

# TENDER SPECIFICATION

SI No	Tender Specification Number	Unit Number & Project
1	BHE/PW/PUR/LRPT-ESP U # 1/1260	800 MW ESP of Unit 1
2	BHE/PW/PUR/LRPT-ESP U # 2/1261	800 MW ESP of Unit 2

COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE

FOR

2X800 MW NTPC LARA

AT

VILLAGE-LARA, DISTRICT-RAIGARH CHHATISGARH

**VOLUME – I-TECHNICAL BID SPECIFICATION**

**CONSISTING OF:**

- **Notice Inviting Tender,**
- **Volume-IA : Technical Conditions of Contract-,**
- **Volume-IB : Special conditions of Contract,**
- **Volume-IC : General conditions of Contract**
- **Volume-ID : Forms & Procedures**



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

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## Tender Specification Issue Details

SI No	Tender Specification Number	Unit Number & Project
1	BHE/PW/PUR/LRPT-ESP U # 1/1260	800 MW ESP of Unit 1
2	BHE/PW/PUR/LRPT-ESP U # 2/1261	800 MW ESP of Unit 2

COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, **ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING** & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF **ESP PACKAGE FOR 2X800 MW NTPC LARA**

AT

VILLAGE-LARA, DISTRICT-RAIGARH CHHATISGARH

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:

1260  
&  
1261

# NOTICE INVITING TENDER

Bharat Heavy Electricals Limited



**NOTICE INVITING TENDER (NIT)**  
**NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES  
OR  
PURCHASE TENDERS FROM THIS OFFICE ALSO**

To

Dear Sir/Madam

**Sub : NOTICE INVITING TENDER**

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

**1.0 Salient Features of NIT**

SL NO	ISSUE	DESCRIPTION
i	TENDER NUMBER	<b>BHE/PW/PUR/LRPT - ESP U#1/1260 (For Unit # 1 ESP)</b> <b>BHE/PW/PUR/LRPT - ESP U#2/1261 (For Unit # 2 ESP)</b>
ii	Broad Scope of job	COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE FOR UNIT # 1 & UNIT # 2 AT 2X800 MW NTPC LARA AT VLLAGE-LARA, DISTRICT-RAIGARH CHHATISGARH.  <b>(Unit 1 &amp; Unit 2 shall be awarded to 2 separate agencies)</b>
iii	<b>DETAILS OF TENDER DOCUMENT</b>	
a	Volume-IA	<i>Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc</i> <span style="float: right;">Applicable</span>
b	Volume-IB	<i>Special Conditions of Contract (SCC)</i> <span style="float: right;">Applicable</span>
c	Volume-IC	<i>General Conditions of Contract (GCC)</i> <span style="float: right;">Applicable</span>
d	Volume-ID	<i>Forms and Procedures</i>
e	Volume-II	<i>Price Schedule (Absolute value).</i> <span style="float: right;">Applicable</span>
iv	Issue of Tender Documents	<ol style="list-style-type: none"> <li><b><u>Sale from BHEL PS Regional office at :</u></b> <b>Start : 20/04/2014 ,</b> <b>Closes: 09/05/2014 , Time : 16.00 Hrs</b></li> <li><b>From BHEL website (<a href="http://www.bhel.com">www.bhel.com</a>)</b> Tender documents will be available for downloading from website till due date of submission</li> </ol> <span style="float: right;">Applicable/ Not applicable</span>
v	DUE DATE & TIME OF OFFER	<b>Date : 12/05/2014, Time 15.00 Hrs</b> <b>Place : <u>BHEL PS Regional office at :Nagpur</u></b> <span style="float: right;">Applicable</span>

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	<b>SUBMISSION</b>	Tenders being submitted through representative shall be submitted at dispatch section of PSWR HQ Office after making entry/registration at the reception. For any assistance on the matter kindly contact following officials: <ul style="list-style-type: none"> <li>• Pratih Gee Varghese/Sr Engineer(Purchase</li> <li>• Shivkesh Meena / Engineer (Purchase)</li> </ul>	
vi	<b>OPENING OF TENDER</b>	<b>1 hours after the latest due date and time of Offer submission</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) Bidder may depute representative to witness the opening of tender	Applicable
vii	<b>EMD AMOUNT</b>	Rs 2,00,000/- (Rupees Two Lakhs Only)	Applicable
viii	<b>COST OF TENDER</b>	Rs 2000/-.	Applicable
ix	<b>LAST DATE FOR SEEKING CLARIFICATION</b>	Five 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	<b>SCHEDULE OF Pre Bid Discussion (PBD)</b>	Date :	Not applicable.
xi	<b>INTEGRITY PACT &amp; DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)</b>	<b>Being appointed; will be advised separately</b>	Applicable
xii	<b>Latest updates</b>	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 Corrigendums) <b>and not in the newspapers</b> . Bidders to keep themselves updated with all such information	

- 2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped 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; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at Nagpur, Sundays and second/ last Saturdays
- 4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Nagpur. For other details and for 'One Time EMD' please refer General Conditions of Contract.

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5.0 **Procedure for Submission of Tenders:** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:

- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
- PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)
- One set of tender documents shall be retained by the bidder for their reference

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. **(All pages to be signed and stamped)**

Sl no	Description	Remarks
	<b>Part-I A</b>	
	<b>ENVELOPE – I superscribed as :</b> PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:  <b>CONTAINING THE FOLLOWING:-</b>	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	Duly filled-in 'No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above.  <b>Note:</b> <ol style="list-style-type: none"> <li>a. In case of any deviation, the same should be submitted separately for technical &amp; commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. 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 all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph 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 : <u>Technical</u> 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 – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

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<b>PART-I B</b>	
	<p><b>ENVELOPE – II superscribed as:</b> PART-I (EMD/COST of TENDER) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:</p> <p><b>CONTAINING THE FOLLOWING:-</b></p>
i.	<p>1. Earnest Money Deposit (EMD) in the form as indicated in this Tender <b>OR</b> Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender</p> <p>2. Cost of Tender ( Demand Draft or copy of Cash Receipt as the case may be)</p>

<b>PART-II</b>	
	<p><b>PRICE BID</b> consisting of the following shall be enclosed</p> <p><b>ENVELOPE-III</b> superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:</p> <p><b>CONTAINING THE FOLLOWING</b></p>
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I
ii	Volume II – PRICE BID ( Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)

<b>OUTER COVER</b>	
	<p><b>ENVELOPE-IV (MAIN ENVELOPE / OUTER ENVELOPE)</b> superscribed as: TECHNO-COMMERCIAL BID, PRICE BID &amp; EMD TENDER NO: NAME OF WORK: PROJECT: DUE DATE OF SUBMISSION:</p> <p><b>CONTAINING THE FOLLOWING:</b></p>
i	<ul style="list-style-type: none"> <li>o Envelopes I</li> <li>o Envelopes II</li> <li>o Envelopes III</li> </ul>

**SPECIAL NOTE :** All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.

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.

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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:**

**Bidders 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 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if latest bid submission is in Aug 2011, then the 'load' shall be calculated upto and inclusive of June 2011)

i). 
$$\frac{\text{Total number of Packages}}{\text{Total number of Packages in hand}} = P$$
Where

- 'P' is the sum of all unit wise identified packages under execution with BHEL Regions as of the cut off month defined above, including packages yet to be commenced, excepting packages which are on HOLD due to reasons not attributable to Bidder..

II. **PERFORMANCE:** Here 'Monthly Performance' of the bidder for all the packages (**under execution/** executed during the 'Period of Assessment' in all the 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 the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if 'latest date of bid submission' is in Aug 2011, then the 'performance' shall be assessed for a 6 month period upto and inclusive of June 2011, 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) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions =  $P_T$  (ie  $P_T = P_1 + P_2 + P_3 + P_4 + \dots + P_N$ )
- b) Number of Months 'T<sub>1</sub>' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package P<sub>1</sub>. Similarly T<sub>2</sub> for package P<sub>2</sub>, T<sub>3</sub> for package P<sub>3</sub>, etc for the tendered scope. Now calculate cumulative total months 'T<sub>T</sub>' for total similar Packages 'P<sub>T</sub>' for all Regions (ie  $T_T = T_1 + T_2 + T_3 + T_4 + \dots + T_N$ )

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- c) Sum 'S<sub>1</sub>' of 'Monthly Performance Evaluation' Scores (S<sub>1-1</sub>, S<sub>1-2</sub>, S<sub>1-3</sub>, S<sub>1-4</sub>, S<sub>1-5</sub>,... S<sub>1-N</sub>) for similar package P<sub>1</sub>, for the 'period of assessment' 'T<sub>1</sub>' (i.e S<sub>1</sub> = S<sub>1-1</sub>+ S<sub>1-2</sub>+ S<sub>1-3</sub>+ S<sub>1-4</sub>+ S<sub>1-5</sub>+...S<sub>1-N</sub>). Similarly S<sub>2</sub> for package P<sub>2</sub> for period T<sub>2</sub>, S<sub>3</sub> for package P<sub>3</sub> for period T<sub>3</sub>, etc for the tendered scope for all Regions. Now calculate cumulative sum 'S<sub>T</sub>' of 'Monthly Performance Evaluation' Scores for total similar Packages 'P<sub>T</sub>' for all Regions (i.e 'S<sub>T</sub>' = S<sub>1</sub>+ S<sub>2</sub>+ S<sub>3</sub>+ S<sub>4</sub>+ S<sub>5</sub>+... S<sub>N</sub>).
- d) **Overall Performance Rating 'R<sub>BHEL</sub>' for the similar Package/Packages (under execution/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL):**

**Aggregate of Performance scores for all similar packages in all the Regions**

= -----  
**Aggregate of months for each of the similar package for which performance should have been evaluated in all the Regions**

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

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

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

Sl no	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
1	Similar Packages for all Regions → (under execution/ executed during period of assessment)	P <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> ie 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 Package ( 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>

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

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

- a) 'Period of Assessment.
- b) 12 months preceding the cut-off month
- c) 24 months preceding the cut-off month
- d) 36 months preceding the cut-off month

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

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

Sl no	Overall Performance Rating ( $R_{BHEL}$ )	Corresponding value of 'L'
1	=60	NA
2	> 60 and $\leq$ 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 9.I)

**IV. Explanatory note:**

- a) Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or CI, 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, CI, 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

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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 (ie Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above

b) Identified Packages (Unit wise)

**Table-1**

	Civil	Electrical & CI	Mechanical
	i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	i). Electrical ii). CI iii). Others (Elec & CI)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping iv). ESP 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 Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

c) Bidders who have not been evaluated for at least six package months in the last 36 months in the online BHEL system for contractor performance evaluation in BHEL PS Regions, wef July'2010 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 execution of work for a period of not less than 09 months, from the commencement of work of first package

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 'Capacity Evaluation of Bidders'.

d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating 'R<sub>BHEL</sub>'** only, starting from the upper band.

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

- i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries

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- .....
- ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)
  - iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.

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

- f) 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, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.
- 12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.
- 13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.
- 14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.
- 15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at 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 authorised 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.

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- 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.
- 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 'Stand alone' 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

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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.
- 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 'stand alone' 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 2% 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 1% of the total contract value in addition to the SD to be submitted by the prime Bidder for the total contract value.
- 23.15 In case of a Technical Tie up, all the clauses applicable for the Consortium partner shall be applicable for the Technical Tie up partner also
- 24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements' duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.
- 25.0 The bidder may have to produce original document for verification if so decided by BHEL.
- 26.0 Order of Precedence  
In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:
- a. Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
  - b. Notice Inviting Tender (NIT)
  - c. Price Bid
  - d. Technical Conditions of Contract (TCC)—Volume-1A
  - e. Special Conditions of Contract (SCC) —Volume-1B
  - f. General Conditions of Contract (GCC) —Volume-1C
  - g. Forms and Procedures —Volume-1D

It may please be noted that guidelines/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

AGM Pur

**Enclosure**

- Annexure-1: Pre Qualifying criteria.  
Annexure-2: Check List.  
Annexure-3: Integrity Pact  
Annexure-4: Important Information.  
Annexure-5: Other Tender documents as per this NIT.

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**ANNEXURE - 1**

**PRE QUALIFYING CRITERIA**

JOB	COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE FOR 2X800 MW UNIT # 1 & UNIT # 2, NTPC LARA AT VULLAGE-LARA, DISTRICT-RAIGARH CHHATISGARH. <b>(Unit 1 &amp; Unit 2 shall be awarded to 2 separate agencies)</b>
TENDER NO	<b>BHE/PW/PUR/LRPT - ESP U#1/1260 (For Unit # 1 ESP)</b> <b>BHE/PW/PUR/LRPT - ESP U#2/1261 (For Unit # 2 ESP)</b>

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria	Page no of supporting document. <b>Bidder must fill up this column as per applicability</b>
A	Submission of Integrity Pact duly signed (if applicable) (Note: To be submitted by Prime Bidder & Consortium/Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	<b>APPLICABLE</b>	
B	<b><u>Technical</u></b> <b>B.1)</b> Bidder must have executed Erection, Testing and Commissioning of at least One Boiler/ESP of One Unit of 190 MW or higher rating  OR <b>B.2)</b> Bidder must have executed Erection, Testing and Commissioning of at least One STG of 400 MW or higher rating, under direct order of BHEL	<b>APPLICABLE</b>	
C-1	<b><u>Financial TURNOVER</u></b> Bidders must have achieved an average annual financial turnover (Audited) of <b>Rs 345 Lakhs</b> or more over last three Financial Years (FY) i.e. 2011-2012, 2012-2013, 2013-14 OR 2010-2011, 2011-12 and 2012-13 if Annual Accounts for FY 2013-14 are not audited.	<b>APPLICABLE</b>	
C-2	<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>	
C-3	<b><u>PROFIT</u></b> Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three Financial Years defined in 'C-1' above based on latest Audited Accounts.	<b>APPLICABLE</b>	

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D	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)	<b>APPLICABLE</b>	By BHEL
E	Approval of Customer (if applicable)  <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>	BY BHEL
F	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>APPLICABLE</b>	BY BHEL
F	Technical Tie up criteria (if applicable)	<b>Not APPLICABLE</b>	
<p><b><u>Explanatory Notes for the PQR (unless otherwise specified in the PQR):</u></b></p> <ol style="list-style-type: none"> <li>Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above along with all annexures</li> <li>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 i.e total divided by three.</li> <li>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. (Net worth is required to be evaluated in case of companies)</li> <li>C-3:- PROFIT : shall be NET profit (PAT + Non cash expenditure viz depreciation) earned during any one of the three financial years as in C-1 above</li> <li><del>'Additional' Criteria in respect of 'Technical' criteria of PQR (as in 'B' above) for Civil, Electrical, CI, unless otherwise specified:</del> <ol style="list-style-type: none"> <li><del>Bidder should have executed similar work of any one of the following:</del> <ol style="list-style-type: none"> <li><del>One (1) work of value not less than Rs XXX</del> <del>OR</del></li> <li><del>Two (2) works of not less than Rs YYY</del> <del>OR</del></li> <li><del>Three (3) works of not less than Rs ZZZ</del> (Value XXX, YYY, ZZZ shall be as indicated by BHEL)</li> </ol> </li> <li><del>'Similar' work for criteria 5 above means</del> <ol style="list-style-type: none"> <li><del>Civil or Structures or Civil &amp; Structures or Chimney respectively as applicable to the tendered scope in respect of 'CIVIL' Works</del></li> <li><del>Electrical works in respect of 'ELECTRICAL'</del></li> <li><del>CI works in respect of 'CI' Works</del></li> <li><del>Material Handling and/or Management works in respect of 'MM' works</del></li> </ol> </li> </ol> </li> <li>Time period for achievement of the 'Technical' criteria of PQR (as in 'B' above) will be the last 7 years ending on the 'latest date' of Bid submission</li> <li>'EXECUTED' means the Vendor should have achieved the criteria specified in the Technical criteria of PQR (as in 'B' above) even if the Contract has not been completed or closed</li> <li>Unless otherwise specified, for the purpose of 'Technical' criteria of PQR ( as in 'B' above), the word 'EXECUTED' means: <ol style="list-style-type: none"> <li>Term 'Commissioning' indicated in PQR refers to 'assistance to commissioning' / 'commissioning'</li> <li>"BOILER LIGHT UP" in respect of Boiler &amp; Aux and ESP</li> <li>"SYNCHRONISATION" in respect of STG/GTG and 'SPINNING' in case of HTG</li> <li>"STEAM BLOWING COMPLETION" in respect of at least Main Steam Line of Power Cycle Piping</li> <li>"HYDRAULIC TEST" of the system in respect of Structures, Pressure parts/IBR Piping</li> <li>"CHARGING" in respect of power Transformers, Bus ducts, HT/LT switchgears</li> </ol> </li> </ol>			

