(a)</b>	200 mm diamter	RM	3
<b>(b)</b>	300 mm diamter	RM	3
<b>A1840</b>	Supply & packing uniformly 6mm to 3mm size gravel in the bore hole surrounding the perforated PVC pipe.	Cum	3
<b>A1841</b>	Supply & packing uniformly downgraded 40mm size gravel at all depth in the pit/well dug for rain water harvesting.	Cum	3
<b>A1842</b>	Supply & packing uniformly downgraded 40mm size pebbles at all depth in the pit/well dug for rain water harvesting.	Cum	3
<b>A1843</b>	Supply & laying coarse sand layer at all depth in the pit/well dug for rain water harvesting.	Cum	3
<b>A1844</b>	Supply and fixing of bar screen of 5 mm square M. S. bar at inlet point of Rain water collecting tanks with 50 mm X 50 mm opening etc all complete	SQM	2
<b>A1845</b>	Supply & fixing 150mm dia perforated PVC pipe ISI mark 6 Kg/ cm2 with air vent at top as per the drawing & specification complete.	RM	5
<b>A1846</b>	Providing & fixing 150 dia PVC pipe ISI mark 6 Kg/cm2 as per specification.	RM	5
<b>A1847</b>	Supply & fixing Netlon jali/ PVT net in the well dug for rain water	SQM	5
<b>A1849</b>	Providing 75mm thk. bitumen-aggregate mix laid to slope consisting of compact crushed stone (12mm downgraded stone chips), screenings, fine gravel, clean coarse sand mixed in 80/100 hot bitumen (8 to 10% by volume) and rolled or compacted all complete as per specification.	SQM	308
<b>A1850</b>	Providing 50mm thick anti corrosive layer laid to required slope consisting of clean & well graded coarse sand mixed with A90 grade bitumen for softening point upto 45 degree Celcius or A65 grade bitumen for softening point above 45 degree celcius as per IS: 73 or its equivalent quality 8 to 10% by volume and rolled or compacted all complete as per specification.	SQM	308



# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>A1851</b>	Providing underground facilities survey using Ground Penetration Radar (GPR) etc. all complete as per specification and direction of Engineer-in-Charge.	SQM	0
<b>2000</b>	<b>FENCING AND GATES</b>		
	FENCING AND GATES: Fencing and gates including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
<b>2001</b>	Supplying and erecting in position 2.4 m high PVC coated gavanised chain linked fencing of minimum 8 gauge (including PVC coating ) of mesh size 75mm x 75mm. The diameter of the hot dip galvanised steel wire for chain link fencing excluding PVC coating shall not be less than 12 gauge. GI barbed wire fencing of height of 600 mm confirming to IS 298 at top of chain link fencing shall be provided with 4 strands of barbed wire hot dip galvanised wire of 12G comprising of 2 ply of wires with barbs of 16G spaced at 100mm. Cost to include for GI hook bolts, rings & washers, hot dip galvanised tension wires, 25X6 mm GI flat stretcher bar at end posts, accessories etc. all complete.	RM	174
<b>A2008</b>	Supply, fabrication and fixing of pre-cast RCC of minimum M20 grade 3M HIGH (250X200MM) FENCE POST including making arrangements for fixing of chain link fencing (covered in item no. 2001 above), painting etc. all complete as per specification. All corner posts will have two stay posts and every tenth post will have transverse stay post.	EACH	52
<b>A2009</b>	Supply, fabrication and installing in position and testing MSSTEEL Gates, joists, angles, flats, plates, pipes, welded steel wire mesh & sheets including stiffners, bracings, fabricated hinges, Aldrops with locking arrangement, tempered steel pivot, guide track Tee, bronze aluminium ball bearing arrangements, castor wheels, paintings etc. all complete as per specification.	MT	5
<b>2100</b>	<b>WATER SUPPLY</b>		
	WATER SUPPLY: Water supply work including men, material (unless otherwise specified in BOQ/contract specification), equipment etc. at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
<b>2101</b>	Providing and fixing in position tested heavy duty type chromium plated (CP) brass long neck bib cocks including sockets, union, nuts etc all complete - 15mm nominal bore.	EACH	38
<b>2102</b>	Providing and fixing in position heavy duty brass stop cock of approved quality including all specials etc all complete - 15mm nominal bore.	EACH	30
<b>2103</b>	Providing and fixing in position heavy duty brass full way valve with wheel of approved quality including all specials etc all complete for following sizes:		
<b>a</b>	25mm nominal bore.	EACH	8
<b>b</b>	50mm nominal bore.	EACH	7

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### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>2104</b>	Providing and fixing GI pipes class B medium class conforming to IS:1239 pipes shall be concealed and painted with anticorrosive paint, complete for internal works with GI sockets, unions, elbows, tees, nipples etc and clamps including cutting and making good the walls etc all complete for following sizes:		
<b>a</b>	15 mm nominal bore.	RM	128
<b>b</b>	20 mm nominal bore.	RM	78
<b>c</b>	25 mm nominal bore.	RM	63
<b>d</b>	50 mm nominal bore.	RM	15
<b>2105</b>	Providing and fixing GI pipes class B complete for external work with GI sockets, unions, elbows, tees, nipples etc including trenching & refilling, anti-corrosive paint etc all complete for following sizes:		
<b>a</b>	15 mm nominal bore.	RM	33
<b>b</b>	20 mm nominal bore.	RM	53
<b>c</b>	25 mm nominal bore.	RM	73
<b>d</b>	50 mm nominal bore.	RM	53
<b>A2106</b>	Providing and fixing wall to wall mirror of height 900mm & 6 mm thk float glass from reputed mirror manufacturer. Mirror shall be mounted with glass adjustable revolving CP brackets with CP screws etc all complete.	EACH	7
<b>A2108</b>	Providing and fixing 20 mm diameter stainless steel towel rails (600mm X 20mm) all complete.	EACH	7
<b>2110</b>	Providing and fixing stainless steel Soap holder mounted with C.P. screws etc all complete.	EACH	7
<b>2111</b>	Providing and fixing stainless steel / C.P. liquid soap dispenser. Dispenser shall be round and easily revolving with removable threaded nozzle and mounted on C.P. brackets etc all complete.	EACH	7
<b>2112</b>	Providing and fixing glazed vitreous wall mounted paper holder with suitable cover cum cutter fitted with CP screws etc. sll complete.	EACH	6
<b>2113</b>	Providing and fixing chromium plated brass shower rose 100mm dia with 15 or 20 mm inlet dia all complete.	EACH	2
<b>A2114</b>	Providing & fixing in position High density polyethylene (cylindrical/vertical) molded seamless type tank of Syntex or approved equivalent including making all necessary inlet & outlet pipes, fixture, ball cocks, valves etc all complete for following capacities. GI pipes shall be paid separately under ST No. 2105.		
<b>a</b>	500 litres capacity	EACH	8
<b>b</b>	1000 litres capacity	EACH	3
<b>2116</b>	Providing and fixing glass shelves 600mmx127mmx4 mm with chromium plated brackets all complete.	EACH	6
<b>2117</b>	Providing and fixing metal storing cabinets all complete.	EACH	6
<b>2118</b>	Providing Minimum 600 mm long porcelain tray etc all complete..	EACH	6
<b>2119</b>	Providing and fixing Recessed porcelain soap tray in shower area etc all complete.	EACH	6