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	<p>7. <del>Completion of RCC Shell and liner (steel or brick as per tendered scope) up to the HEIGHT specified using slip form" in case of RCC Chimney.</del></p> <p>8. <del>Achievement of physical Quantities as per respective PQRs in respect of Civil &amp; Structures and Piling Works</del></p> <p>9. <del>'Readiness for coal Filling" in respect of Bunker Structure Work.</del></p> <p>9. -Boiler means HRSG or WHRB or any other types of Steam Generator</p> <p>10. <del>Critical/Power Cycle piping means Main Steam, Hot Reheat, Cold Reheat, HP Bypass, LP Bypass lines</del></p> <p>11. For the purpose of evaluation of the PQR, one MW shall be considered equivalent to 3.5TPH where ever rating of HRSG/BOILER is mentioned in MW. Similarly, where ever rating of Gas Turbine is mentioned in terms of Frame size, ISO rating in terms of MW shall be considered for evaluation.</p> <p>12. <del>In case the experience/POAWO certificate enclosed by bidders do not have separate break up prices for the E&amp;C portion of Electrical and CI Works, (i.e. the certificates enclosed are for composite order for supply and erection of Electrical &amp; CI and other works if any), then value of Erection and Commissioning for the Electrical &amp; CI portion shall be considered as 15% of the supply &amp; erection of Electrical &amp; CI, unless otherwise specifically indicated in the PQR.</del></p> <p>13. <del>Scope for capital overhaul of STG shall cover Bearing Inspection work and overhauling of all cylinders of the Turbine unless otherwise specifically indicated in the PQR.</del></p> <p>14. In case the tendered scope is not a Pulverised Fuel Boiler, experience of Oil/Gas Fired Boilers also can be considered unless otherwise specifically indicated in the PQR</p> <p>15. The value of work (Experience submitted against PQR B) shall be updated as per the PVC indices for "All India Avg. Consumer Price Index for Industrial Workers" with base month as date of execution (completion of contract/work) and indexed upto two months prior to bid opening month.</p>
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BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

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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: <u>Please tick (✓) whichever applicable:-</u> ONE TIME EMD / 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	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	YES
11	Declaration by Authorised Signatory	Applicable/ <del>Not Applicable</del>	YES/NO
12	No Deviation Certificate	Applicable/ <del>Not Applicable</del>	YES/NO
13	Declaration confirming knowledge about Site Conditions	Applicable/ <del>Not Applicable</del>	YES/NO
14	Declaration for relation in BHEL	Applicable/ <del>Not Applicable</del>	YES/NO

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Website : www.bhel.com

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15	Non Disclosure Certificate	Applicable/ <del>Not Applicable</del>	YES/NO
16	Bank Account Details for E-Payment	Applicable/ <del>Not Applicable</del>	YES/NO
17	Capacity Evaluation of Bidder for current Tender	Applicable/ <del>Not Applicable</del>	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	Applicable/ <del>Not Applicable</del>	YES/NO
19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/ <del>Not Applicable</del>	YES/NO
20	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 itself 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 /

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additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

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

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

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
- 2.1.1 the Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The bidder(s)/ 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 IPC/PC 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 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.

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**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 for Suspension 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.

**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**

- a. The Bidder(s)/ Contractor(s) undertake(s) to obtain from his sub-contractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20% of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).
- b. The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- c. The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

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**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.
- 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 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

- .....
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC/PC 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.
- 8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.10 The word 'Monitor' would include both singular and plural.

**Section 9 – Pact Duration**

- 9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.
- 9.2 If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as 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.
- 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)

## IMPORTANT INFORMATION

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. All Statutory Requirements as applicable for this project shall be complied with.
3. Please take note of following Revised Tender Clauses:
  - i. Notice Inviting Tender: SI No 9
  - ii. General conditions of Contract: Clause No 1.15.13 (New), Clause No 2.8.3, 2.8.4 and 2.8.5
4. 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.
5. This is a combined tender for E & C of 2 units of 800 MW ESP Package (Unit 1 & 2 at NTPC Lara).
  - i. Tender specification (Volume I) is common for both units (Unit 1 & 2).
  - ii. Unit 1 & Unit 2 shall be awarded to separate agencies.
  - iii. L-1 Bidder shall be considered for award of Unit-1.
  - iv. For award of UNIT-2, next bidder in the order of their price competitiveness ( i.e L-2, then L-3 and hence forth) shall be given an option to match their price/rate, with the Awarded/Finalised price/rate of UNIT 1. In case none of the bidders agree to match the Awarded price/RATE of UNIT-1, then BHEL may consider awarding the UNIT-2 to L-1 bidder or opt any other suitable method to finalize UNIT-2.

## 6. PRICE VARIATION CLAUSE

**Revision in Price Variation Compensation Clause no. 2.17 of Vol I C GCC:**

**Clause No. 2.17.9 of Vol IC GCC is revised as below:-**

PVC shall be applicable only during the extended period of contract (if any) after the schedule completion date for the portion of work delayed / backlog for the reasons not

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attributable to Contractor. However total quantum of Price Variation amount payable/recoverable shall be regulated as follows:

- i. For the portion of backlog attributable to the contractor and for the portion of backlog due to force majeure condition during contract period, PVC shall not be paid.
- ii. For the period of force Majeure during extended contract period, PVC will be as per the indices applicable at the beginning of the force majeure period.
- iii. void
- iv. The total amount of PVC shall not exceed 20% of the cumulatively executed contract value during the extended contract period. Executed contract value for this purpose is exclusive of PVC, ORC, Supplementary/Additional Items and Extra works.

**Clause No. 2.17.5 of is modified as below:-**

Base date shall be the calendar month of the (schedule completion date of the contract + Period extended for the reasons due to Force Majeure Condition). Schedule Completion date shall be the actual start date plus contract period as defined in Chapter VI 'Vol IA TCC'

**7. OVER RUN COMPENSATION**

**Modification in OVER RUN COMPENSATION Clause no. 2.12 of Vol I C GCC:**

**Clause No. 2.12 of Vol IC GCC is Revised as below:-**

IF THE CONTRACT IS EXTENDED BEYOND THE CONTRACT PERIOD FOR ANY REASON OTHER THAN THOSE ATTRIBUTABLE TO THE CONTRACTOR OR FORCE MAJEURE CONDITIONS, THE CONTRACTOR WILL BE COMPENSATED BY PAYMENT OF OVERRUN CHARGES AT THE RATE OF **RS.100000/- (One Lakh Only)** PER MONTH. OVERRUN COMPENSATION WILL BE PAID FOR THE EXTENSION ATTRIBUTABLE TO BHEL ONLY. NO OVERRUN COMPENSATION WILL BE PAYABLE FOR THE EXTENSION ON ACCOUNT OF REASONS ATTRIBUTABLE TO CONTRACTOR AND/OR FORCE MAJEURE CONDITIONS. OVERRUN COMPENSATION FOR ELIGIBLE PERIOD SHALL BE IN PROPORTION TO THE PROGRESS ACHIEVED AGAINST THE PLAN FOR RESPECTIVE PERIOD.

**8. 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 is given in NIT:

- 8.1. Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).
- 8.2. BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance 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 Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in

**BHEL PSWR  
Notice Inviting Tender**

**Tender Specification No: BHE/PW/PUR/LRPT-ESP U # 1/1260  
BHE/PW/PUR/LRPT-ESP U # 2/1261**

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- .....
- Reverse Auction will have to necessarily submit „online sealed bid“ in the Reverse Auction. Non-submission of „online sealed bid“ by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
- 8.3. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
  - 8.4. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit ‘online sealed bid’ in the Reverse Auction. Non-submission of ‘online sealed bid’ by the bidder for any of the eligible items for which techno-commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
  - 8.5. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
  - 8.6. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
  - 8.7. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
  - 8.8. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.
  - 8.9. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at “Total Cost to BHEL” like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for noncompliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
  - 8.10. Reverse auction will be conducted on scheduled date & time.
  - 8.11. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
  - 8.12. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VII) as provided on case-to-case basis to Service provider within two working days of Auction without fail.
  - 8.13. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL’s standard practice.
  - 8.14. Bidders shall be required to read the “Terms and Conditions” section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the “Business Rules of Reverse Auction”, which will be communicated before the Reverse Auction.
  - 8.15. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

**BHEL PSWR  
Notice Inviting Tender**

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- .....
- 8.16. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
- 8.17. In case BHEL decides to go for reverse auction, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



## TECHNICAL CONDITIONS OF CONTRACT (TCC) CONTENTS

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2	Scope of Works	Chapter-II	2
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5	T&Ps and MMEs to be deployed by BHEL on sharing basis	Chapter-V	1
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8	Taxes and other Duties	Chapter-VIII	1
9	Specific Inclusion	Chapter-IX	2
10	Specific Exclusion	Chapter-X	1
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	Estimated Weights of Various Systems in Scope of Work	Annexure I	3
	Painting Scheme	Annexure II	1
11	Erection Testing and commissioning of ESP		33

TECHNICAL CONDITIONS OF CONTRACT (TCC)  
Chapter - I: Project Information

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<b>1.0</b>	<b>Project Information</b>
<b>1.1</b>	<p>1. Purchaser / Owner : <b>N T P C Limited</b></p> <p>2. Project Title : <b>2X800 MW NTPC LARA STPP STAGE-I (ESP PKG)</b></p> <p><b><u>LOCATION AND APPROACH :</u></b></p> <p>1. Location : VILLAGE - Chhapora, Lara &amp; Lohakhan.</p> <p>2. Nearest City : The site is about 30 Km from Raigarh city.</p> <p>3. Nearest Air Port : Raipur 250 km</p> <p>4. Railway Approach : Nearest Railway Station Raigarh Railway station</p> <p>5. Seismic Zone : Zone-II</p> <p>6. Coordinates :</p> <p style="padding-left: 20px;">a) Latitude : 21° - 44' - 57" (N)</p> <p style="padding-left: 20px;">b) Longitude : 83° - 25' - 37" (E)</p> <p>The Bidder shall visit site and get acquainted himself with the conditions prevailing at site before submission of the bid. The information's given here in under are for general guidance and shall not be contractually binding on BHEL/ Owner. All relevant site data's/information's as may be necessary shall have to be obtained /collected by the Bidder.</p>

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter - II: Scope of Works

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### 2.0 SCOPE OF WORK

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IS BROADLY AS UNDER: -

THE SCOPE OF WORK OF THIS TENDER SPECIFICATION FOR COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF ESP PACKAGE INCLUDING, INSULATION, FINAL PAINTING ETC OF ESP PACKAGE FOR 2X800 MW NTPC LARA . VILLAGE- LARA, DIST. - RAIGARH, CHHATISGARH SHALL BE BROADLY AS UNDER:

- 1) COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD; TRANSPORTATION TO SITE, ERECTION, TESTING & ASSISTANCE FOR COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF ELECTROSTATIC PRECIPITATOR, INSULATION, FINAL PAINTING ETC. OF. ESP FOR 2X800 MW NTPC LARA . VILLAGE- LARA, DIST. - RAIGARH, CHHATISGARH
- 2) ERECTION, ALIGNMENT AND WELDING, BOLTING, FASTENING, GROUTING AS APPLICABLE OF:
  - ✓ ELECTROSTATIC PRECIPITATOR AND STAIRWAYS & GALLERIES
- 3) PRE-ASSEMBLY, IF ANY, PRE-ERECTION CHECKS AS APPLICABLE
- 4) E&C WORK OF ELECTRICAL AND C&I ITEMS IN THE SUPPLY SCOPE OF BHEL UNITS AND ASSOCIATED TO ESP
- 5) INSULATION OF ALL EXPOSED METAL PARTS OF THE EQUIPMENTS INCLUDING, STRUCTURES ETC.
- 6) PRE-COMMISSIONING CHECKS/TESTS, TRIAL RUNS/TESTING AND COMMISSIONING
- 7) FINAL PAINTING OF ERECTED ITEMS
- 8) TRIAL OPERATION AND ASSOCIATED TESTS
- 9) MAKING UNIT READY FOR PG TEST AND ASSISTANCE FOR CONDUCTANCE.
- 10) COMPLETION OF ALL FACILITIES/SYSTEMS
- 11) HANDING OVER OF THE UNIT

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – III: Facilities in the scope of Contractor/BHEL**

Sl. No	Description	Scope / to be taken care by		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 PURPOSES OF THE BIDDER</b>			
a	Open space for labour colony		Yes	

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – III: Facilities in the scope of Contractor/BHEL**

Sl. No	Description <b>PART I</b>	Scope / to be taken care by		Remarks
		BHEL	Bidder	
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</b> of Voltage 415 V, A.C., 3 Phase, 50 Hz	Yes		FREE (however any taxes, duties, levy etc. as charged by customer, shall be paid by contractor.)
a	Single point source	Yes		At a distance of 1000 M from site (Distance is only tentative, it may vary upto an extent depending on site condition)
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>Electricity for the office, stores, canteen etc of the bidder</b>			As available from customer and charges as charged by customer
a	Single point source	Yes		At a distance of 1000 M from site (Distance is only estimated, it may vary upto an extent depending on site condition)
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – III: Facilities in the scope of Contractor/BHEL**

Sl. No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
	<b>PART I</b>			
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	<b>Electricity for living accommodation of the bidder's staff, engineers, supervisors etc</b>			As per availability from customer and charges as charged by customer this is for only under project premises
a	Single point source	Yes		<b>Chargeable Basis</b> At a distance of 1000 M from site (Distance is only estimated, it may vary upto an extent depending on site condition)
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>WATER SUPPLY</b>			
3.3.1	<b>For construction purposes:</b>			
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	
3.3.2	<b>Water supply for bidder's office, stores, canteen etc.</b>			
a	Making the water available at single point		Yes	

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – III: Facilities in the scope of Contractor/BHEL**

Sl. No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.3	<b><u>Water supply for Living Purpose</u></b>			
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	

TECHNICAL CONDITIONS OF CONTRACT (TCC)  
Chapter – III: Facilities in the scope of Contractor/BHEL

Sl. No	Description <b>PART I</b>	Scope / to be taken care by		Remarks
		BHEL	Bidder	
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	Telephone, fax, internet, intranet, e-mail etc.		Yes	
3.6.0	<b>COMPRESSED AIR wherever required for the work</b>		<b>YES</b>	
3.7.0	<b>Demobilization of all the above facilities</b>		<b>YES</b>	
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**

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Sl. No	Description <b>PART II</b> <b>3.9.0 ERECTION FACILITIES</b>	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.9.1	Engineering works for construction:			
a	Providing the erection drawings for all the equipments covered under this scope	Yes		
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- example – routing of small bore pipes		<b>YES</b>	”
d	Shipping lists etc for reference and planning the activities	Yes		”
e	Preparation of site erection schedules and other input requirements		Yes	”
f	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	”
g	Weekly erection schedules based on SL No. e		Yes	”
h	Daily erection / work plan based on SL No. g		Yes	”

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – III: Facilities in the scope of Contractor/BHEL**

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Sl. No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
	<b>PART II</b> <b>3.9.0 ERECTION FACILITIES</b>			
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	
j	Preparation of preassembly bay		Yes	
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself		Yes	
L	Arranging the materials required for preassembly		Yes	

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – IV: T&Ps and MMEs to be deployed by Contractor**

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SN	DESCRIPTION OF EQUIPMENT	CAPACITY	MINIMUM QUANTITY	REMARKS
01	CRAWLER CRANE	40 T	01	TO BE DEPLOYED FROM BEGINNING FOR START OF ERECTION TILL COMPLETION OF INLET/OUTLET FUNNEL ERECTION
02	MOBILE CRANE F-15.  (HYDRAULICALLY OPERATED WITH TURRET FUNCTION)	14 T	01	TO BE DEPLOYED FROM THE START OF ERECTION TILL COMPLETION
03	PICK AND CARRY CRANE	12 T	01	TO BE DEPLOYED FROM BEGINNING FOR START OF ERECTION TILL COMPLETION
04	AIR COMPRESSOR (ELECTRIC)	140 CFM	01	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
05	SELF DRILLING CUM TAPPING MACHINE FOR SCREWS OF FLOOR GRILL & ROOF SHEETING WORK	AS REQUIRED	02	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
06	3 ph DISTRIBUTION BOARD WITH COMPLETE SET UP FOR DRAWING CONSTRUCTION POWER, FITTED WITH ENERGY METER	AS Required	As required	AS REQUIRED AND AS PER INSTRUCTION OF BHEL ENGINEER
07	WELDING GENERATOR (ELECTRIC & DIESEL)	300 -400 AMPS	AS REQUIRED	TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER
08	ELECTRIC WINCH	1.5TON / 2 TON / 3 TON	04 (TOTAL)	TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER
	ELECTRIC WINCH	05 TON	02	TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER

BHEL-PSWR

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – IV: T&Ps and MMEs to be deployed by Contractor**

	ELECTRIC WINCH	15-20 TON	02	TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER
09	ELECTRIC CABLE FOR DRAWAL & DISTRIBUTION OF CONSTRUCTION POWER	AS REQUIRED	AS REQUIRED	TO BE DEPLOYED FROM BEGINNING OF START OF ERECTION TILL COMPLETION
10	BAKING OVEN AND HOLDING OVEN WITH THERMOSTAT AND TEMPERATURE GAUGE FOR BAKING COATED WELDING ELECTRODES	AS REQUIRED	01 SET EACH	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
11	PORTABLE OVEN FOR COATED WELDING ELECTRODES	AS REQUIRED	05 SET	TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER
12	TRAILER WITH PRIME MOVER	ADEQUATE CAPACITY	AS REQUIRED	1 NO. TO BE DEPLOYED FROM BEGINNING OF START OF ERECTION TILL COMPLETION . ANY ADDITIONAL TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER VEHICLES DEPLOYED SHOULD HAVE VALID STATUTORY DOCUMENTS AT ALL TIMES
14	SLINGS, 'D'-SHACKLES, HYDRAULIC JACKS, ETC.	AS REQUIRED	AS REQUIRED	WITH TEST REPORTS
15	SCAFFOLDING PIPE ALONG WITH ITS ALL ACCESSORY FOR FIXING	NOS	3500	FROM START OF INSULATION ACTIVITY(STANDARD LENGTH OF PIPE SHOULD BE 6 M AND ABOVE)
16	HUCK CHUCK/POWER MAX PULLER	2 T	AS REQUIRED	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER. WITH VALID TEST REPORTS

BHEL-PSWR

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – IV: T&Ps and MMEs to be deployed by Contractor**

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17	CHAIN BLOCK	2T/3T/5T/10 T	AS REQUIRED	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER. WITH VALID TEST REPORTS
18	WIRE ROPE PULLY	2T/3T/5T/15T/20T	AS REQUIRED	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER. WITH VALID TEST REPORTS
19	CHOCK SAW MACHINE FOR ELECTRIC AL WORKS	AS REQUIRED	AS REQUIRED	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
20	MAGNETIC DRILL MACHINE FOR ELECTRICAL WORKS	8MM-22MM	01	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
21	GRINDING MACHINE	AG4, AG5, AG7	AS REQUIRED	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
22	WOODEN SLEEPERS	ASSORTED SIZES	100 NOS.	TO BE DEPLOYED FROM BEGINNING OF START OF ERECTION
23	ELECTRIC /DIESEL GROUT MIXTURE MACHINE	AS REQUIRED	01	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – IV: T&Ps and MMEs to be deployed by Contractor

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**IN CASE THE CONTRACTOR DOES NOT DEPLOY OR DELAYS DEPLOYMENT OF MAJOR T&P WITH REFERENCE TO SCHEDULE SPECIFIED ABOVE TABLE, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER DAY OF DELAY IN THE FOLLOWING MANNER:**

- |   |                                |
|---|--------------------------------|
| <b>1. IN RESPECT OF EACH 40 MT CRANE:</b>           | <b>@ RS. 4,000 / -Per Day</b>  |
| <b>2. IN RESPECT OF EACH 14 MT CRANE:</b>           | <b>@ RS. 2,000 / - Per Day</b> |
| <b>3. IN RESPECT OF EACH 12 MT CRANE:</b>           | <b>@ RS. 2,000 / - Per Day</b> |
| <b>4. IN RESPECT OF SCAFFOLDING PIPE per Piece:</b> | <b>@RS. 60 Per month</b>       |

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

AS PER REQUIREMENT TO BE FINALIZED AT SITE, SHALL MEET THE REQUIREMENTS AS PER FIELD QUALITY PLAN AND OTHER ERECTION, TESTING RELATED ACTIVITIES.

### **NOTE:**

- 1) ALL THE TOOLS AND PLANTS REQUIRED FOR THIS SCOPE OF WORK, EXCEPT THE TOOLS & PLANTS PROVIDED BY BHEL ARE TO BE ARRANGED BY CONTRACTOR WITHIN THE QUOTED RATES. THE LIST IS SUGGESTIVE IN NATURE. ANY ADDITIONAL T&P REQUIRED TO BE ARRANGED BY THE CONTRACTOR.
- 2) IF ABOVE MENTIONED T & P ARE NOT DEPLOYED IN SPECIFIED TIME BHEL WILL CHARGE TO CONTRACTOR CURRENT MARKET RATE + 30 % OVERHEADS FOR NON AVAILABILITY T&P OR LEVY A DAY WISE PENALTY FOR NON DEPLOYMENT OR DELAYED DEPLOYMENT.
- 3) IF THE WORKS GET DELAYED DUE TO NON-AVAILABILITY OF T&P, BHEL RESERVES THE RIGHT TO GET THE WORK DONE AT THE RISK AND COST OF CONTRACTOR WITHIN PREJUDICE TO RIGHTS OF BHEL AS IN GCC.
- 4) THE MANUFACTURING YEAR OF ALL MAJOR T&PS DEPLOYED BY THE CONTRACTOR (40 MT, CRAWLER CRANE, 14 MT MOBILE CRANE AND 12MT PICK & CARRY CRANE) SHOULD NOT BE MORE THAN 10 YEARS AS ON THE DATE OF DEPLOYMENT. IF AT ANY MOMENT OF TIME DURING THE EXECUTION OF WORK, ANY CRANE IS FOUND TO BE NOT IN A GOOD WORKING CONDITION AND NON-PERFORMING AT DESIRED MINIMUM CAPACITY, AS CERTIFIED BY BHEL ENGINEER, THE CONTRACTOR SHALL DEPLOY ANOTHER CRANE IN GOOD WORKING CONDITION WITH MINIMUM DESIRED CAPACITY. IF CONTRACTOR FAILS TO DEPLOY THE SAME WITH IN 10 DAYS, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER DAY OF DELAY AS PER THE RATES GIVEN ABOVE

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter – V: T&Ps and MMEs to be deployed by BHEL on sharing basis**

SN	DESCRIPTION AND CAPACITY OF T&P	QUANTITY	REMARKS
01	CRAWLER CRANE 100 T	01 NO.	THIS CRANE WILL BE PROVIDED FROM BEGINNING FOR START OF ERECTION
02	CRAWLER CRANE 150 T/180 T	01 NO.	THIS CRANE WILL BE PROVIDED AFTER 3 MONTHS FROM START OF ERECTION
03	HUCK BOLTING MACHINE COMPLETE SET WITH ACCESSORIES, CONSUMABLES AND SPARES AS NEEDED FOR NORMAL OPERATION	02 SET	NIL
04	AIR LEAK TEST EQUIPMENT MACHINE WITH ALL ACCESSORIES	01 SET	POWER CABLE FOR AIR LEAK TEST EQUIPMENT TO BE PROVIDED BY THE CONTRACTOR.

**NOTE:**

1. THESE CRANES ARE OWNED OR HIRED BY BHEL. **OPERATOR FOR BHEL OWNED CRANE/HIRING BASIS WILL BE PROVIDED BY BHEL.**
2. CONTRACTOR SHALL MAKE NECESSARY ARRANGEMENTS LIKE LYING OF SPECIAL SLEEPER BEDS AND STEEL PLATES (ALL ARRANGED BY CONTRACTOR), ASSEMBLY AND DISMANTLING OF HEAVY LIFT ATTACHMENT, BOOM, JIB ETC FOR MOVEMENT AND OPERATION OF THE CRANE
3. BHEL MAY OBTAIN THESE CRANES ON HIRING BASIS INCLUDING OPERATING AND MAINTENANCE CREW.
4. OPERATORS FOR HIRED CRANE WILL BE PROVIDED BY THE HIRING AGENCY.
5. CONTRACTOR SHALL PROVIDE THE FUEL FOR BHEL PROVIDED CRANES FOR HIS USE.
6. CRANES PROVIDED BY BHEL WILL BE ON SHARING BASIS WITH OTHER AGENCIES / CONTRACTORS OF BHEL. THE ALLOCATION OF CRANES SHALL BE THE DISCRETION OF BHEL ENGINEER, WHICH SHALL BE BINDING ON THE CONTRACTOR. CRANES WILL BE DEPLOYED AT APPROPRIATE TIME AS DECIDED BY BHEL FOR SUITABLE DURATION AND INTENDED PURPOSE.

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# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VI: Time Schedule

### 6.1 TIME SCHEDULE & MOBILIZATION

#### 6.1.1 INITIAL MOBILIZATION

After receipt of fax LOI, Contractor shall discuss with Project Manager / Construction Manager regarding initial mobilization. Contractor shall mobilize necessary resources within 2 weeks of issue of fax letter of intent or as per the directive of Project Manager / Construction Manager. Such resources shall be progressively augmented to match the schedule of milestones and commissioning.

#### 6.1.2 MOBILIZATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.

The activities for erection, testing etc. shall be started as per directions of Construction Manager of BHEL. Contractor shall mobilize further resources (in addition to those required for activities under clause no. 6.1.1) as per requirement to commence the work of erection, testing etc. of ESP and progressively augment the resources to match schedule of the project.

#### 6.1.3 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

#### **COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.**

Erection/placement on its designated foundation / location, of the first major permanent equipment / component / column covered in the scope of these specifications shall be recognized as “**Start of contract period for erection, testing, assistance for commissioning etc**”. Smaller items like packer plates, shims, anchors, inserts etc. will not be considered as start of contract period.

The Contractor has to subsequently augment his resources in such a manner that following major milestones of erection & commission are achieved on specified schedules:

According to the contract between BHEL and Owner the schedule of important milestones is as follows:

#### **Major L1 milestones for Unit 1 & 2**

SL No.	Milestones	UNIT – 1	UNIT – 2
	<b>Zero Date</b>	<b>31- Dec -2013</b>	
1	Commencement of ESP Erection	July-14	Nov-14
2	Completion of Testing & Commissioning for BLU	April-16	August -16
3	Completion of Testing & Commissioning for Balance	August-16	Dec-16
4	Completion of facilities	Nov-16	March-17

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter – VI: Time Schedule

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In order to meet above schedule in general, and any other intermediate targets set, to meet customer/ project schedule requirements, Contractor shall arrange & augment all necessary resources from time to time on the instructions of BHEL.

The contract period for completion of entire work under this scope shall be **28 (Twenty eight months)** from the “**Start of contract period for erection, testing, assistance for commissioning etc**” as specified earlier. There will be phase gap of 4 months between Unit-1 and Unit-2.

The period from the commencement of preparatory work for erection till the actual “start of contract period” shall not be reckoned for the above purpose.

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter-VII: Terms of Payment**

The progressive payment for Erection, Testing and Commissioning on accepted price of contract value (Rate schedule) will be released as per the break up given hereinafter:

<b>TERMS OF PAYMENT FOR ERECTION TESTING AND COMMISSIONING (Rate schedule)</b>			
	<b>Contract (Main Package) Identification ----&gt;</b>	<b>ESP</b>	<b>INSULATION</b>
SL NO	<b>Rate schedule Identification -----&gt;</b>	ESP	1) Castable & Pourable 2) Iron Components 3) Wool mattresses 4) Aluminium sheeting
<b>I</b>	<b>PRO RATA PAYMENTS (85%)</b>		
1.1	ON PRE-ASSEMBLY WHEREVER APPLICABLE ( IF NOT APPLICABLE, THIS PORTION SHALL BE CLUBBED WITH PLACEMENT IN POSITION)	15	--
1.2	PLACEMENT IN POSITION	20	50
1.3	ALIGNMENT	15	15
1.4	WELDING/BOLTING/FIXING	20	20
1.15	COMPLETION OF HOPPERS ALONG WITH ALL DOORS, HEATING ELEMENTS, POKING DOORS, ETC	5	--
1.16	COMPLETION OF INNER, OUTER ROOF INSULATOR HOUSING, RECTIFIER TRANSFORMERS, PENT HOUSE MONO RAILS, HOISTS ETC	5	--
1.17	ERECTION OF EMITTING AND COLLECTING RAPPING SYSTEM WITH ALL DRIVES	5	--
	<b>TOTAL FOR PRO RATA PAYMENTS (TOTAL 85%)</b>	<b>85</b>	<b>85</b>
<b>II</b>	<b>STAGE/MILESTONE PAYMENTS (15%)</b>		
2.1	AIR & GAS TIGHTNESS TEST	1	--
2.2	GAS DISTRIBUTION TEST	1	--

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Tender Specification No: BHE/PW/PUR/LRPT-ESP U #1 & 2/1260-1261

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Chapter-VII: Terms of Payment**

2.3	CHARGING OF ESP FIELDS	5	--
2.18	Trial Operation of Unit	2	2
2.21	Painting	2	--
2.22	Area cleaning, temporary structures cutting/removal and return of scrap	1	9
2.23	Punch List points/pending points liquidation	1	1
2.25	Material Reconciliation	1	2
2.26	Completion of Contractual Obligation	1	1
	<b>TOTAL FOR STAGE/MILESTONE PAYMENTS (15%)</b>	<b>15</b>	<b>15</b>
	<b>TOTAL I + II</b>	<b>100</b>	<b>100</b>

Note: The terms of payment is only for enabling release of payments through RABs and is not indicative of the actual quantum of value of work

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

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### **8.0 TAXES, DUTIES, LEVIES (Consolidated Rev 03 dated 09/04/2013)**

#### **8.1. For All types of works excepting works covered under sl no 8.2**

##### **8.1.1**

The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

**However, provisions regarding Service Tax and Value Added Tax (VAT) on output services and goods shall be as per following clauses.**

##### **8.1.2 Service Tax & Cess on Service Tax**

Contractor's price/rates shall be exclusive of Service Tax and Cess on Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and pay the same to the concerned tax authorities, such applicable amount will be paid by BHEL at the prevailing Service Tax Rate (presently 12.36 %) on the admitted bill value.

**Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract. Contractor shall submit serially numbered Service Tax and Cess Invoice, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely,**

- 1. The name, address and the registration number of the contractor,**
- 2. The name and address of the party receiving taxable service,**
- 3. Description, classification and value of taxable service provided and,**
- 4. The service tax payable thereon.**

**All the Four conditions shall be fulfilled in the invoice before release of service tax payment.**

**Wherever, more than one route/option are available for discharge of service tax liability under a particular service, (e.g. "works contract Service"), contractor shall obtain prior written consent from BHEL site before billing the amount towards Service Tax.**

##### **8.1.3 VAT (Sales Tax /WCT)**

As regards Value Added Tax (VAT)/CST on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, the price quoted by the contractor shall be inclusive of the same and in no case input or output VAT/CST will be reimbursed extra.

In any case the Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill. Contractor will submit all the details of VAT/CST paid for the contract in the prescribed format of the respective state VAT laws. Also, the

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-VIII: Taxes and Other Duties

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contractor will issue the tax Invoices to BHEL as per the Tax laws of respective state on monthly basis. Contractor shall also be required to furnish to BHEL necessary proof of VAT remittance on monthly basis.

Deduction of tax at source shall be made as per the provisions of law and is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made.

Further, if BHEL, at the instance of customer or otherwise adopts the specific route for discharging output VAT liability itself, benefit of the reduction in liability of the contractor will be passed on to BHEL.

In case, BHEL is forced to pay any VAT liability on behalf of contractor, the same will be recovered from contractor's bill or otherwise as deemed fit

### 8.2 'Enabling Works'

~~The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit. ( i.e. rates quoted by bidder shall be inclusive of Service Tax, VAT/WCT and all other taxes and duties )~~

~~However, Since the proposed work is in the nature of 'Works Contract service' as per Service tax law, Hence, For non-corporate contractors being Individual, HUF, Proprietary Firm, Partnership Firm or Association of Persons (AOP), BHEL shall recover the applicable Service Tax under reverse charge mechanism from the contractor and remit the same with the Government as per the provisions of Law. Necessary advice/confirmation of remittance shall be issued to the contractor. The contractor shall not be eligible for any refund/reimbursement of such service tax from BHEL. It shall be the responsibility of the contractor to submit proper invoice giving all the requisite details as per Service Tax Law for the determination of the service tax liability of BHEL under reverse charge mechanism. BHEL reserves the right to determine such liability based on the invoice submitted by the contractor or otherwise independently and remittance of the same with the Government.~~

### 8.3 New Taxes/Levies

In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same **before opening of Price Bid**. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-IX: SPECIFIC INCLUSIONS

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### SPECIFIC INCLUSIONS

1. Sub-delivery items and electrical components such as push-buttons, junction boxes etc.
2. E&C work of cable trays, cables and earthing etc
3. Control panels, EPMS, MCC etc.
4. Supply of primer and paints for final painting
5. All electrical and control & instrumentation related to items except those specified elsewhere in these specifications.
6. Testing and commissioning of heating elements, thermostats, HV rectifier transformers.
7. Testing and Commissioning of Electrical Operated Hoists and Also Load Testing
8. Supply of Sealing Compound for Insulation Cladding/Sheeting Work

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-X : SPECIFIC EXCLUSIONS

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### TERMINAL POINTS

The terminal points identified herein below shall be read in conjunction with the applicable tender drawings, scope of supply and Technical Specification of the various systems covered under Electrostatic Precipitator Package.