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
2120	Providing and fixing grab bars, barrier-free access and appropriate fittings and fixtures for toilets for handicapped etc. all complete.	EACH	6
A2121	Providing and fixing Electric operated hand dryer with photo voltaic control including fittings, cutting and making good the wall where required etc. all complete.	EACH	6
2200	SANITARY WORKS		
	SANITARY: Sanitary work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. at all level as per specification, drawings and as directed by engineer - in - charge for the following:		
A2201	Supply and fixing glazed vitreous china Wash Basin of (oval shape) approved make (with photovoltaic control) conforming to IS:2556 part 4 of oval shape with R.S. or C.I. brackets painted white, 15mm chromium plated brass hot & cold faucets with nylon washers, chromium plated brass chain with rubber plug, 32mm chromium plated brass bottle trap and waste of standard pattern, 32mm dia chromium plated brass trap unions, plastic connection pipe with chromium plated nuts, fittings, cutting and making good the walls where required etc all complete.		
a	White	EACH	4
b	Colored	EACH	3
2202	Providing and fixing approved vitreous china laboratory sink of size 600x400x200mm conforming to IS:2556 (part-5) with R.S. or C.I. brackets, chromium plated brass chain with rubber plug 40mm, 40mm CP brass waste and 40mm CP brass trap with necessary union complete including painting the fittings, cutting and making good the wall where required etc. all complete.	EACH	1
A2203	Providing and fixing stainless steel kitchen sink of size 600x400x200mm conforming to IS: 13983 including all fittings etc. all complete.	EACH	2
A2204	Providing and fixing colour glazed vitreous china European type water closet conforming to IS:2556 with siphon, open front solid plastic seat, flush valve and plastic cover, low level 12.5 litre PVC flushing cistern (same colour as WC) with valveless fittings, necessary C.P connections etc all complete.		
b	Wall mounted	EACH	7
2205	Providing and fixing colour glazed vitreous indian type Orissa pattern (580x440mm) water closet conforming to IS:2556 part 3 with all fittings including foot rests, low level 12.5 litre PVC flushing cistern with valveless fittings, necessary C.P connections etc all complete.	EACH	2
A2206	Providing and fixing white flat back glazed vitreous china lipped urinals of size 440x265x355 mm with photo voltaic control flushing system as per IS:2556 (part 6, section 1) with flush pipes, lead pipes, gratings, traps and necessary C.P. fittings,with provision of squatting urinal for ladies toilet etc. all complete.	EACH	8

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>2207</b>	Supply, laying and jointing UPVC pipes of class 3 as per IS:4985 including bends, branches and all other necessary fittings, M.S holder bats/clamps, cutting and making good the walls and floors, jointing, testing etc all complete for following.		
<b>a</b>	75mm dia pipes	RM	10
<b>b</b>	110mm dia pipes	RM	10
<b>c</b>	160mm dia pipes	RM	10
<b>d</b>	200mm dia pipes	RM	10
<b>A2207</b>	Supply, laying and jointing CPVC pipes as per IS:15778 including bends, branches and all other necessary fittings, M.S holder bats/clamps, cutting and making good the walls and floors, jointing, testing etc all complete for following.		
<b>a</b>	75mm dia pipes	RM	525
<b>b</b>	110mm dia pipes	RM	20
<b>c</b>	160mm dia pipes	RM	20
<b>d</b>	200mm dia pipes	RM	30
<b>2208</b>	Providing, laying light duty non pressure NP3 class RCC pipes as per IS: 458 with collars jointed with stiff mixture of cement mortar 1:2 including testing of joints etc all complete for following.		
<b>a</b>	200mm dia	RM	22
<b>b</b>	300mm dia	RM	22
<b>c</b>	450mm dia	RM	22
<b>d</b>	600mm dia	RM	30
<b>e</b>	900mm Dia	RM	20
<b>2209</b>	Providing, laying light duty non pressure NP2 class RCC pipes as per IS: 458 with collars jointed with stiff mixture of cement mortar 1:2 including testing of joints etc complete for following.		
<b>a</b>	150mm dia	RM	20
<b>b</b>	250mm dia	RM	12
<b>c</b>	300mm dia	RM	12
<b>d</b>	450mm dia	RM	12
<b>e</b>	500mm dia	RM	10
<b>2210</b>	Providing, laying light duty non pressure NP4 class RCC pipes with collars jointed with stiff mixture of cement mortar 1:2 including testing of joints etc complete for following:		
<b>a</b>	450mm dia	RM	5
<b>2211</b>	Providing and fixing C.I Manhole heavy duty cover of size 600mmx450mm including frame from reputed manufacture etc. all complete.	EACH	25

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ST NO	Item Description	UNIT	QTY (PKG-B)
2212	Providing and fixing circular heavy duty C.I. manhole cover of 600 mm dia with frame etc. all complete.	EACH	15
2213	Providing and fixing square mouth S.W Gully trap grade 'A' complete with CI grating, brick masonry chamber (Clay Brickwork in 1:6 mortar, 12mm plaster in 1:6 mortar & 1:2:4 Cement Concrete) and water tight CI cover with 300x300mm (inside). The weight of cover to be not less than 4.53 Kg and frame to be not less than 2.72 Kg etc all complete for following sizes:		
a	100x100mm P or S Type.	EACH	10
b	150x100mm P or S Type.	EACH	10
c	150x150mm P or S Type.	EACH	10
2214	Providing and fixing C.I. floor traps size 100 mm Inlet and 100 mm Outlet Sand Cast Iron S&S as per IS: 1729 with C.P jalli all complete.	EACH	15
2215	Providing and fixing 100mm heavy duty UPVC floor traps with 100 mm inlet and 100 mm outlet & C.P jalli all complete.	EACH	40
2216	Providing and installing approved brand single tap water cooler of 80 L cooling capacity all complete.	EACH	15
2217	Providing and installing approved brand single tap water cooler of 150 L cooling capacity all complete.	EACH	10
2218	Providing and fixing white vitreous urinal partitions of size 675x325x85mm all complete.	EACH	15
2219	Providing and fixing eye and face drinking water fountain (combined unit with receptacle conforming to IS: 10592) all complete as per specification.	EACH	3
2221	Providing, laying spun CI pipes with conforming to IS 1536 complete for following. (Excavation, backfilling, concrete to be paid separately)		
c	150mm dia	RM	100
d	200mm dia	RM	75
f	300mm dia	RM	25
2400	ROAD WORKS		
	ROAD WORKS: Road works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation etc. as per specification drawing, relevant IRC & IS codes and as directed by the Engineer-in-charge for the following:		
2401	Preparation of sub grade by excavating earth to required depth for all types of soil/ rock, dressing to camber and consolidating the base including making good the undulation etc and disposal of surplus earth within a lead upto 1 km etc. all complete.	CUM	2,608
2402	Supplying and filling with selected good earth of approved quality in layers not exceeding 300 mm loose thickness using borrowed CNS/Morrum (borrowed soil to be arranged by the bidder) and compacted so as to achieve at least 95 % maximum dry density as per IS-2720 (Part-VII) including royalty/seignorage	CUM	423