- (1) ESP inlet gas duct flanges (matching flanges included in the Contractor's scope).
- (2) ESP outlet gas duct flanges (matching flanges included in the Contractor's scope).
- (3) ESP ash collection hopper outlet flanges.
- (4) Employer's terminal points for clarified water supply at approx. 3M elevation near 1st row of ESP column of 1st unit of this Project for ESP washing.
- (5) Service/Instrument Air connection at Employer terminal point at about 4m elevation near 1st row of ESP column of 1st unit of this Project.
- (6) End of drain piping to the nearest station drain.
- (7) Incoming power terminals of bidders ESP MCC/ Auxiliary supply and Control Panel.
- (8) Incoming power terminals of TR set, rapper and other control panels.
- (9) Incoming power terminals of isolating switch of Cranes/Hoists.

### 10.00.00 EXCLUSIONS

Following are excluded from the Contractor's scope of supply and services :

- (i) Flue gas ducting up to inlet flanges of the ESP streams and from outlet flanges of ESP streams onwards.
- (ii) Station and instrument air compressors and other accessories.
- (iii) Air conditioning of the ESP Control Room for areas where solid state control equipment will be located.
- (iv) Fire hydrant system in ESP area.
- (v) Complete lighting system and lightning protection.
- (vi) Maintenance and calibration equipment required for routine maintenance and calibration of general instrumentation which are not in Contractor's scope.
- (vii) Earthing mat below ground.
- (viii) ESP column foundation, equipment foundation, paving and ash trenches below ESPs.
- (ix) ESP Control room building, compressor houses, ash handling control rooms.
- (x) Ash Handling Plant.
- (xi) Cable from opacity monitor to DDCMIS for 4-20 mA feedback

Note:-ABOVE LIST IS TENTATIVE ENGINEER INCHARGE DECISION WILL BE FINAL IN RESPECT OF DECIDING TERMINAL POINT.

**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Annexure-I ESTIMATED WEIGHT FOR VARIOUS SYSTEMS IN SCOPE**  
**OF WORK**

**APPENDIX -1**  
**LIST OF APPLICABLE PGMA'S FOR UNIT 1**

<b>ITEM WISE WEIGH DETAILS</b>			
<b>RANIPET SUPPLIED ITEMS</b>			
<b>A. ESP STRUCTURE</b>			
<b>SLNO</b>	<b>PGMA</b>	<b>DESCRIPTION</b>	<b>DESIGN WT</b>
1	79680	FOUNDATION MATLS FOR	38300
2	79681	SUPPOTING STRUCTURES	997500
3	79601	ROLL/SLIDE SUPPORTS	56600
4	79648	CASING STRUCTURE	630000
5	79643	HOPPER RIDGES	130000
6	79649	CASING SHELL/PANEL	975000
7	89610	EP GALLERIES&STAIRS	135000
8	89612	FLOOR GRILL AND STEP	90000
9	79628	ESP ROOF PANELS	260000
10	79619	COL ELEC SUSPENSION	220000
11	79613	EMIT SYST SUSPENSION	33000
12	79646	INSULATOR SUPP PANEL	173400
13	79621	EMIT SYS FRAME-TOP	217000
14	79632	EMIT SYS FRAME-MIDLE	358000
15	79622	EMIT SYS FRAME BOTOM	251000
16	79614	SUPPORT INSULATORS	14400
17	79620	COLLECTING ELECTRODE	2077000
18	79608	GAS DIST. ASSY	101200
19	79647	ROOF PANEL ASSY	233700
20	79650	INLET-OUTLET FUNNEL	250000
21	79657	SPLITTER&GUIDE VANES	41500
22	79624	SHOCK BARS	170600
23	79625	COLL ELECT RAPP MECH	155500
24	79611	GAS SCREEN-EP	63200
25	79615	EMITTING ELECTRODES	47300
26	79642	OUTER ROOF-EP	428600
27	79644	HOPPER UPPER PART	606100
28	79645	HOP MLD&LOWER PART	776700
29	79665	APP PLATFORM-HOPPER	240000
30	89613	FLOOR GRILL AND MOBI	157100

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**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Annexure-I ESTIMATED WEIGHT FOR VARIOUS SYSTEMS IN SCOPE**  
**OF WORK**

31	79616	EMIT ELECT RAPP MECH	62000
32	79617	DRIVE ARGT. FOR EMIT	62100
33	79606	INSULATOR HOUSING AS	92800
34	79655	PENT HOUSE FOR E P	210500
35	89614	PENT HOUSE ROOFING S	76600
36	79626	COLL ELEC RAPP DRIVE	13800
37	79609	GD-RAPPING MECHANISM	19200
38	79610	GD_DRIVE ARRANGEMENT	1400
39	79623	INSPECTION DOORS	36000
40	79659	CONTROL ROOM-INSERTS	39100
41	79631	GEARED MOTORS FOR RA	42500
42	79605	ESP-SUB-DELIVERY COM	1100
43	79690	HEATING ELEMENTS	1700
44	79691	PANEL TYPE HOPPER HE	45200
45	79630	ELECTRICAL SD COMPTS	27700
46	79637	JUNCTION BOX & PUSH	3200
47	79660	CABLE-CABLE RACKS	261200
48	79662	EARTHING,CABLE TRAYS	143700
49	79666	WATER WASHING SYSTEM	9000
50	79641	ELECTRICAL MISCELLAN	5000
51	79672	INTERLOCKS-EP	2500
52	79692	AUXILIARY CONTROL PA	51700
53	79678	BAPCON & ACCESSORIES	1200
54	79673	ELECTRICALLY OPERTD	11800
55	79694	STATCON PANEL	1800
56	79695	IOS PANEL	300
57	79674	OPACITY MONITOR & AC	1400
58	79663	ASH LEVEL INDICATOR	4400
59	79661	EP PERF TEST EQUIPT	1300
60	79664	MISCELLANEOUS ITEMS	15000
61	89611	ESP ROOF HANDRAILS	15300
62	79988	COMMISSIONING SPARES	1300
63	79996	TOOLS & TACKLES	400
		SUB TOTAL OF A.	11189900
<b>B.</b>			
<b>INSULATION</b>			
1	89615	INSULATION CLADDING	105100
2	79668	FIXING COMP. FOR ESP	175000
3	79667	MIN WOOL FOR ESP INS	480000

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**TECHNICAL CONDITIONS OF CONTRACT (TCC)**  
**Annexure-I ESTIMATED WEIGHT FOR VARIOUS SYSTEMS IN SCOPE**  
**OF WORK**

		SUB TOTAL OF B.	760100
		GRAND TOTAL(A+B)	11950000
<b>JHANSI SUPPLIED ITEMS</b>			
SLNO	PGMA	DESCRIPTION	DESIGN WT
1		HVR TRANSFORMER (121 NOS)(Including Spare)	229900
2		ELECTRONIC CONTROLLER(120 NOS)	36000
		GRAND TOTAL	265900

**NOTES:**

- Besides product groups indicated herein, there is likelihood of addition of new product groups by BHEL' s unit for release of some items, integral to this work. Tenderers' quoted unit rates shall be applicable for such product groups also.
- The weights given against PGMA's listed above are tentative. It may change after detailed engineering is done. Rate quoted by the Contractor shall not change due to variation in weight.
- Rate Schedule Identified for PGMA's of Insulation are Indicative only and based on envisaged material specification. Payment shall be made on the basis of material specification of actual material received and erected at site.
- BHEL's decision with regard to classification of a particular product group for applicable rate category shall be final & binding on the Contractor.
- Besides the above, weight of all temporary piping, valves, pumps, tanks and other miscellaneous equipments etc, as stated elsewhere will get added.

TECHNICAL CONDITIONS OF CONTRACT (TCC)  
Annexure-II PAINTING SCHEME

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(Will be issued during Execution)

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-XI Erection Testing and Commissioning of ESP

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### **GENERAL REQUIREMENTS – COMMON TO ALL WORK OF ERECTION TESTING AND COMMISSIONING**

#### 11.1.1

The intent of specification is to provide services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient execution of this work shall not relieve the Contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

#### 11.1.2

The terminal points decided by BHEL shall be final and binding on the Contractor for deciding the scope of work and effecting payment for the work done.

#### 11.1.3

The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The Contractor and his personnel shall cooperate with personnel of BHEL, BHEL'S Customer, Customer's consultants and other Contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work of the project as a whole.

#### 11.1.4

The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, supervision, engineering and construction management. The Contractor should ensure proper planning and successful & timely completion of the work to meet the overall project schedule. The Contractor must deploy adequate quantity of tools & plants, modern / latest construction aids etc. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

#### 11.1.5

Contractor shall erect and commission all the equipments and auxiliaries as per the sequence & methodology prescribed by BHEL depending upon the technical requirements. Availability of materials and fronts will decide this. BHEL Engineer's decision regarding correctness of the work and method of working shall be final and binding on the Contractor. No claims for extra payment from the Contractor will be entertained on the ground of deviation from the methods / sequence adopted in erection of similar sets elsewhere.

#### 11.1.6

All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory/ local authorities are to be arranged by the Contractor at his cost in time to ensure smooth progress of work.

#### 11.1.7

The work shall conform to dimensions and tolerances specified in the various drawings / documents that will be provided during various stages of erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations due to Contractor's fault, the Contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by BHEL and recoveries will be effected from the Contractor's bills towards expenditure incurred including cost of materials and departmental overheads of BHEL.

# TECHNICAL CONDITIONS OF CONTRACT (TCC)

## Chapter-XI Erection Testing and Commissioning of ESP

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### 11.1.8

The Contractor shall perform any services, tests etc, which may not be specified but nevertheless, required for the completion of work within quoted rates.

### 11.1.9

All necessary certificates and licenses required for carrying out this work are to be arranged by the Contractor expeditiously.

### 11.1.10

The Contractor shall execute the work in the most substantial and workman like manner. The stores shall be handled with care and diligence.

### 11.1.11

BHEL reserves right to recover from the Contractor any loss which arises out of undue delay / discrepancy / shortage / damage or any other causes due to Contractor's lapse during any stage of work. Any loss to BHEL due to Contractor's lapse shall have to be made good by the Contractor.

### 11.1.12

All cranes, transport equipment, handling equipment, tools, tackles, fixtures, equipment, manpower, supervisors/engineers, consumables etc, except otherwise specified as BHEL scope of free issue, required for this scope of work shall be provided by the Contractor. All expenditure including taxes and incidentals in this connection will have to be borne by Contractor unless otherwise specified in the relevant clauses. The Contractor's quoted rates should be inclusive of all such contingencies.

### 11.1.13

During the course of erection, testing and commissioning certain rework / modification / rectification / repair / fabrication etc may become necessary on account of feed back / revision of drawing etc. This will also include modifications / re-works suggested by BHEL / customer / other inspection group. Contractor shall carry out such rework / modification / rectification / fabrication / repair etc promptly and expeditiously. Daily log sheets signed by BHEL engineer and indicating the details of work carried out, man-hours etc shall be maintained by the Contractor for such reworks. Claim of Contractor if any, for such works will be governed by relevant clauses of 'General Conditions of Contract'.

### 11.1.14

All works such as cleaning, leveling, aligning, trial assembly, dismantling of certain equipments / components for checking and cleaning, surface preparation, fabrication of structures, tubes and pipes as per general engineering practice and as per BHEL Engineer's instructions at site, cutting, gouging, weld depositing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scrapping, lapping, fitting up etc as may be applicable in such erection works and which are treated incidental to the erection works and necessary to complete the work satisfactorily, shall be carried out by the Contractor as part of the work within the quoted rates.

### 11.1.15

The Contractor shall make all fixtures, temporary supports, steel structures required for jigs & fixtures, anchors for load and guide pulleys required for the work. Contractor shall arrange necessary steel for such usage.

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### 11.1.16

The Contractor shall take delivery of the components, equipments, chemicals, and lubricants etc from the BHEL stores/ storage area after getting the approval of BHEL Engineer on standard indent forms of BHEL. Complete and detailed account of the materials and equipments after usage shall be submitted to the BHEL and reconciled periodically.

### 11.1.17

The distance between storage area and erection site is approx 1 TO 5 KM KM. Contractor shall plan and transport equipments, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the Contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, same shall be done by Contractor most expeditiously as incidental to work.

### 11.1.18

Plant materials should not be used for any temporary supports / scaffolding/ preparing pre-assembly bed etc.

### 11.1.19

The details of equipments to be erected under this contract are generally as per the schedule given in relevant appendices. These details are approximate and meant only to give a general idea to the tenderer about the magnitude of the work involved. Actual quantum and type of equipments will be based on the relevant erection documents which will be furnished to the Contractor in due course of erection and the weight and quantity as per the relevant engineering documents will only be admissible for the billing purpose.

### 11.1.20

Hangers & suspensions, supports etc for tubes, piping, & ducts etc will be supplied in running / random lengths / sizes which shall be cut to suitable sizes and adjusted as required.

### 11.1.21

Spring suspension / constant load hangers may have to be pre-assembled for required load and erection carried out as per instructions of BHEL. Adjustments, removal of temporary arrests/locks, cutting of excess thread length of hanger tie-rod etc have to be carried out as and when required. Load setting of spring hangers, as per BHEL's documents/instructions, during various stages of erection & testing and after floating of piping/ducting during cold and hot condition will have to be done as part of work. This exercise may have to be repeated till satisfactory results are achieved.

### 11.1.22

Layout of field routed/ small bore piping shall be done as per site requirement. Necessary sketch for routing these lines should be got approved from BHEL by the Contractor. There is a possibility of slight change in routing the above pipe lines even after completion of erection.

### 11.1.23

INSTALLATION AND WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, & MEASUREMENT DEVICES, WILL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE DONE AS PER THE

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INSTRUCTIONS OF BHEL SITE ENGINEER. THE INSTALLATION OF ALL THE ABOVE ITEMS WILL BE CONTRACTOR'S RESPONSIBILITY EVEN IF THE:

- I. ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.
  
- II. ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

### 11.1.24

Actuators/drives of valves, dampers, gates, powered vanes etc may have to be serviced, lubricated, before erection, during pre-commissioning & commissioning, including carrying out minor adjustments required as incidental to the work.

### 11.1.25

All electrical motors have to be tested for IR & PI values prior to the trial run. Where required, dry out may have to be carried out by using external heating source. Contractor shall make all arrangements in this regard and complete the work as instructed. BHEL will provide the motorized insulation testers.

### 11.1.26

In installation of various equipments it may become necessary to install these on temporary supports/ hanger due to various reasons including non-availability of suspension materials. Contractor shall install such temporary suspensions/hangers and later on shift the relevant equipments to their respective permanent hangers/ suspensions/ supports as incidental to work. Requisite materials for such temporary arrangements will be provided by BHEL on free - returnable basis which shall be returned to BHEL after the use.

### 11.1.27

The work shall be carried out strictly in accordance to the "Field Quality Plan" approved by BHEL/client. Contractor, jointly with BHEL, shall prepare all necessary records of measurements/readings/ protocols etc.

### 11.1.28

All works such as cleaning, levelling, aligning, trial assembly, dismantling of certain equipments / components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per the general engineering practice and as per BHEL engineers instructions at site, cutting, weld desposing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scraping, lapping, fitting up etc as may be applicable in such erection works and which are treated incidental to the erection work and necessary to complete the work satisfactorily shall be carried out by the Contractor as part of the work.

### 11.1.29

Interconnection/ hookup, if any, with the existing system shall form part of work. Such interconnections, hookups may require shut down of running plant and the relevant work have to be completed within such planned shutdowns. This may call for working with enhanced resources and on extended hours. Contractor's offer shall cover all such contingencies.

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### 11.1.30

Contractor shall regulate flow of material to and from site in such a manner and sequence that material accumulation at site does not lead to congestion at site. In case it is necessary to shift and restack the materials kept at work areas / site to enable other agencies to carry out their work or further any other reason, it shall be done by the Contractor most expeditiously. No claim for extra payment for such work will be entertained.

### 11.1.31

It may so happen that certain components like manhole doors, hanger etc may be supplied in loose items. They need to be assembled as per relevant drawings or as per advice of BHEL engineer prior to erection. This forms the part of the scope of work.

### 11.1.32

The Contractor shall have total responsibility for all equipment and materials in his custody at Contractor's stores, loose, semi-assembled, assembled or erected by him at site. He shall effectively protect the finished works from action of weather and from damages or defacement and shall also cover the finished parts immediately on completion of work as per BHEL engineer's instructions. The machine surfaces/finished surfaces should be greased and covered.

### 11.1.33

BHEL is operating web based computerized site operation management system (SOMS) that includes, inter-alia, issue of materials, daily progress reporting, Contractor's running monthly billing and material reconciliation through a computerized data management system. Contractor shall install necessary hardware to hook-up with the BHEL's system and use the same for his scope of work.

In the event the computerized SOMS is inoperative for any reasons, the Contractor shall take delivery of materials from the storage area/sheds of BHEL/customer after getting the approval of the engineer/customer on standard indent forms to be specified by BHEL/customer. All these records however shall be updated in the SOMS as and when the soms is reactivated/normalized.

### 11.1.34

Gases like argon, oxygen, acetylene etc that are required for erection related activities shall be arranged by the Contractor at his cost. For T-91 material site weld joints argon as per grade-3 of is 5760: 1998 with oxygen and water vapour restricted to max 6 ppm each and with argon purity level of minimum 99.99% shall be arranged and used by the Contractor. The supply should accompany test certificate for the batch indicating individual element 'ppm' level and overall purity level. We are not envisaging T-91 joints. However during erection, straight trays may be required to be modified suitably based on site condition required.

### 11.1.35

All lubricants and chemicals required for testing, preservation, chemical cleaning / acid cleaning, oil flushing, and the lubricants for trial runs of the equipments and trial operation of the unit will be supplied by BHEL free of charges.

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### DETAILS OF SCOPE OF WORK FOR ERECTION TESTING AND COMMISSIONING

The scope of work is further detailed in the specifications hereinafter.

#### **11.2 ERECTION OF ELECTROSTATIC PRECIPITATOR**

##### 11.2.1

Wherever called for, pre-assembly of supporting structures, casing walls, inlet outlet funnels, hoppers etc have to be done, on ground prior to erection in position.

##### 11.2.2

ALL SITE WELD FOR CASING, INLET & OUTLET DUCTING CONNECTIONS HAVE TO BE TESTED FOR ESTABLISHING LEAKPROOF JOINTS.

##### 11.2.3

Loading of collecting electrodes either from top or bottom, to be decided suiting site conditions, shall be done with due care as per instructions.

##### 11.2.4

Straightness of all collecting electrodes has to be checked on ground prior to loading in to the field.

##### 11.2.5

Bundle of collecting electrodes should be handled only with special lifting beam and slings supplied for the purpose.

##### 11.2.6

BHEL will supply Huck bolting M/c with necessary auxiliaries free of charges. However, electrical connections, operation etc shall be arranged by the Contractor.

##### 11.2.7

Clearances as prescribed amongst collecting electrodes and with casing walls have to be maintained. Spot heating of collecting electrodes, wherever called for, shall be done as part of work to achieve the required clearances.

##### 11.2.8

Erection, alignment/ fixing in final position, testing & commissioning of high voltage rectifiers of ESP is in the scope of work. **Filteration of Transformer Oil is in the Scope of Work if required. BHEL will Supply Filteration machine on Free of Charge if Required .**

##### 11.2.9

Installation of high voltage interlocks is in the scope of work.

##### 11.2.10

Complete erection, alignment, testing, pre-commissioning and commission etc for drive motors of collecting electrodes and emitting electrode rapping mechanism is in the scope of work.

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### 11.2.11 AIR LEAK TEST

After erection of ESP and before clearing for insulation, air leak test has to be carried out. Necessary equipment like, air blower, ventury and instrumentation etc. will be provided by BHEL free of charges. Handling at stores, transport, erection, commissioning and carrying out the leakage test, attending to the leakages till satisfactory sealing / leak proofness shall be in scope of the work. Contractor shall dismantle the test equipments and return to BHEL stores in good condition after due reconciliation, cleaning and servicing. No separate/ additional payment is envisaged for the above.

### 11.3 MAIN SUPPORTING STRUCTURES, EXTERNAL STRUCTURES, ELEVATOR STRUCTURES, STAIRWAYS, GALLERIES & PLATFORMS & HANDLING ARRANGEMENT

#### 11.3.1

Quality norms with regard to verticality of column, inter-alia, have to be adhered to strictly, at various stages of erection.

#### 11.3.2

Stiffening / strengthening of main supporting structure, if any, due to deviation in verticality of columns, shall be carried out, including fabrication, if any. Necessary steel for this will be provided in random sizes by BHEL as free issue. Payment for such stiffening/ strengthening shall be made for weight certified by BHEL engineer at the item rate applicable to structures, provided the deviation has occurred for the reasons not attributable to the Contractor.

If the deviations are attributable to Contractor, the materials required for Rectification / Stiffening / Strengthening, fabrication, erection of the same shall be to the Contractors account.

#### 11.3.3

It is likely that, in deviation from prescribed sequence, erection of certain elements of structure may be deferred for later stage, this may necessitate temporary installation of some structural steels at appropriate locations to keep the stability of structure intact. Such temporary installations shall be removed subsequently and returned to BHEL stores/ storage yard. Finishing work in the related permanent structures shall be done as per the instruction of BHEL engineer. BHEL will provide necessary steels on free issue basis in random sizes for such installations, which shall be fabricated by the Contractor to suit the requirement.

Payment for such installations shall be made on the accepted tonnage rate of structures. No separate payment will be made for fabrication, removal & return of the materials to BHEL stores.

#### 11.3.4

In some cases, the structural material will be supplied in random lengths, which have to be fabricated to suit the requirement as incidental to work. Also, it may sometimes be necessary to

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remove some of the erected members to facilitate erection of bigger/ pre-assembled equipments. In such cases, the removal and re-erection of such members as agreed by the BHEL Engineer will have to be done by the Contractor as incidental to work.

### 11.3.5

**Contractor shall arrange materials required for temporary cat ladders & working platforms** during erection of columns, platforms and other structural components. Such arrangements shall, as far as possible, be only of clamping & bolting type, as welding on columns etc will not be permitted. After the completion of work these shall be removed.

### 11.3.6

All the hand rails and toe guards shall be provided as per drawings and site requirement. hand rails supplied in running lengths shall be suitably cut, edge prepared and welded. Also, hand rails/ guards may have to be provided from the safety point of view in certain places though not indicated in the erection drawings. The weld joints of hand rails shall be ground smooth to flush finish.

### 11.3.7

Electroforged floor grills will be supplied for this project. These may have to be cut to suit requirement. Cutting shall be done only by mechanical cutters **and not by gas cutting**. Cold galvanizing compound is to be applied on the cut surface/edge. Cold galvanizing paint will be supplied by BHEL free of cost.

Fixing of floor grills shall be done by self-tapping screws **and not by weldable studs**. Special purpose electrically operated hand tools are available in the market for this, which drills, taps and fixes the screws in a single operation. BHEL will supply the necessary self-drilling-cum-tapping screws and fixing clips. Contractor shall deploy the **drilling cum fixing machine** required for this purpose as a regular scope of work.

**SIMILARLY ROOF SHEETING MAY HAVE TO BE FIXED WITH SELF-TAPPING SCREWS.**

### 11.3.8

The Contractor shall also install additional platforms of permanent nature for approaching different equipment as per the site requirement and to meet O&M requirements, though these may not be indicated in the erection drawings. Materials required for such platforms will be supplied by BHEL in random sizes on free issue basis. These have to be fabricated to suit the requirement. Payment only for erected weight as certified by BHEL engineer shall be made at the rate applicable for structures. No payment is envisaged for fabrication of structures.

### 11.3.9

All relevant provisions as above shall apply, mutatis-mutandis, to the work of external structures, interconnecting structures, elevator structures, ESP stairways and galleries & equipment handling system etc.

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### 11.4 OTHER PRODUCTS AND SYSTEMS AND COMMON REQUIREMENTS

- a) Ducts / expansion bellows (metallic & non-metallic) are normally supplied in loose components / segments and these are to be assembled and welded/ jointed at site before erection. The fabric portion of non-metallic expansion joints (NMEJ) namely bolster, fabric belt and canopy shall be installed by Contractor under supervision/guidence of equipment supplier/BHEL for the first few cases. Contractor shall ensure that all subsequent NMEJ are assembled with due care and proper procedure. In similar manner all joints, connecting ducts, expansion pieces and dampers shall be seal welded. These welds have to be made leak proof and tested as per technical instruction / requirement.
- b) Certain structural items like silencer supports, roof cladding structure, platform etc will be supplied in running lengths which shall be cut to required suitable sizes and adjusted/trimmed as part of work.
- c) Additional platforms of permanent nature for approaching different equipments, as per site requirement, which may not be indicated in drawings, shall be fabricated and installed by the contractor. Similarly canopies for motors, actuators etc may have to be erected. However, the contractor will be paid for this work on accepted tonnage rate for structures. BHEL will supply the material required for platforms/canopies in random lengths & sizes that shall be fabricated without any extra payment.
- d) Actuator / drives of dampers, gates etc may have to be serviced, lubricated before erection, during precommissioning and commissioning, including carrying out adjustments required as incidental of the work.
- e) All welded joints should be painted with anticorrosive paint / primer immediately after completion of all work. Necessary paints and other consumables for the above work are in the scope of the Contractor.
- f) Spring suspension / constant load hangers may have to be preassembled for required load and erection carried out as per instruction of BHEL adjustments, removal of temporary arrests / locks, cutting of excess thread length of hanger, tie rod etc, have to be carried out as and when required. Load setting of spring hangers, as per BHEL's documents / instructions, during various stages of erection and testing and after floating of piping / ducting during cold and hot condition will have to be done. This exercise may have to be repeated till satisfactory results are achieved.
- g) Hangers and suspensions, support steels for ducts and other equipments, piping etc will be supplied in running/random lengths/ sizes, which shall be cut to suitable sizes and adjusted as required.
- h) Touch up and preservative painting of all components issued to and/or erected by Contractor shall form part of scope of work. The Contractor shall arrange all paints, primer and consumables, T&P and facilities.

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### 11.5 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENT

#### 11.5.1

Building foundations and other necessary civil works for supporting structures, equipments etc will be provided by BHEL / Customer. The checking of dimensional accuracy, axes, elevation, levels etc, with reference to bench marks of foundations and anchor bolt pits have to be checked and logged by the Contractor. The permanent benchmark / reference marks will have to be transferred to new locations with sufficient care to maintain the accuracy and protected / preserved with adequate care (to enable rechecking at later dates) as per BHEL instruction.

Minor adjustment of foundation level, dressing and chipping of foundation surfaces and blue-matching (wherever required) for of all equipments as per BHEL Engineers instructions, should be done by the Contractor as part of the work. Contractor/BHEL shall prepare protocols before taking over the foundations. Dressing and chipping of foundations upto 35mm for achieving proper levels will be within the scope of work/specification.

#### 11.5.2

All temporary foundations and anchor points required for installing erection Equipments and winches, foundations for pumps, tanks etc are in the scope of Contractor. All building materials like cement, steel including re-inforcement bars, grits cements etc for such temporary foundations shall have to be arranged by the Contractor within the quoted rates. All such foundations shall be demolished and normal ground conditions restored after the usage.

#### 11.5.3

Contractor shall carry out scrapping and blue matching of embedded plates/ packers of rotating equipments. Chipping and the leveling of concrete surfaces, fine dressing up to the extent required to obtain contact between packer and concrete, is also covered in the scope of this work. Scrapping, chipping and matching shall be done so as to achieve prescribed percentage of contact between the two surfaces.

#### 11.5.4

BHEL will provide free of cost only the shims and packer plates (either machined or plain) which go as permanent part of the equipment. Certain packer plates and shims over and above the quantity received as a part of supplies from manufacturing units of BHEL will have to be cut out from steel plates / steel sheets at site to meet site requirement. Contractor shall cut and prepare packers and shims by gas cutting / chiseling / grinding and de-burr the same. However, machining of the packers wherever necessary shall be arranged by contractor.

#### 11.5.5

Complete grouting of structures equipments, including anchor/ foundation bolts, beneath base, base hollows etc, as may be applicable, is included in the scope of Contractor. Arranging all labour, building materials including cement, ordinary portland as well as quick setting – free flow - non-shrink grout mix (e.g. conbextra gp1/gp2), form work, shuttering, and any other requirements is in the Contractor's scope. Contractor shall obtain approval of BHEL for cement (Ordinary Portland as-well-as quick setting – free flow- non-shrink grout mix) prior to use. Cleaning of foundation surfaces, pocket holes and anchor bolt pits and de-watering and making them free of oil, grease, sand and other foreign materials by soda washing, water washing, compressed air and other approved methods are within the scope of this specification/ work.

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#### 11.5.6

After the grouting has finally set and cured, alignment of equipments involved shall be checked again to verify for any disturbance or any other reason. If required, de-coupling of equipments has to be done for conducting the verification. In case any disturbance is noticed the cause, if any, shall be removed and re-alignment done as part of work.

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### **11.6 WELDING, RADIOGRAPHY AND OTHER NON-DESTRUCTIVE TESTING, POST WELD HEAT TREATMENT**

#### **11.6.1 WELDING**

##### 11.6.1.1

Installation of equipment involves good quality welding, NDE checks, post weld heat treatment etc. Contractor's personnel engaged should have adequate qualification on the above works.

##### 11.6.1.2

The method of welding (viz) arc, TIG or other method will be indicated in the detailed drawing/documents. BHEL Engineer will have the option of changing the method of welding as per site requirement.

##### 11.6.1.3

Before any welder is engaged on work, he shall be tested and qualified by BHEL/ customer, though they may possess the IBR/other certificate. BHEL reserves the right to reject any welder without assigning any reason. All the expenditure in testing/qualification of the Contractor's welder shall be borne by Contractor.

##### 11.6.1.4

Unsatisfactory and continuous poor performance may result in discontinuation of concerned welder.

##### 11.6.1.5

The welded surface shall be cleaned of slag and painted with primer paint to prevent rusting, corrosion. For this consumables like paint /primer etc will be in the Contractor's scope.

##### 11.6.1.6

The Contractor shall maintain welding records in the form as prescribed by BHEL containing all necessary details, and submit the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability of the welds shall be final.

##### 11.6.1.7

Joint fit up will be a stage of inspection. Where required, joints shall be offered for visual inspection after root run. Subsequent welding should be made only after the approval of root run.

#### **11.6.2 SOCKET WELDING**

In execution of this work, considerable number of socket weld joints is involved. The exact quantity of such socket welds or probable variation in the quantum cannot be furnished. The tenderer shall take notice of this while quoting as no extra claim on this account will be entertained.

##### 11.6.2.1

Welding electrodes have to be stored in enclosures having temperature and humidity control arrangements. This enclosure shall meet BHEL specifications.

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### 11.6.2.2

Welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the welding electrodes have to be carried in portable ovens.

### 11.6.3 HEAT TREATMENT:

#### 11.6.3.1

For the purpose of temperature recording of stress relieving process wherever applicable, thermocouples have to be attached to the weld joint. The number of temperature measuring points and locations shall be as per the standards of BHEL. Thermocouples have to be attached using capacitor discharge type portable thermocouple attachment unit. Contractor shall arrange sufficient number of thermocouple attachment units.

#### 11.6.3.2

Contractor should provide temperature indicator / temperature recorder for measuring temperature during pre-heating for welding or for controlling temperature of metal for hot correction etc. The temperature recorders should be preferably of solid state type.

#### 11.6.3.3

Heat treatment may be required to be carried out at any time (day or night) to ensure the continuity of the process. The Contractor shall make all necessary arrangements including labourer required for the same as per directions of BHEL.

#### 11.6.3.4

In certain cases only the pre-heating of weld joints may be called for.

#### 11.6.3.5

For weld joints of heavy structural sections, if heat treatment is required, the same shall be carried out as part of the work.

#### 11.6.3.6

Checking effectiveness of stress relieving by hardness tests (by digital hardness tester or other approved test methods as per BHEL Engineer's instruction) including necessary testing equipments is within the scope of the work / specification.

#### 11.6.3.7

All the recorded graphs for heat treatment shall be handed over to BHEL/ IBR authorities and due clearances obtained.

#### 11.6.3.8

Results of these processes shall be verified/ validated as per requirements of BHEL/client.

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### 11.6.4 NON DESTRUCTIVE EXAMINATION:

#### 11.6.4.1

Contractor shall provide all resources and make all arrangements for the radiographic examination of welds for this work for reasons of safety; invariably the radiography work will be carried out after the normal working hours and close of other site activities only. In this regard, the Contractor has to adhere to the safety rules / regulations laid by barc authorities from time to time.