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	fee (if any), sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, tesing etc all complete.		
<b>2403</b>	Providing, stacking & laying granular morrum for shoulder including watering, compaction with road roller to required camber etc all complete.	CUM	185
<b>2404</b>	Providing & laying water bound macadam sub base course in layers of required thickness with crushed stone aggregates 90 to 40 mm down size (IRC 19 - grading -1), stone screening & blinding material including screening, sorting, spreading to template & consolidation with road roller including carriage, spreading & consolidation of blinding material moorum etc all complete.	CUM	30
<b>2405</b>	Providing & laying water bound macadam base course in layers of required thickness with stone aggregate 63mm to 40mm size(IRC 19 - grading -1), stone screening and blinding material including screening sorting, spreading to template and consolidation with road roller including carriage, spreading and consolidation of blinding material moorum etc all complete.	CUM	1,088
<b>2406</b>	Providing & Laying water bound macadam base course with stone aggregate 50mm to 20mm size stone(IRC 19 -grading -1) screening & binding material including screening, sorting, spreading to template & consolidation with road roller including carriage spreading & consolidation of blinding material moorum etc all complete.	CUM	202
<b>2413</b>	Supplying and laying 400mmx150mmx350mm deep precast concrete kerb stone of grade M-20 with 20 mm nominal size stone aggregate and of shape as per detailed drawing including fixing with cement mortar (1:2) in 13mm thick joints, finishing of joints with neat cement paste, making drainage opening where required etc all complete.	RM	700
<b>A2414</b>	Supply and laying 200 mm dia R.C.C NP-3 type Hume pipe in raised shoulders as rain water drains as per detailed drawing including fixing with cement mortar (1:2) in 13mm thick joints, finishing of joints with neat cement paste etc all complete.	RM	45
<b>B2414</b>	Supply and laying 600 mm dia R.C.C NP-3 type Hume pipe in raised shoulders as rain water drains as per detailed drawing including fixing with cement mortar (1:2) in 13mm thick joints, finishing of joints with neat cement paste etc all complete.	RM	5
<b>A2415</b>	Supply and laying 150mm dia R.C.C NP-3 as per IS: 458 type Hume pipe in raised shoulders as rain water drains as per detailed drawing including fixing with cement mortar (1:3) in 13mm thick joints, finishing of joints with neat cement paste etc all complete. Payment terms - a) On receipt of materials at site - 50%; b) On completion of erection & fixing - 50%.	RM	440
<b>2416</b>	Dismantling of existing road consisting of premix carpet, kerb stone/ brick on edge, bitumen macadem course, WBM, prepairing subgrade to receive new WBM including camber consolidation including disposal of debris within a lead of 1 km etc all complete.	SQM	50

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### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
	CONCRETE WORKS IN ROADS:		
	Providing and placing concrete work in road 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:		
A2418	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/roads at any depth below finished floor level etc.The road base shall be with minimum 150 mm thick dry lean concrete over granular sub base. Dry lean concrete shall be laid by a mechanical paver and compacted by vibratory rollers.	CUM	553
A2419	Providing and laying (using fully mechanised paver)cement concrete of grade M35 using 20 mm nominal size stone aggregate with approved admixture (if required), provision for necessary joints including compaction, finishing to lines and grades, curing and providing & fixing forwork etc. all complete. (Excluding the cost of reinforcement and dowel bar)	CUM	680
A2420	Supplying and filling sand for preparation of road sub-base/ sub-grade 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	8
A2421	Providing & laying dry lean cement concrete of grade M15 with 20 mm nominal size graded stone aggregate over a prepared sub-grade including compaction, finishing, curing etc all complete. The road base shall be with minimum 150 mm thick dry lean concrete over granular sub base. Dry lean concrete shall be laid by a mechanical paver and compacted by vibratory rollers.	CUM	185
A2423	Providing and fixing separation Membrane of impermeable plastic sheeting of 125 microns thick laid flat without creases etc. all complete	SQM	2,000
	REINFORCEMENT IN ROADS:		
2425	Providing and fixing in position MS dowel bar reinforcement including surface painted with bitumen and greasing, dowel end caps with cotton fills etc all complete as per specification, drawing and as directed by Engineer.	MT	4
2426	Providing, straightening, cutting, bending, placing in position at any level, binding in position of steel reinforcements of TMT steel of grade Fe-500 confirming to IS:1786 including cost of binding wire, labour, scaffolding, transportation to & from stores etc all complete as per specification, drawing and as directed by Engineer.	MT	25

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
2427	Providing, straightening cutting, bending, placing in position at any level, binding in position of steel reinforcement of mild steel reinforcements including cost of binding wire, labour, scaffolding transportation to & from stores etc all complete as per specifications, drawings and as directed by Engineer.	MT	3
	MISCELLANEOUS IN ROAD WORKS:		
2428	Providing & installation of bitumen impregnated fibre board of specified thickness confirming to IS 1838 as joint filler including nailing, coating of both faces with coal tar pitch/bitumin etc. all complete as per specification, drawing and as directed by engineer.	RM	39
2429	Providing and filling in position hot applied bitumen sealing compound (Grade A) of specified thick confirming to IS 1834 including cleaning, mixing, heating, pouring/injecting sealing compound in gaps in joints, sealant primer etc all complete as per specification, drawing and as directed by Engineer.	RM	674
2430	Providing and laying debonding strip/tape of specified thickness before applying sealant including cleaning etc all complete as per specification, drawing and as directed by Engineer.	RM	8
A2431	Providing with interlocking concrete blocks of minimum M35 grade and minimum 80 mm thickness underlain by 20mm thick layer of sand(as payment separately by virtue of ST NO. 2432) followed by 200mm thick 63 mm and down aggregate with interstices filled with selected moorum/ non-expansive soil (as payment separately by virtue of ST NO. 2432). The interlocking concrete blocks shall be of approved colour and pattern as per specification, drawing and as directed by Engineer. (as payment separately by virtue of ST NO. A1801)	SQM	1,625
A2432	Providing and laying sand layer in line with NTPC specifications below concrete pavers including compaction etc all complete as per specification, drawing and as directed by Engineer.	SQM	1,133
<b>PART-B:</b>	<b>CHIMNEY WORKS</b>		
<b>SECTION-I</b>	<b>CIVIL WORKS</b>	<b>UNIT</b>	<b>QTY- PKG B (150M-2No)</b>
<b>1</b>	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 wherever required (but excluding Steel sheet piling), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead up to 1 km, spreading/levelling of disposed materials etc all complete for following depths below ground level.		
<b>a</b>	Depth from ground level but not exceeding 2 m	cum	7075
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	cum	200