#### 11.6.4.2

Radiography inspection of welds shall be performed in accordance with requirements and recommendation of BHEL Engineer. The minimum quantum of radiographic inspection shall be as per provision of IBR/BHEL's erection documents. They may, however be increased depending upon the performance of the individual welder at the discretion of BHEL Engineer/Boiler inspecting authority. Bidder shall also arrange the UT equipment with recording facility at his own cost. Usage of UT equipment shall be as per direction of BHEL engineer. Records of UT shall be produced as per site requirement.

#### 11.6.4.3

All X-Ray / Gamma Ray films of weld joints shall be preserved properly and be handed over to BHEL/ IBR authorities and requisite clearances shall be obtained by the Contractor.

#### 11.6.4.4

The field welded joints shall be subject to Dye-penetrant/MPT/RT/ other non-destructive examination as specified in the respective engineering documents/ as instructed by BHEL.

#### 11.6.4.5

Wherever required, surface preparation, like smooth grinding of welded area, prior to Radiography shall be done. It may also become necessary to adopt inter-layer radiography/MPT/UT depending upon the site/ technical requirement necessitating interruptions in continuity of the work and making necessary arrangements for carrying out the above work. The Contractor shall take all this into account in his offer. The required NDT method/procedure will be decided by BHEL engineer at site.

#### 11.6.4.6

Tenderer shall note that 100% radiography shall be taken on all high pressure welding till such time the welders' performance is found by BHEL Engineers to be satisfactory. Subsequently, subject to consistency in welder's performance, the percentage of radiography will be based on BHEL's standard practice/code requirement. The defects shall be rectified immediately and to the satisfaction of BHEL engineer. The decision of BHEL engineer regarding acceptance / rejecting the joints will be final and binding on the Contractor.

#### 11.6.4.7

100% radiograph of certain sizes in piping have to be taken as per BHEL standards/ drawings. Major piping involved is for water wash line, Roof drains ,transfer oil drainages etc.

#### 11.6.4.8

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For carrying out ultrasonic testing of welding joints of large size tubes and pipes, it will be necessary to prepare surface by grinding and buffing a smooth finish and contour as necessary. The Contractor's scope of work includes such preparation as incidental to work.

#### 11.6.4.9

Contractor may have to undertake radiography with cobalt-60 isotope camera in certain cases. However, for any reason if use of Cobalt-60 is not possible then these joints shall be checked by radiography after completion of welding up to suitable part of thickness with IR-192 other suitable source subsequently after completing the joint UT to be done. For this Contractor has to deploy level-II operator certified by BARC.

#### 11.6.4.10

No separate payment for any NDE activities (including radiography) will be made.

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# (ELECTRICAL)

## 11.7 Electrical & C&I works

Erection and Commissioning of all electrical and C&I Supplied items of ESP in the scope of supply of BHEL Units for this project like control room inserts, cables, earthing, cable trays, junction box, heating elements, interlocks, auxiliary control panel, rapper control panel, statcon panel, LT switch board, ESP switch gear, Bapcon and Accessories, opacity monitor and accessories, ash level indicators etc, is in the scope of work.

### 11.7.1 Installation of Cable trays/cable ducts

**11.7.1.1** Various types of sheet metal, galvanized cable tray, i.e. Perforated, ladder type, seal metal duct, solid bottom tray, shall be provided in standard lengths along with accessories like hardware, bends, reducers, coupler plate, tray covers and tray clamps etc.

#### 11.7.1.2

Installation of cable tray/cable duct shall include cutting, laying, jointing, supporting, drilling holes in the support, providing tees/reducers/bends/clamps as per tray route layout, fabrication of bends/tees/reducers from straight length, fixing of tray covers, welding of tray on support, cleaning and application of cold galvanizing paint on weld joints (supply of paint is in the scope of contractor). Installation of tray/duct covers, wherever provided, will be done as a part of tray erection and no extra rates will be payable.

#### 11.7.1.3

In case cable trays are required to be fabricated from structural steel and installed no separate rate shall be paid for fabrication, however erection payment shall be made as per rate finalized for ESP erection.

#### 11.7.1.4

Cable trays/ducts have to be routed underground in cable trench, over head on structure, valves, floors etc. for various applications such as cable laying, copper tubes, conduits, thermocouple, temperature gauge capillary etc.

#### 11.7.1.5

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Installation of Copper tubes/SS tubes/copper pipes shall include cutting into required length, laying, bending, cleaning, brazing wherever required, fixing of brass fittings like compression fittings/tees/end connectors/straight connectors/bulk heads/valves etc., supporting clamping including supply of clamps and hardware, flushing and conducting leak test.

#### **11.8 Cable laying (power / control / instrumentation shielded / unshielded cables / plug-in cables / coaxial / UTP / STP / data highway, armoured / un-armoured, single / multi-core, PVC/HR PVC/FRLS/TEFLON/XLP insulation, optical fibre)**

##### **11.8.1**

Cable laying includes cutting to the required length, laying in overhead/underground cable trench/through pipes/flexible conduits, dressing/clamping in tray, drilling of holes in gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JBs, providing PVC numerical/alphabetical / printed ferrules, termination by using crimp type copper tinned/aluminium lugs, insulated/un-insulated, termination (crimp, soldering, etc.), plug-in connections with insert type crimping, providing identification PVC/aluminium cable tags (at both the ends and at 15 m intervals throughout the route length and also at each bend), continuity checking, insulation resistance checking, high voltage test on HT cables.

Laying, etc of Optical fibre cables on cable trays /cable trench shall necessarily be done using flexible conduit

##### **11.8.2**

Entry to the panels and JBs may be at top, sides or bottom. All cables are required to be properly supported and clamped near to the JB/panel.

##### **11.8.3**

Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, prefab plug-in cables, etc., for such cases cables may have to be lifted inside the panel by either making cut-out in gland plate and providing rubber profile for sharp edge protection or alternatively, providing 4" or 6" PVC pipe coupling gland and these pipe coupling gland shall be supplied by contractor within the quoted rate of cable laying.

##### **11.8.4**

Copper tinned lugs of various types (pin, ring, fork, snap-on) upto 4 sq.mm, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/metallic,

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clamping and dressing material with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. The quality of material shall be got approved from BHEL engineer prior to their use on job.

#### **11.8.5**

All care should be taken to avoid abrasion, tension, twisting, kinking, stretching of cables during installation.

#### **11.8.6**

Cable shielding – all signal cables are supplied with bare shielded copper wire/with braided wire shield. Generally shield wire is kept isolated at instrument/field device end and continuity is maintained through JBs and grounded at panel end only. While terminating the shield wire either in panel or JBs, PVC sleeves are to be used to avoid two-point earthing.

#### **11.8.7**

Wherever cables run through ducts, conduits, valves, etc., they shall be sealed using fire/weather proof compound. In addition to this, cable entry in panels, MCCs, instruments, electrical actuators etc., are also required to be sealed. The required material for doing so shall be included by contractor in the cabling scope.

#### **11.8.8**

Many of the cable trays and cables have to be laid in cable trenches. For this purpose, the cover of the trenches have to be opened for working in site and whenever the cables are to be laid in existing cable tray, all safety precautions have to be observed.

After completing the work, the trenches have to be cleaned and covers put back into position. Contractor shall also carry out de-watering from the trenches if required and arrange pumps etc., at his cost.

#### **11.8.9**

Looping wire at terminal block of panels and electrical actuator as shown in the inter-connection diagrams or as required is to be done by contractor at no extra cost.

#### **11.8.10**

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Contractor shall carefully plan the cutting schedule of each cable drum in consultation with site engineer such that wastage are minimized.

#### **11.8.10.1**

The erection contractor shall make every effort to minimize wastage during erection work. In any case, the wastage shall not exceed the following limits;

<b>SI No.</b>	<b>Item</b>	<b>% Wastage on issued Qty</b>
1.	Fabrication steel	2
2.	Each size of power cables	1
3.	Each size of control/Inst cables	2
4.	Impulse pipe/tubes/GI pipes/copper tube	1

If however, the bidder quotes for more wastage than specified above, the excess portion will be considered for adjustment during the tender evaluation at the quoted supply rate of material.

If the actual wastage be more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill.

#### **11.9 Junction Boxes :**

Different types of junction boxes are to erected by the contractor like junction boxes below 48 ways and above 48 ways. The junction boxes are to be located at the locations jointly decided at site during erection. The junction boxes are to be erected on the frames fabricated at site.

#### **11.10 Installation of panels**

##### **11.10.1**

Electrical control panels, electronic control panels, etc., are normally supplied in suit of either one/two/three or loose shipping sections with integral base frame or loose supplied.

These panels may have to be installed as stand alone or in groups consisting of number of panels in each row, depending upon the plant layout and foundation arrangement.

##### **11.10.2**

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Installation of panel shall include fixing of base frame, fabrication of base frame if required, levelling, alignment, fixing of anti-vibration pads, removal of side covers, fixing of cubicle interconnection hardware, bus bar jointing, wiring interconnection, welding and grouting of panels and base frames, mounting of panel canopy wherever supplied as part of panel, drilling of gland plates and sealing of cable entries. In certain case where canopies are not supplied but have to be fabricated out of MS sheets provided by BHEL, no separate rate shall be paid for fabrication however erection payment shall be made as per rate finalized for ESP erection.

#### **11.10.3**

Panels have to be shifted to their locations through floor openings, temporary openings like floor grills, door etc. which shall be part of work and no claim whatsoever will be entertained with regard to non-availability of opening as per shortest route etc. Panels have to be erected at different locations and elevation in ESP control room etc.

#### **11.10.4**

Panel and instruments once erected in position should be properly protected using necessary care to prevent ingress of dust/moisture. This will have to be periodically cleaned and surroundings have to be kept tidy.

#### **11.10.5**

Wherever the panels to be mounted on cable trenches, channel supports have to be provided across the cable trench over which the base frame of panel shall be mounted. For such work, structural steel fabrication, installation rates shall be applicable.

#### **11.10.6**

Normally the panels shall be supplied with instruments, relays, meters, electronic modules etc. mounted and pre-wired. However, if these are supplied loose / separately for safety in transit, contractor shall mount/wire such devices as part of the panel installation work and no separate rates shall be applicable for this. Unless otherwise specially listed in the rate schedule.

#### **11.10.7**

No separate payment shall be made for replacement of any devices like electronic modules, relays, conductors, terminal block, push buttons etc. which are found defective during pre-commissioning / post-commissioning of any equipment / item.

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#### **11.10.8**

For the panels erected by other agencies, commissioning/calibration work and trouble shooting has to be carried out by the contractor as part of testing and commissioning work as per the quoted rates.

#### **11.10.9**

Minor civil works like drilling, chipping, punching holes and opening in concrete floors, slabs and brick walls, grouting, related to Rack, support installation, minor civil works required for installation of control panels, Junction boxes etc., shall be included in the erection cost of such items. Also all miscellaneous civil works like chipping away and making good as necessary in floor slab/wall for cabling / earthing etc., as required are included in the scope for which no separate payment is applicable. The scope also includes supply of grouting material, if any.

#### **11.10.10**

Supplier's instruction manuals, packing slips, door keys etc. received along with the panels should be promptly handed over to BHEL's engineer on opening of the panels.

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### 11.11 LINING AND INSULATION

Application of insulation, finishing, cladding and outer casing etc for ESP:

#### 11.11.1

The work shall conform to dimension and tolerances specified in the various drawing and documents that will be provided during the execution. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications, the Contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by engaging other agencies or departmentally and recoveries will be deducted from Contractor's bills towards expenditure incurred including 30% departmental charges.

#### 11.11.2

The terminal points as decided by BHEL shall be final and binding on the Contractor.

#### 11.11.3

All insulation and refractory materials including iron components and outer sheet casing materials, cladding sheets etc required will be supplied by BHEL and the same have to be erected/ applied as per the drawings and specifications of BHEL by the Contractor.

#### 11.11.4

The Contractor shall provide all the necessary scaffolding materials, temporary structures and necessary safety devices etc, during all stages of work. Scaffolding materials (poles, gratings etc) shall be of light weight construction. Contractor shall arrange steel pipes & clamps with accessories like base plate attachment, fixing pins, struts etc for scaffolding required for this work. However, BHEL's decision in this regard shall be final and binding. Contractor shall arrange the scaffolding materials in sufficient quantity.

The Contractor shall provide the required quantity of wire, nails, and planks for formwork and other materials for shuttering and curing works.

#### 11.11.5

Contractor shall observe all precaution for laying, curing etc of pourable insulation. The Contractor at his own cost shall redo any defective works found.

#### 11.11.6

Wool insulation is received at site as loose bonded mattresses in standard sizes. These are to be dressed/cut to suite the equipments. Multiple layers of wool have to be applied as directed and as per drawings and specifications for all equipments/ systems covered under the scope of work.

#### 11.11.7

Cutting & dressing of insulation bricks to suit the site area of application is incidental to work.

#### 11.11.8

Removable type of insulation has to be provided for valves fittings, expansion joints etc as per drawing or as directed by BHEL Engineer.

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### 11.11.9

The cladding and outer casing are aluminium sheets. All relevant specifications and procedures with regards to beading, sealing etc for aluminium sheets have to be adhered to.

### 11.11.10

Cladding/outer casing shall be fixed expeditiously, so as to avoid damage to the insulation from the weather.

### 11.11.11

The overlapping surface of outer casing/cladding sheet shall be coated with sealing compound, **Sealing Compound will be Supplied by Contractor**

### 11.11.12

To take care of bimetal corrosion due to variety of metals in contact of each other viz retainer to support, support to outer casing/cladding, cladding-to-cladding etc, suitable paints specified by BHEL, to be applied and/or neoprene rubber packing/strips or any other insert may have to be fixed as required.

### 11.11.13

The Contractor shall leave certain gaps and openings while doing the work as per the instructions of BHEL Engineer to facilitate inspection by boiler inspector or during commissioning to fix gauges, fittings, instruments etc. these gaps will have to be finished as per drawings at later date by the Contractor at his cost.

Contractor shall cut open works in needed as per BHEL Engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over without any extra payment.

### 11.11.14

A log book shall be maintained by the Contractor for the clearance of the area for application of refractory and insulation. Where the Contractor does the work on his own accord without prior permission, the work should be re-done, at his own cost, where necessitated.

### 11.11.14

Wastage allowances for the material issued are envisaged as follows:

➤ a	Pourable & castable insulation	-	2%
➤ b	Insulation bricks and mortar	-	2%
➤ c	Wool mattresses	-	2%
➤ d	Cladding sheets	-	2%

The wastage allowance will be applicable on the net issued quantity i.e. total quantity issued reduced by the quantity returned to stores as unused/fresh item. Contractor shall reconcile the material issues periodically as prescribed by BHEL site. Payment for the done will be regulated as per provision of **Chapters VII**.

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11.11.15

The following works are also included in the scope of this contract.

Cutting of cladding sheets as per the profile of the equipment and painting on inner surface two coats of bituminous paint. Paint will be supplied by Contractor.

Cutting of the wool mattresses in the required shape and application of finishing cement of required thickness wherever required.

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### 11.12 PAINTING

#### 11.12.1

All exposed metal parts of the equipment including piping, structures, railings etc. wherever applicable, after installation unless otherwise surface protected, shall be first painted with at least one coat of suitable primer which matches the shop primer paint used, after thoroughly cleaning all such parts of all dirt, rust, scales, greases, oils and other foreign materials by wire brushing, scraping or sand blasting, and the same being inspected and approved by BHEL engineer for painting. Afterwards, the above parts shall be finished with two coats of alloyed resin machinery enamel paints.

#### 11.12.2 Touch-up painting on damaged areas -

- a) For coatings damaged up to metal surface

Surface preparation shall be carried out by manual cleaning. minimum 6 inches adjoining area with existing coating shall be roughened by wire brushing, emery paper rubbing etc., for best adhesion of patch primer.

Primer coat of touch-up primer to be applied by brush immediately after the surface preparation.

Over this primer coat, finish coat and final finish coat shall be applied as covered above by brush within maximum seven (7) days of application of touch up primer.

Tentative Painting scheme is enclosed for information at **Annexure-III**. However, for execution only the latest document shall be applicable and no claim whatsoever shall be entertained in case of any variance between such documents. Similarly, documents as provided progressively during the execution of work for all other products/ equipments etc shall be applicable.

#### 11.12.3

Painting of welded areas / painting of areas exposed after removal of temporary supports / touch-up painting on damaged areas of employer's structures, where inter-connection, welding / modification etc. has been carried out by the bidder.

- (a.) clean the surface to remove flux spatters and loose rust, loose coatings in the adjoining areas of weld seams by wire brush and emery paper.
- (b.) painting procedure to be followed as mentioned above for touch-up painting on damaged areas.

#### 11.12.4

The scope of work includes painting of colour bands, lettering, marking and signs for direction of flow/rotation, names etc of approved colours as per the standard colour codes and specifications specified in tender specification or as advised by BHEL/customer engineer at site for the equipments/ components covered in these specifications.

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#### 11.12.5

All exposed metal parts of the equipment including piping, structures, hand railing, grating etc shall be thoroughly cleaned off dust, rust, scales and other foreign materials by manual or mechanised wire brushing, scrapping, sand blasting etc and the same being inspected and approved by BHEL/customer engineer before application of primer. Afterwards, the above parts shall be finish painted with specified number of coats as per specification.

#### 11.12.6

In certain isolated instances where it is not possible to clean the equipments as explained above, cleaning by grinding might have to be resorted to. No damage to the equipment/components should be caused.

#### 11.12.7

Surface to be painted should be free of oil and grease. It should be removed by using suitable cleaning agents including permitted solvents. Surface cleaned by chemical agent, if required, shall be treated further as prescribed in use of such cleaning agents. The Contractor at his own cost shall provide all the consumables and application implements.

#### 11.12.8

During the preparation of surface, if the shop coat is damage by chemical cleaning or by mechanical means, Contractor shall repair the same free of cost to BHEL.

#### 11.12.9

Specified drying time shall be permitted from one to another coat.

#### 11.12.10

This work requires working at higher altitudes from ground level to as high as 30 m and more. The work spread is also substantial involving substantial run of structures and piping. Contractor shall take sufficient precautions to avoid any accident and hazard in all respects. The ropes, ladders, scaffolding materials, clamps etc and climber used should be of standard quality for safe and smooth execution of work.

#### 11.12.11

Contractor shall carry out the work in such a way that other erected equipment, structure, civil foundations and other property are not damaged. For damages in any of such cases due to lapses by Contractor, BHEL shall have the right to recover the cost of such damages from the Contractor.

#### 11.12.12

Contractor shall take due care to cover/protect the equipment which are already painted while carrying out the painting of other adjacent equipment. If so happens, it shall be cleaned and repainted by the Contractor without any extra charges.

#### 11.12.13

In general, painting of structural parts and colour bands, lettering, marking of direction of flow/rotation etc will be carried out by brush painting. However, areas/equipments inaccessible for manual painting have to be painted by spray painting. The decision of BHEL engineer, in this regard, shall be final and binding on the Contractor. For the purpose of spray painting, air at one point will be made available by BHEL free. Laying of air hose pipe and any other line

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required shall be done by Contractor at his cost. The Contractor shall provide spray equipment set.

#### 11.12.14

The Contractor shall provide all the necessary scaffolding materials, temporary structures and necessary safety devices etc, during execution of the work.

#### 11.12.15

Final painting work shall be started after obtaining clearance from BHEL engineers and as per his instructions.

### **11.13 PRIMER AND PAINTS FOR FINAL PAINTING**

Supply of all primer and paints required for final painting as per specification provided by BHEL shall be in the scope of Contractor. Contractor shall obtain approval from BHEL prior to procurement.

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### 11.14 TESTING, PRE-COMMISSIONING, COMMISSIONING

#### 11.14.1

Testing, pre-commissioning & commissioning will involve, though not limited to these, various testing, trial runs of various equipments erected and systems installed. All the activities for commissioning of the set, as informed by BHEL from time to time shall be completed.

#### 11.14.2

All these tests should be repeated till all the equipments satisfy the requirement / obligations of BHEL to their client and also the relevant statutory authority.

#### 11.14.3

Contractor shall lay / install necessary temporary piping, pumps, valves, blanks, gauges, cables, switches etc for conduct of hydraulic / pressure test, chemical cleaning, steam / air blowing etc. this may involve cutting of some portion of existing piping / valves, placing of rubber wedges / blanks in the valves and other openings, fabrication and installation of temporary tanks for chemical mixing, temporary access platforms to mixing tanks etc. Where required, bends have to be fabricated / formed at site from random length / size of pipes / structural steel. Temporary installation itself has to be tested, tried, and subject to non-destructive examinations as per the instructions of BHEL as part of work.

No payment will be made for temporary installations made for hydraulic testing of various systems & piping. Similarly no payment will be made for electrical installations made for any temporary system.

#### 11.14.4

All materials, equipments necessary for installation of temporary system as above will be supplied by BHEL as free returnable issue in random sizes / lengths. However, servicing, fabrication, erection, dismantling of the same after completion of the process, and handing over back to BHEL stores will be the responsibility of the Contractor.

In accounting of materials following wastage allowances are provided:

1. Structural items	:	5%
2. Pipes	:	3%

No wastage allowance for valves & other equipments.

#### 11.14.5

Overhauling, cleaning, servicing of tanks, pumps, equipments, valves, during erection and commissioning stages are in the scope of work. Gaskets, packing & spares for replacement will be provided free of charges by BHEL.

#### 11.14.6

During trial runs/ tests, pre-commissioning / commissioning, replacing / changing mechanical / other seals of equipments like pumps, removal and cleaning / replacing of filters etc is within the scope of work. Replacement spares for this purpose will be provided by BHEL.

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#### 11.14.7

In case any defect is noticed during tests, trial runs of all equipments and their auxiliaries, such as interferences, rubbing, loose components, abnormal noise or vibration, strain on connected equipment etc the Contractor shall immediately attend to these defects and take necessary corrective measures. Readjustment and/or realignment, if necessary, shall be done as per BHEL engineer's instructions. Claim, if any, for these works shall be governed by **Section-13, special conditions of contract provided the cause of such work is not attributable to the Contractor.**

#### 11.14.8

- ✓ Contractor shall cut / open / dismantle work, if needed, as per BHEL Engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over.
  
- ✓ Similarly, during the course of erection, if certain portion of equipments erected by the Contractor has to be undone for enabling other Contractors / agencies of BHEL / customer to carry out their work, Contractor shall carry out such jobs expeditiously and promptly and make good the job after completion of work by other Contractors / agencies of BHEL / customer as per BHEL engineer's / agencies of BHEL / customers instructions. Claims, if any, **in this regard shall be governed as per clauses in Section-13 herein.**

#### 11.14.9

During this period, though BHEL/ client's staff will also be associated in the work, the Contractor's responsibility will be to arrange for complete requirement of men and required tools and plants, consumables, scaffolding and approaches etc till such time the commissioned unit undergoes trial operations.

#### 11.14.10

Commissioning activities will continue till the completion of trial operation. During this period Contractor shall make available the services of separate dedicated workforce comprising of suitable skilled and semi-skilled / un-skilled workmen and supervisory staff alongwith necessary tools and plants, consumables etc.

#### 11.14.11

It shall be specifically noted that the Contractor may have to work round the clock during the pre-commissioning and commissioning period alongwith BHEL Engineers and hence considerable overtime payment is involved. The Contractor's quoted rates shall be inclusive of all these factors.

#### 11.14.12

The Contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the Contractor.

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#### 11.14.13

At various stages of completion ESP has to be preserved against corrosion either by wet preservation or by dry preservation as per the requirement of BHEL Engineer. Contractor shall carry out the entire incidental jobs.

During this period, though BHEL/ client's staff will also be associated in the work, the Contractor's responsibility will be to arrange for complete requirement of men and required tools and plants, consumables, scaffolding and approaches etc., till such time the commissioned unit is taken over.

#### 11.14.14

Conducting of performance guarantee test is in the scope of work. Contractor shall install all necessary tapping points; instruments etc and provide necessary assistance in this regard.

In case PG test is getting delayed beyond the contract period (normal plus extension if any) due to reasons not attributable to the Contractor, PG test issue will be mutually discussed and decided. However installation of necessary tapping points, impulse pipes, approaches etc are to be completed by the Contractor.

#### 11.14.15

The Contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the Contractor.

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### 11.15 PRESERVATION & PROTECTION OF COMPONENTS

At all stages of work, equipments/materials in the custody of Contractor, including those erected, will have to be preserved as per the instructions of BHEL. Necessary preservation agents including the primer & paint, for the above work shall be provided by the Contractor.

#### 11.16

The Contractor shall make suitable security arrangements including employment of security personnel and ensure protection of all materials/ equipment in their custody and installed equipments from theft/fire/pilferage and any other damages and losses.

#### 11.17

Contractor shall collect all scrap materials periodically from various area of work site, deposit the same at one place earmarked at site or shift the same to a place earmarked in BHEL/ client's stores. In case of failure of Contractor in compliance of this requirement, BHEL will make suitable arrangement at Contractor's risk and cost.

#### 11.18

The entire surplus, damaged, unused materials, packaging materials / containers, special transporting frames, gunny bags, etc shall be returned to BHEL stores by the Contractor.

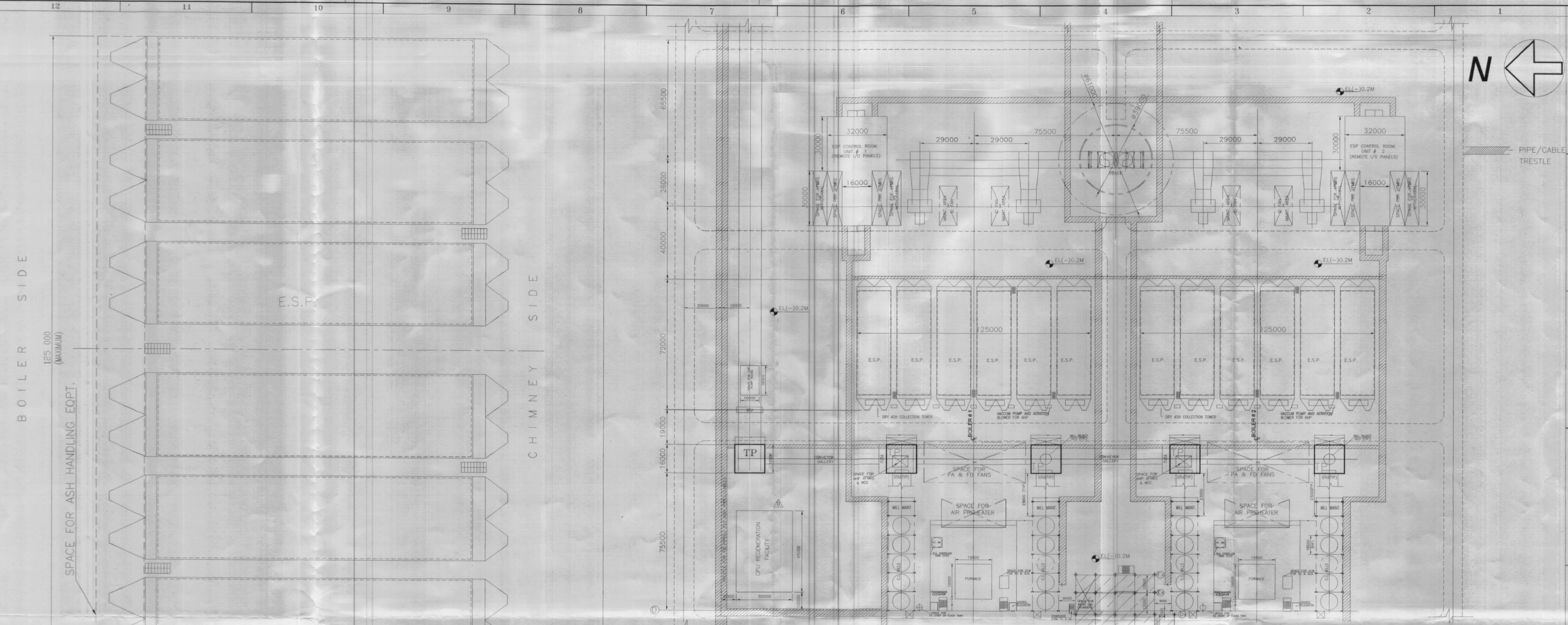
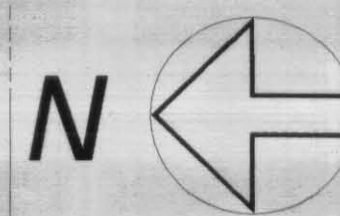
#### 11.19

The Contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/excess utilisation of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be effected with departmental charges from the Contractor. Decision of BHEL on this will be final and binding on the Contractor.

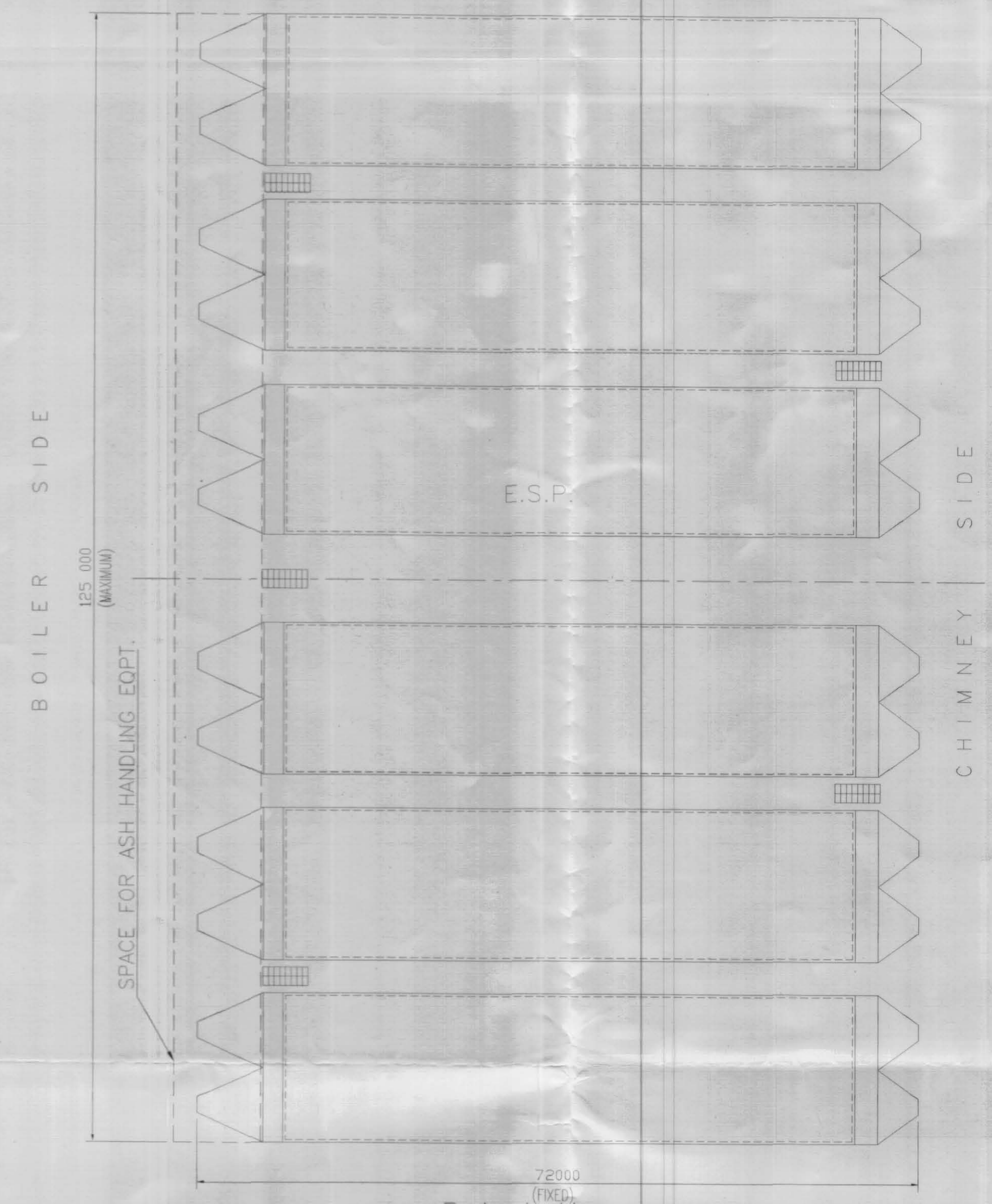
#### 11.20

For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL.