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ST NO	Item Description	UNIT	QTY (PKG-B)
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	cum	50
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	cum	
<b>e</b>	Depth exceeding 8 m but not exceeding 10 m	cum	
<b>f</b>	Depth exceeding 10 m but not exceeding 15 m	cum	
<b>3</b>	Earth work in excavation in soft rock (rock without any recovery of excavated materials in the form of hard stone/boulder) including weathered rock which can be excavated by means of crow bar, pick axe, pneumatic rock breaker attachment with excavator machine etc but does not require chiselling or blasting including setting out, levelling, dewatering (wherever required), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 1 km, spreading / levelling of disposed materials etc all complete for following depths below ground level including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.		
<b>a</b>	Depth from ground level but not exceeding 2 m	cum	725
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	cum	5525
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	cum	4750
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	cum	50
<b>5</b>	Earth work in excavation in hard rock requiring controlled blasting including wedging, line drilling, pre shearing etc as required, setting out, levelling, dewatering (wherever required), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, necessary licenses/statutory clearances for blasting, supply, storage & handling of blasting materials, stacking/disposal of surplus excavated material within a lead upto 1 km, spreading / levelling of disposed materials etc all complete for following depths below ground level including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.		
<b>a</b>	Depth from ground level but not exceeding 2 m	cum	25
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	cum	25
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	cum	200
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	cum	625
<b>6</b>	Earth work in excavation in hard rock requiring chiselling including wedging, line drilling, pre shearing etc as required, setting out, levelling, deawtering (wherever required), dressing the sides & bottom, all lifts, stacking/disposal of surplus excavated material within a lead upto 1 km, spreading / levelling of disposed materials etc all complete for following depths below ground level including necessary		

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.		
<b>a</b>	Depth from ground level but not exceeding 2 m	cum	25
<b>b</b>	Depth exceeding 2 m but not exceeding 4 m	cum	25
<b>c</b>	Depth exceeding 4 m but not exceeding 6 m	cum	350
<b>d</b>	Depth exceeding 6 m but not exceeding 8 m	cum	25
<b>7</b>	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 compacted thickness using/with selected materials from compulsorily excavated soil 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 including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.		
<b>b</b>	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	13800
<b>8</b>	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 compacted thickness using/with selected materials directly from excavation and compacted as specified including watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.		
<b>b</b>	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	200
<b>9</b>	Extra over item No. 1 and 3 to 7 for carriage of excavated earth/selected materials/disposal for every 500 m or part thereof beyond an initial lead of 1 km.	cum	9300
<b>10</b>	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 compacted thickness using/with approved borrowed soil (borrowed soil to be arranged by the bidder) and compacted as specified including supplying borrowed soil, royalty (if any), watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.		
<b>b</b>	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	50
<b>11</b>	Supplying and filling sand upto any depth below grade slab, around foundations, etc. in layers not exceeding 300 mm compacted thickness and compacted so as to achieve at least 80% relative density as	cum	425

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### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
	per IS-2720 (Part-XIV) including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any) etc. all complete including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.		
12	Supplying and laying (inside chimney in the space below the grade level slab) crushed rock range 63 mm to 45 mm in layers not exceeding 200 mm in thickness including breaking of stone boulders to required sizes, filling the interstices with selected 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	1000
13	Providing and laying Nominal Mix plain cement concrete (M 7.5) with graded aggregate (with maximum size of coarse aggregate not exceeding 40 mm) at all levels for all kinds of work like mass concrete, lean concrete, mudmat, filling etc. including labour, materials, equipment, handling, transporting, batching, curing, testing etc. all complete as per specifications, drawings and instructions of the Engineer. (Cement shall be supplied by BHEL free of cost)	cum	265
14	Providing and laying design mix cement concrete with graded aggregate (maximum size of coarse aggregate not exceeding 20 mm) for reinforced concrete work at all levels for all kinds of work, including labour, materials, equipment, handling, transporting, batching, mixing, placing, levelling, compacting, curing, testing etc. and rendering or cleaning and finishing the exposed surface with cement mortar (1:3) to give smooth and even surface, all complete as per specifications, drawings and instructions of the Engineer, but excluding all formwork and reinforcing steel: (Cement shall be supplied by BHEL free of cost)		
i	For all works below ground level (except chimney shell)		
b	Grade M-30 (foundations, etc)	cum	7325
ia	Extra over St. No. 14(i) for controlling of temperature of fresh concrete for raft/pilecap to less than 23 degree centigrade using ice, including all related arrangements for providing, storing and mixing of ice with water, cooling of aggregates etc. All complete as per specification, drawing and instruction of engineer in charge.	cum	5493.75
ii	For all other works		
a	Grade M-25 grade level slab, pit, trenches, drain etc.	cum	140
b	Grade M-30 for chimney shell, corbels and external platforms and other shell attachments.	cum	195
c	Grade M-35 for chimney shell, corbels and external platforms and other shell attachments.	cum	11600

# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
15	Providing and applying three coats of bitumen grade 85/25 as per IS 702 ( @ 1.7kg/sqm) with 1% antistripping compound conforming to IS 6241 in foundation, shell, pedestal etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete.	Sqm	2500
15A	Providing brick work in cement mortar 1:6 (1 part cement 6 parts coarse sand) in walls, chambers etc. in thickness varying from 230mm to 460mm at all depths, places and positions below plinth including raking out joints, curing, scaffolding etc. complete excluding plastering and painting. Using fly ash lime bricks confirming to IS 12894 with crushing strength of 50 kg/cm2 (including cost of cement for brick making) (Cement for mortar for brickwork shall be supplied by BHEL free of cost)	cum	25
16	Providing and placing steel reinforcements of TMT steel of grade Fe-500 /Fe 500D confirming to IS:1786 and having minimum elongation 14.5% , for reinforced concrete work, at all levels, for all kinds of work, including transportation, cleaning, derusting, straightening, cutting, bending, binding in position with annealed wire and/or welding, providing concrete cover blocks, pins, separators, chairs, supports for reinforcement, etc. with all materials, labour, equipment, handling, testing, transportation to & from stores etc., preparation of bar bending schedules, all complete as per specifications, drawings and instructions of the Engineer.		
i	For all works below ground level (except chimney shell)		
a	High strength deformed bars (TMT shall be supplied by BHEL free of cost)	Mt	805.75
ii	For all other works		
a	Mild steel reinforcement bars (Supply of mild steel reinforcement is in the scope of contractor)	Mt	10
b	High strength deformed bars (TMT shall be supplied by BHEL free of cost)	Mt	1276
17	Providing and fixing formwork of approved quality for cast-in-situ, plain or reinforced concrete works of any type and section (including curved surfaces and chimney shell) for all elevations, including labour, materials, equipment, waste of forms, shoring, strutting, scaffolding, staging, tying, nailing, caulking, bolting etc. and removal of form work and staging etc. all complete as per specifications, drawings and instructions of the Engineer.		
i	For all works below ground level (except chimney shell)	Sqm	2275
ii	For all other works		
a	Inner and outer faces of wind shield with slip form shuttering	Sqm	39000

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ST NO	Item Description	UNIT	QTY (PKG-B)
<b>b</b>	All other components of the superstructure including slabs, beams, columns, walls, enclosures, mini shells, external platforms, corbels, other shell attachments, chases/recesses in shell etc.	Sqm	1025
<b>18</b>	Providing and fixing formwork in shell openings and pockets (above 0.1 sq.m surface area) including cutting, formation of shapes and all other operations required for making the required shape and size, removal of formwork, all complete as per specifications, drawings and instructions of the Engineer.	Sqm	262.5
<b>19</b>	Providing and placing in position at all levels, building paper (kraft paper), as per IS:1397, between concrete surfaces including the cost of labour, material, etc. complete as per drawings and instruction of the Engineer.	Sqm	132.5
<b>20</b>	Providing and installing, at all levels, bitumen impregnated fibre boards, 12 mm thick, conforming to IS:1838, as joint filler at joints in concrete, including nailing, coating of both faces with coal tar pitch/bitumen, including the cost of all labour, material and equipments etc., complete as per drawings, specifications and instructions of the Engineer.	Sqm	60
<b>21</b>	Providing and filling, at all levels, bitumen sealing compound (hot applied type) conforming to IS:1834, for sealing gaps and joints in concrete, including cleaning, mixing, heating, pouring or injecting, application of primer, cost of all labour, material and equipments etc., complete as per drawings, specifications and instructions of the Engineer.	Kg	867.5
<b>22</b>	Preparing detailed fabrication drawings and after approval by the Engineer, supplying, fabricating, erecting and installing miscellaneous steel parts to be embedded/cast in concrete (like staircase embedments, corbel face plates, etc) at all positions and levels including the cost of all labour, materials and equipments for setting materials in concrete, grouting, welding, bolts & bolting, expansion anchors, drilling, cutting, etc. complete as per drawings and specification. (Material supply including structural steel is in the scope of contractor)	MT	5.5
<b>B23</b>	Erection of structural steel of grade E 250 in rolled/ built up section at shop conforming to IS:2062, mild steel rounds in columns, beams, struts, monorails, stays, safety chains, ladders, MS gratings, gantry girders, roof trusses, portals, laced purlins, space frames, hangers, wall beams, sheeting runners, brackets, stiffeners, stub columns, bracings, cleats, base plates, splice plates, gussets, end plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, decking and seal plates, galleries etc including alignment, erection bolts & nuts (weight of erection bolts and nuts not payable), assembly erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, surface preparation by means of manual or mechanical power tools as per IS:1477 part 1, dismantling and removal of all temporary structures (weight of temporary structures not payable), etc all complete. (Shop fabricated steel structures shall be sprovided by BHEL Free of Cost)	MT	490

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>AB23</b>	Addition to, alterations in and/or modification of "Erection Marks" including cutting of parts, gauging of welds, cutting, grinding, fabrication, welding, drilling holes, straightening, removal of bends, raising to the required level, painting, transportation, return of unutilised steel pieces to the project store, temporarily dismantling, cutting, re-welding, supporting and restoring to correct position of all the temporarily dismantled members, realignment of adjacent connected members (weight of such temporarily dismantled and adjacent members not payable) etc all complete for the following: (Shop fabricated steel structures & Structural Steel shall be issued by BHEL Free of Cost)	Mt	
<b>a</b>	In erected position	MT	1
<b>b</b>	In fabrication yard	MT	1
<b>AAB23</b>	Touch painting of the erected structures	Sqm	25
<b>A24</b>	Transportation from BHEL store, fabrication, erection and alignment of factory made chequered plate with mild steel conforming to IS:2062 in platforms, staircases with edge binding strips and anti-skid nosing in treads etc. including 2 coats of redoxide zinc-chromate primer (one coat at shop and one coat after erection), fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete. (Chequered plates shall be issued by BHEL Free of Cost)	MT	112.5
<b>25</b>	Providing and fixing in positing of high strength structural bolts (of property class 8.8 and product grade 'C' as per IS: 1367) and conforming to IS: 3757 and high strength structural hardened and tempered nuts (of property class '8' as per IS:1367) conforming to IS:6623 with hardened and tempered washers as per IS:6649 etc. up to and inclusive of 39 mm diameter and upto 1500 mm long for structural steel work etc all complete.	Quintal	162.5
<b>26</b>	Transportaion from BHEL store, storage, fabricating and erecting at all levels, structural steel flues (liners) of grade E250 conforming to IS:2062 complete with all bends, flanges, stiffeners, all other flue attachments, support system, staying system, collars, access manholes and gas sampling ports alongwith gaskets,material and equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drillings, bending, bolts and bolting, welding, preheating and post-heating for welding, testing, etc. and other required accessories, , including connection design & preparation of fabrication drgs and appointment of a sepearate agency for review and approval of fabrication drgs in consultation with BHEL, all complete as per specifications and drawings. (Structural Steel shall be issued by BHEL as Free of Cost)	Mt	802.5
<b>26 (i)</b>	Supply & Application including blast cleaning of outer surface of steel flue to near white metal surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron and providing and applying two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT including the cost	SqM	6400

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	of all labour, material, equipments, protection of surface and cleaning, scaffolding, touch-up painting etc., complete as per drawings, specifications and instructions of the Engineer. Zinc dust composition and properties shall be Type-II as per ASTM D520-00. Primer coat shall be applied immediately after blast cleaning by airless spray technique.		
26 (ii)	Providing and applying (by airless spray technique) on outer surface of steel flue liner, an intermediate coat of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100 micron DFT after an interval of minimum 24 hours (from the application of primer coat) and of approved make including the cost of all labour, material, equipments, protection and cleaning, scaffolding, touch-up painting etc. all complete as per drawing and specifications.	SqM	6400
26 (iii)	Providing and applying on outer surface of steel flue liner, Finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT over steel sections already having intermediate coats, including the cost of all labour, material, equipments, protection and cleaning, scaffolding etc. all complete as per drawing and specifications. This coat shall be applied after an interval of minimum 24 hours (from the application of sealer coat) and within six (6) months (from the completion of Intermediate coat). Colour and shade of the coat shall be as approved by the Employer.	SqM	6400
A26	Installation of closed cell borosilicate glass block lining system at all elevations, on ground or in erected position, with minimum 38 mm thick borosilicate glass block, adhesive membrane having a minimum thickness of 3 mm and primer including blast cleaning of internal surface of steel flue liner to near white metal surface finish conforming to Sa 2 ½ finish as per ISO 8501-1, in supervision, and as directed by and satisfaction of borosilicate glass block manufacturer, testing, ten years full replacement guarantee including getting approval of design/drawings and installation procedure from BHEL/NTPC etc all complete as per specification, drawings and as directed by the Engineer-in-charge including cost of skilled labour, material, tools & tackles, equipments etc all complete. Installation of borosilicate lining shall be done under controlled temperature and humidity conditions, as mentioned in specification, including providing all equipments required to create controlled temperature & humidity conditions inside chimney during installation, hot air blow cleaning of internal surface before application etc. all complete. (Borosilicate Glass Blocks, Primer, Adhesive and onsite supervision of borosilicate glass block supplier shall be provided by BHEL Free of Cost)	SqM	6400
26F	Providing, fabricating and erecting C276 strips, plates, gutters/vanes/pipes, bends, fittings and any other appurtenances as required at all elevation in chimney for collection and withdrawal of condensate from	Kg	1975

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	inside of flue liner to outside based on the approved design in line with gas-flow-model study report, sealing, testing including surface preparation, TIG or any other type of specialised welding for C276 Strips etc all complete as per specification, drawing and as directed by the Engineer-in-charge.		
<b>27</b>	Providing, fabricating and installing at various locations and elevations of the chimney system the following miscellaneous mild steel items complete with the cost of all labour, material and equipment, transporting, lifting, setting in place, cutting, grinding, drilling, welding, bolts and bolting, anchor fasteners and anchoring, priming, painting, grouting etc. complete as per drawings and specifications: (All material supply including structural steel is in the scope of contractor)		
<b>a</b>	Mild steel ladders with cage, hood access hatch, louvers, bird screens, hood drain basin covers and other miscellaneous mild steel items not specifically mentioned.	Mt	17.5
<b>b</b>	32/40 mm nominal bore medium class tubular hand railing for stair case and internal and external platforms.	Mt	26.5
<b>c</b>	Providing minimum 275 gsm Hot dipped galvanisation on mild steel parts as per specification.	Mt	7
<b>d</b>	Providing minimum 610 gsm Hot dipped galvanisation on mild steel parts as per specification.	Mt	37
<b>29A</b>	Supplying, fabricating and installing gas sampling and gas opacity measurement ports made of C276 pipe in chimney liners, including bolts, non metallic gaskets, cover plates and any other accessories as required, painting etc, all complete as per specification, drawing and as directed by the engineer-in-charge.	kg	125
<b>30A</b>	Preparing detailed fabrication drawings after approval by the Engineer, providing, fabricating and erecting, at all levels Mini Shell at roof made of solid titanium (grade 2 as per ASME SB265) plate of minimum 8mm thk ,including all stiffeners, accessories, U-capping at top, titanium fixing arrangement with inner lining of borosilicate, titanium nut, bolts, washers, screws etc , weldables/consumables, equipment, material, surface finishing, sealing, testing for quality , etc. complete as per drawing and specifications. (BHEL will provide Titanium plate free of cost)	Mt	23.5
<b>31</b>	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and installing at all levels, stainless plates (including stainless steel screws and fasteners) of grade AISI 316Land lead sheets beams and over the mild steel in the platform beam bearing, flue supports bearings, flue restraints brackets/ buffers etc. including the cost of all labour material & equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drilling, welding of stainless steel using compatible & approved stainless steel electrodes, testing & machining flat and polishing the contact surfaces of stainless steel, coating the polished surfaces with silicone grease, etc., complete as per drawings and specifications. (Material supply including stainless steel is in the scope of contractor)		

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## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
<b>a</b>	Stainless steel components.	kg	270
<b>b</b>	Lead Sheets.	Kg	90
<b>A32</b>	Design, supply, fabrication and installation of expansion compensator joints, comprising of non-metallic material (elastomeric) suitable for wet stack operations and acid resistant to withstand acidic flue gas condensates arising out of flue gas parameters & operating conditions as per specification and shall also prevent dust accumulation, including nuts, bolts, washers, screws and any other accessories as required, preparation of detailed fabrication drawings etc all complete as per specification, drawing and as directed by the Engineer-in-charge. Design of expansion joint shall comply EPRI guideline to avoid contact of condensate with expansion joint material and to ensure drainage of condensate and the same shall be approved by BHEL/NTPC.	Sqm	90
<b>33</b>	Supply of fabricated ready to install expansion compensator in line with item no A32 as spare including nuts, bolts, washers, screws and any other accessories as required for successful installation.	Sqm	48
<b>37</b>	Supplying, and placing in position (at the beam supports bearings) Neoperne pads between concrete surface and mild steel including the cost of all labour materials, cutting to shape, grinding, drilling etc., complete as per drawings and specifications.	Cum	1
<b>42</b>	Supplying and installing ready mix castable refractory concrete at opening of chimney shell baffle wall and at other locations including all necessary arrangement for keeping them in position as per drawings and approval of Engineer.	Cum	12.5
<b>43</b>	Providing, and fixing asbestos ropes at expansion joints at all elevation for packing/sealing etc all complete as per specification, drawing and as directed by the Engineer-in-charge for the following.		
<b>b</b>	12 mm diameter	Rm	668
<b>47</b>	Supply and installation of resin bonded rock wool insulation having a density of not less than 100 kg/cu.m with an installed thickness of not less than 100 mm in two layers of each 50 mm thick including plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc, on the outer surface of steel flue liners/on the inside surface of concrete windshield/ inside surface of concrete minishells/ under the cast iron caps and wherever as required at all elevation, testing etc all complete as per specification, drawing and as directed by the Engineer-in-charge.	Sqm	400
<b>49</b>	Supply and packing/sealing of rock wool insulation with loose rock wool having a density not less than 100 kg/cu.m between the insulated minishells at expansion joints/ between the lining segments and wherever as required at all levels including filling, ramming, testing, etc. all complete as per specification, drawing and as directed by the Engineer-in-charge.	Cum	20
<b>50</b>	Providing and painting with acid and heat resisting black bituminous paint conforming to type I(i) of IS:158 in not less than 4 coats having a DFT of not less than 150 microns over inside surface of chimney	Sqm	100

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
	shell/inside and outside surfaces of minishells/underside of roof slab/ other concrete components/surfaces of the existing chimney and wherever as required etc at all elevation including surface preparation, primer etc so as to give a good finish all complete as per specification, drawing and as directed by the Engineer-in-charge.		
56	Providing and painting, at all levels, the external surfaces of chimney shell and wherever as directed by the Engineer, with acid and heat resistant polyurethane paint in alternate bands of colours 'signal red' and 'pure/bright white including the cost of all labours, material and & equipment surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specification.	Sqm	100
57	Providing and painting, with epoxy phenolic coating system in three coats having 220 microns DFT over the external surfaces of chimney shell and wherever as required at all elevation in alternate bands of 'signal red' and 'bright white' colours including surface preparation, primer etc so as to give a good finish all complete as per drawing and specification. The coating system shall be as follows. All concrete surfaces shall be provided with two component transparent polyamide cured epoxy sealer coating (having solid by volume minimum 40% $\pm$ 2%) of minimum 50 micron DFT to be applied over cleaned surface in multiple coats. Surface to be coated shall be absolutely dry, clean and dust free. Sealer coat shall be followed with the application of Intermediate coat of epoxy phenolic coating (solid by volume minimum 63%) of minimum 100 micron DFT. This coat shall be applied after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique. Intermediate coat shall be followed with the application of finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% $\pm$ 2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 $\Delta$ E) and minimum 70 micron DFT. This coat shall be applied after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the Engineer-in charge.	Sqm	18500
58	Providing and painting, with epoxy phenolic coating system in three coats having 220 microns DFT over the inside surface of chimney shell above roof/ horizontal surface of shell at top/underside of concrete roof slab and wherever as required at all elevation including surface preparation, primer etc so as to give a good finish all complete as per drawing and specification. The coating system shall be as follows. All concrete surfaces shall be provided with two component transparent polyamide cured epoxy sealer coating (having solid by volume minimum 40% $\pm$ 2%) of minimum 50 micron DFT to be applied over cleaned surface in multiple coats. Surface to be coated shall be absolutely dry, clean and dust free. Sealer coat shall be followed with the application of Intermediate coat of epoxy phenolic coating (solid by volume minimum 63%) of minimum 100 micron DFT. This coat shall be applied after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique. Intermediate coat	Sqm	500

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ST NO	Item Description	UNIT	QTY (PKG-B)
	shall be followed with the application of finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT. This coat shall be applied after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the Engineer-in charge.		
59	Proving and laying over the chimney roof, a composite acid and heat protection treatment including providing of slopes for roof drainage including the cost of all labour, material and equipment, etc., complete as required for preparing the roof concrete, laying under bed of plain cement concrete screed to slopes, preparation of screed surface for painting, painting the screed surface with black bituminous paint, applying bitumenmastic in layers, laying acid resisting(A/R) mortar bed and laying 75 mm thick acid resisting(A/R) bricks with A/R mortar, curing, pointing(with phenolic based A/R cement), protection and cleaning, finishing, etc., complete as per drawing and specifications.	Sqm	355
60	Providing, fitting& fixing, outlet and overflow, cast iron roof drain heads (with gratings) in chimney roof including sockets, adapters, brackets, hangers, supports, etc., casting-in and jointing to 150 mm nominal bore rainwater pipes, grouting, etc. including the cost of all labour material and equipement, transporting, lifting, setting in place, painting, etc. complete as per drawing and specifications.	Each	16
61	Providing, fitting and fixing rainwater pipes at all levels internally from the chimney roof to ground level upto the hood drain basin including shoes, bends, junctions, flanges,hoppers, sockets, adaptors, brackets, hangers, supports, anchor fasteners, spacers, pipe sleeve through shell, silicon or vulcanised butyl seaant, foam backing material, jointing, socketing, grouting, caulking, primer and finish painting etc. complete including the cost of all labour, material and equipment, complete as per drawing and specifications:		
a	150 mm nominal bore cast iron pipes.	Rm	64
b	150 mm nominal bore medium class galvanised mild steel pipes.	Rm	690
62	Providing and laying 50 mm thick cement concrete flooring (comprising of 12 mm thick mettalllic concrete hardener topping over 38 mm thick under bed of concrete) over the grade level slab inside the chimney, including the cost of all labour, material and equipment, etc. complete as required for preparation of base, laying underbed and topping, finishing, rounding of edges, corners and junctions, curing, testing, etc. complete as per drawing and specifications.	Sqm	570
63	Providing and installing an electrically operated semi grill type steel roll-up door (with the bottom one third of the curtain in solid type) at chimney base, in opening of approx size of 85 square m, with all hardware and mechanisms, fittings and fixtures, locking arrangements, frames, fasteners, gear handle arrangement for standby manual operation, all electrical accessories such as motors, control systems,	Each	2

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## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
	cables, etc. including the cost of all labour, material and equipment, fixing in position, grouting primer and finish painting, testing, etc., complete as per drawing and specifications.		
64	Providing and installing at any level and location, mild steel, double plate, personnel access doors, in shell openings of size 1.1m by 2.15m, complete with all fittings and fixtures, locking arrangements, frames, fasteners including the cost all labour, material and equipment, lifting to all heights, setting in place, grouting primer and finish painting, etc., complete as per drawing and specifications.	Each	2
67	Supplying, fabricating and installing mild steel hatches at various locations in the chimney system complete with locking arrangements, frames, insulation, fittings and fixtures and all mechanisms and accessories reqd. for proper operation including all labour, painting etc. complete as per drawings and specifications.		
a	Hood Access Hatch	Each	2
68	Conducting load testing on girders for 1.25 times the full load, on ground , including provision of test bed and jacks, dial gauges and other supplies complete as per specification and drawings and approval of engineer in-charge.	Pair	2
69	Designing, supplying, fabricating and installing after approval by the Engineer, non-metalic expansion joints to seal gaps between chimney components and to meet the service requirements of wet stack and as given in the specifications alongwith the cost of all components of the expansion joint, insulation, galvanised bolts, nuts, washers, anchor fasteners and retaining bars, packing materials and reinforcements at the connecting ends and flanges, lapping etc. including cost of all labour and equipment, user hand books (giving details of installation, dismantling and maintenance procedures for the expansion joints) etc. complete as per drawings and specifications for:		
a	Expansion joint between ducts and liners.	Sqm	52.5
70	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 Conbextra GP-1 or equivalent. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	Cum	0.5
71	Providing & grouting of pocket holes, pipe sleeves and under base plate of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with mix 1:1:2 (1 cement : 1 coarse sand : 2 aggregate of 6 mm down graded stonechips ) using non shrink admixture. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor).	CUM	0.5

## TECHNICAL CONDITIONS OF CONTRACT (TCC)

### CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B

ST NO	Item Description	UNIT	QTY (PKG-B)
72	Supplying and erecting after approval by Engineer a rack and pinion type Elevator of min 400 kg load carrying capacity, from ground upto top of chimney with landing at various platform level, including all fixtures and accessories complete as per spec. and drawings.	Lumpsum	2
73	Supplying, fabricating and erecting FRP Pipes with all bends, flanges, stiffeners, all other flue attachments, including support system, collars, connection with C276 pipes and any other accessories as required outside chimney flue liner at all elevation based on the approved design in line with gas-flow-model study report, including surface finishing, sealing, lamination, moulding, testing, guarantee/warranty etc. complete as per drawings, specification, manufacturer's recommendations and relevant codes.	Kg	550
<b>SECTION-II</b>	<b>ELECTRICAL WORKS</b>	<b>Unit</b>	<b>QTY- PKG B (150M-2No)</b>
1	415V, 250A, 50 KA for 1 sec, 4 wire AC Distribution Board with 1No. incomer (MCCB , 12 nos. of 100A MCCB (TPN) outgoing alongwith 100KVA lighting transformer (415/433) V in Incomer, Dyn11, Z=4%, ±2x2.5% off ckt. Tap) complete in all respects	No.	2
2	415V, 200A, 4 wire AC Emergency Lighting distribution board alongwith 50KVA lighting transformer (415/433 V, Dyn11, Z=4%, ±2x2.5% off ckt. Tap) with 2 nos. of MCCB (TPN) incomers with auto changeover facility using contactors and 8 nos. 100A MCCB (TPN) outgoing complete in all respects.	No.	2
3	Normal AC lighting panel outdoor type with degree of protection IP 55 with one no. 100A MCCB (TPN) Incomer ,		
a	18 outgoing (16A SP MCBs)	No.	4
b	12 outgoing (16A SP MCBs)	No.	2
4	Emergency lighting panel outdoor type with degree of protection IP 55 with One no. of 100A TPN/MCCB incomer and 12 outgoing (16A, SP MCBs)	No.	4
5	Aviation lighting panel outdoor type with degree of protection IP 55 with one no. 100A MCCB (TPN) Incomer , 8 outgoing 32A MCCB (TPN), photodetector and timer circuit along with 100A contactor to control Aviation lighting systems	No.	2
6	Aviation obstruction lights : High intensity Type-A flashing white light having minimum intensity of 200,000 candles . With intergral flasher & intensit control and lateched lid for easy flashtube replacemnet. The same shall have three auto switched intensities-day/twilight and night.	No.	24
7	Following type of fixtures will be used: a) 70W LED well glass fixture (for platforms) b) 30W LED Energy efficient lamp fixture (for staircase)	No. No.	40 128

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ST NO	Item Description	UNIT	QTY (PKG-B)
	c) 120W Street light type fixture ( for area illumination, illumination at 0.0 level etc.)	No.	10
8	63Amp welding switch socket with plug & other Mounting accessories	No.	8
9	3 pin, 1 ph, 240V,15Amp. Power socketscomplete with plug Switches etc.	No.	16
10	Al conductor, XLPE insulated, Armoured, , PVC outer sheath, FRLS type 1100V grade conforming to IS-7098 Part I.	Meters	
	a. 3½ C x95mm <sup>2</sup> AL XLPE for connection between ACDB/ELDB/ welding sockets	Meters	2000
	b. 3½ Cx35mm <sup>2</sup> Al XLPE for Lighting panel incoming supply	Meters	1600
	c. 4Cx16mm <sup>2</sup> AL conductor, XLPE insulated, for Incoming supply to Aviation Distribution Board	Meters	2000
12	Control cables shall have stranded annealed tinned copper conductor, 1100V grade HR PVC insulation, extruded PVC inner sheath, galvanized steel wire armoured, overall extruded PVC sheath, FRLS type		
	a) 4CX2.5 mm <sup>2</sup>	Meters	1000
13	PVC insulated 650/1100V grade stranded Cu Conductor lighting wires conforming to IS-694.	Meters	
	a. From Lighting panels to junction boxes : 4 SQ.mm	Meters	8000
	b. From junction boxes to lighting fixtures (Number of wires per lead as required) : 2.5 SQ.mm	Meters	4000
	c. From Lighting panels to receptacles (15A) : 4 SQ.mm	Meters	2000
15	GI conduit 32mm dia with junction Boxes,Pull boxes & accessories	Meters	8000
16	Electro galvanise felxible steel conduit 32 mm dia with accessories	Meters	300
17	Lightning protection Air terminal 20mm dia solid copper rod with top with lead coating and will have spikes on solid sphere on top.	Meters	36
18	50X6 around the top of each of the flue duct, for a coronal band of lead coated copper strip of size	Meters	300
19	Earthing materials		
	i) 50 mm x 6 mm GI Flat	Meters	2000
	ii) 25 mm x 6 mm GI Flat	Meters	100
	iii) 25 mm x 3 mm GI Flat	Meters	400
	iv) 8 SWG GI wire	Meters	8000
	TEST LINK BOX 200X200X100MM	No.	8
19A	40mm dia MS rod for earthing of down conductor (BHEL will provide earthing rod free of cost)	Meters	200
19B	Earthpit with earthing electrode including brick chamber with cover, accessories etc complete in all respect.	No	6
20	Telephone Socket with junction box	No.	8

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# **TECHNICAL CONDITIONS OF CONTRACT (TCC)** **CHAPTER XII – BILL OF QUANTITIES FOR PACKAGE-B**

ST NO	Item Description	UNIT	QTY (PKG-B)
21	Telephone cable shall be of minimum 0.6 mm dia annealed high conductivity electro copper conductor. PVC insulated, twisted , PVC tape wrapped, screened, tip corded, PVC sheathed, conforming to relevent ITD ( Indian telephone department) specification.		
	20 Pair	Meters	700
	2 Pair	Meters	200
22	TELEPHONE SET	No.	8
23	20 PAIR CROWN TYPE JUNCTION BOX	No.	8
24	GS cable trays. Cable trays shall be of ladder type constructed of minimum 2 mm thick mild steel hot dip galvanised.		
	600 mm wide	Meter	200
	300 mm wide	Meter	200
	150 mm wide	Meter	600
25	Aviation distribution board (ADB) with one 32A MCCB(TPN) incomer and 6 nos. SP 20A MCB. Construction is same as LP	No.	6
26	A list of Mandatory Spares parts for Aviation Obstruction Lighting System is described below for all Chimneys		
i)	Power Supply Card	nos.	0
ii)	Electronic Flasher Card	nos	0
iii)	Photocell Control Unit - 3 sets	Sets	0
iv)	Spare lamp/tube with holder for Aviation Obstruction Lighting fixture	nos.	0