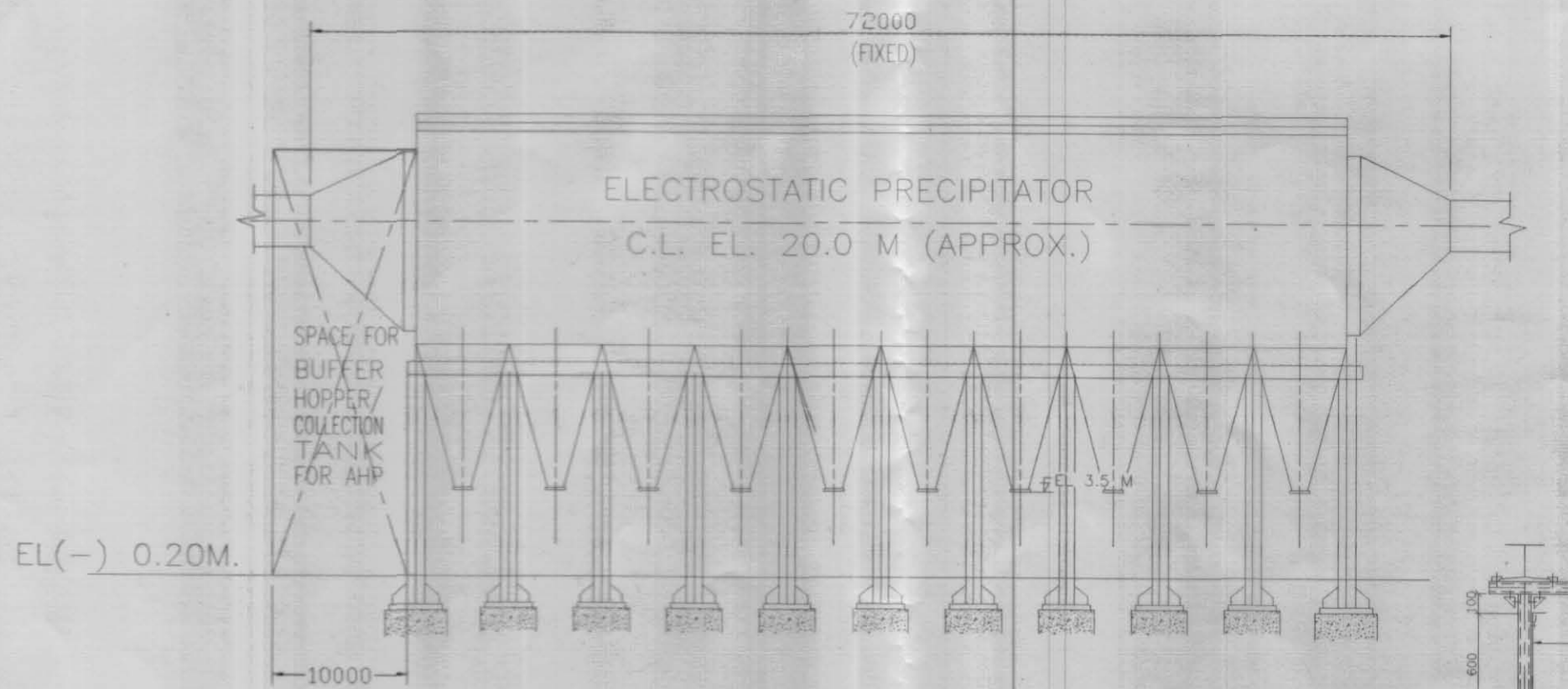
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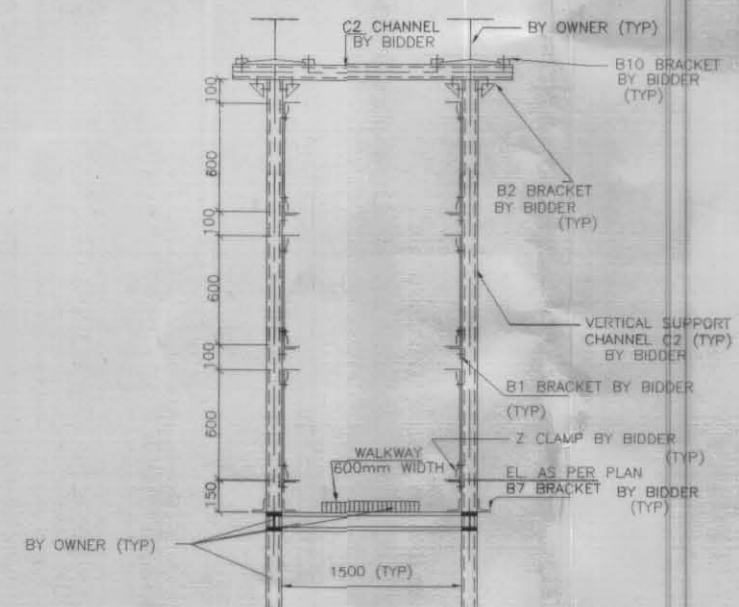
**KEY PLAN**



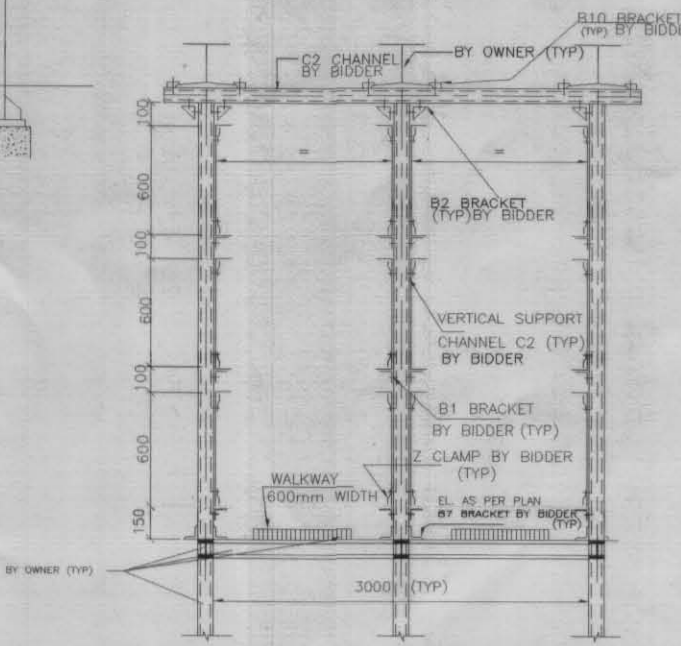
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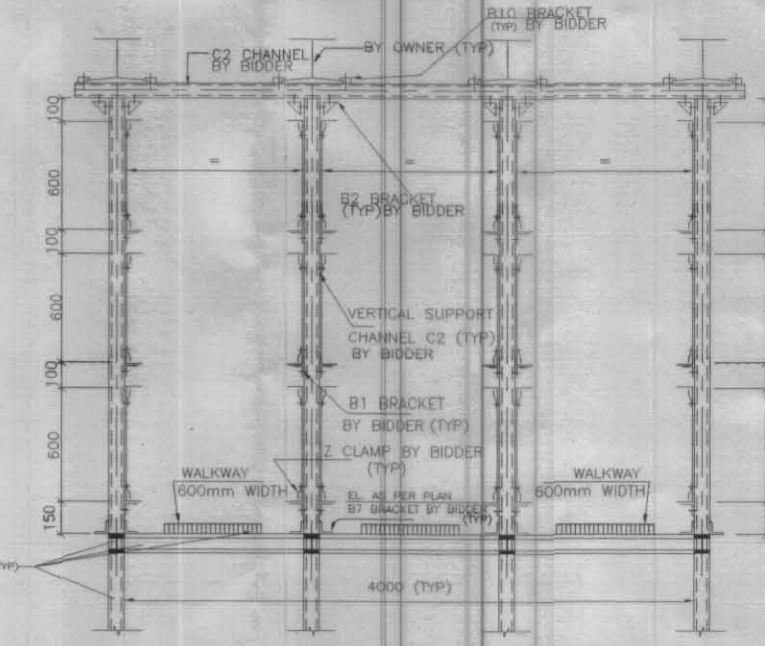
**ELEVATION**



TYP. SECTION OF CABLE TRAY ARRANGEMENT (UPTO 4 NOS)  
TRAYS & IT'S SUPPORTING ARRANGEMENT TO BE PROVIDED BY BIDDER



TYP. SECTION OF CABLE TRAYS ARRANGEMENT (UPTO 12 NOS)  
TRAYS & IT'S SUPPORTING ARRANGEMENT TO BE PROVIDED BY BIDDER



TYP. SECTION OF CABLE TRAYS ARRANGEMENT (UPTO 18 NOS)  
TRAYS & IT'S SUPPORTING ARRANGEMENT TO BE PROVIDED BY BIDDER

**NOTES**

1. THE LENGTH OF THE ESP SHOWN IN THE PLAN AND ELEVATION IS FIXED FOR ESP VENDOR, HOWEVER WIDTH OF ESP SHOWN IN THE DRG. IS MAXIMUM.
2. THE CENTRE LINE ELEVATION OF ESP INLET AND OUTLET DUCT INDICATED ARE TENTATIVE AND SHALL BE MATCHED BY ESP VENDOR WITH THE DUCT ELEVATIONS OF STEAM GENERATOR.
3. LOCATION OF ESP CONTROL ROOM IS AS SHOWN IN THE KEY PLAN.
4. MINIMUM NUMBER OF STAIR CASES SHALL BE FIVE(5) PER ESP OF EACH UNIT. THE MINIMUM CLEAR WIDTH OF THE STAIRCASE SHALL BE 1200mm.
5. BOTTOM FLANGE ELEVATION OF ESP HOPPERS SHALL BE EL 3.5M.(MINIMUM).
6. WIDTH OF ESP MAINTENANCE PLATFORM SHALL BE AS PER TECHNICAL SPECIFICATIONS.
7. TOP OF STIFFNER PLATES PROVIDED ON THE ESP COLUMNS SHALL BE 200mm BELOW THE FINISHED FLOOR LEVEL IN ESP AREA.
8. TENTATIVE PIPE CUM CABLE TRESTLE TO BE PROVIDED BY OWNER IS INDICATED IN THIS DRAWING. BIDDER'S CABLE TRAY FROM ESP CONTROL ROOM TO ESP SHALL BE ROUTED ON THIS TRESTLE. OTHER CABLE TRESTLE REQUIREMENT, IF ANY, SHALL BE PROVIDED BY THE BIDDER. DURING DETAILED ENGINEERING, BIDDER SHALL FURNISH THE LOADING OF CABLE AND CABLE TRAYS AS WELL AS SPACE REQUIREMENT FOR CABLING IN THE OWNER'S TRESTLE.
9. TYPICAL SECTION OF CABLE TRAY ARRANGEMENT IS INDICATED IN THIS DRG. BIDDER TO PROVIDE THE CABLE TRAYS AS PER THIS ARRANGEMENT SHOWN.
10. COMMON CONTROL ROOM FOR BOTH UNITS OF THIS PHASE OF THE PROJECT IS PROVIDED BETWEEN THE TWO UNITS IN TG HALL IN BC BAY AT OPERATING FLOOR LEVEL.
11. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METRE.
12. ALL ELEVATION INDICATED IN THE DRG ARE WITH RESPECT TO POWER HOUSE GROUND FLOOR ELEVATION AS 0.00M. THE FINISHED FLOOR LEVEL IN BOILER/ESP AREA/ID FAN/CHIMNEY AREA SHALL BE (-)0.20M.

FOR TENDER PURPOSE ONLY

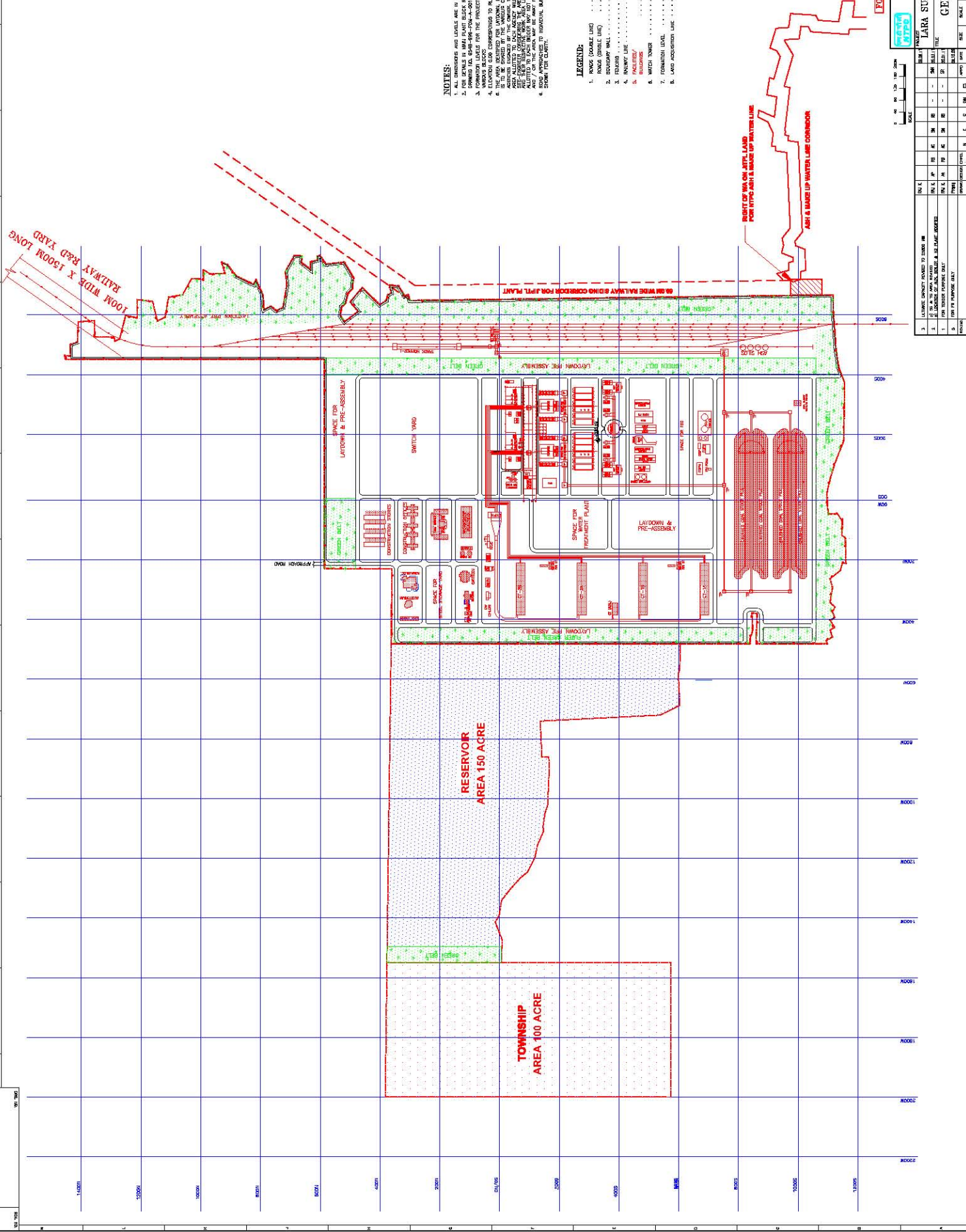
<b>NTPC LTD.</b> (A Government of India Enterprise) ENGINEERING DIVISION	
PROJECT <b>LARA SUPER THERMAL POWER PROJECT</b> STAGE - I (2x 800 MW)	
TITLE <b>LAYOUT OF ELECTRO STATIC PRECIPITATOR</b>	
SIZE A-1	SCALE NTS
DRG NO. 9548-104-POM-A-004	REV. NO. A

REV. NO.	DESCRIPTION	DATE	APPD.	CHKD.	DESIGN	DRAWN
A	RELEASED FOR TENDER PURPOSE	04-07-2011				

NOTES:

1. ALL DIMENSIONS AND LEVELS ARE IN METRES.
2. DIMENSIONS ARE TO FACE UNLESS SPECIFIED OTHERWISE.
3. FORWARD LEVELS FOR THE PROJECT IS AS SHOWN FOR.
4. ELEVATION COORDINATES TO RL+2825.0M.
5. THE AREA SHOWN IS THE LAYOUT FOR THE ASSEMBLY, OFFICES & STORES AND AREAS ADJACENT TO THE MAIN BUILDING. THE LOCATION OF THE MAIN BUILDING IS SHOWN IN THE ATTACHED GENERAL LAYOUT PLAN. THE MAIN BUILDING IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING REGULATIONS AND THE NATIONAL FIRE DEPARTMENT. THE MAIN BUILDING IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING REGULATIONS AND THE NATIONAL FIRE DEPARTMENT.
6. ROAD APPROACHES TO INTERNAL BUILDINGS / STRUCTURES ARE NOT SHOWN FOR CLARITY.

- LEGEND:
1. ROAD (DOUBLE LINE)
  2. ROAD (SINGLE LINE)
  3. FENCE
  4. RAILWAY LINE
  5. FACILITY
  6. SWITCH TOWER
  7. FORWARD LEVEL
  8. LAND ACQUISITION LINE



FOR TENDER PURPOSE ONLY

**NTPC Limited**  
A MEMBER OF NTPC GROUP

**LARA SUPER THERMAL POWER PROJECT**

**GENERAL LAYOUT PLAN**

NO.	REV.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	01	10/10/2010	...	...	...	...
2	02	10/10/2010	...	...	...	...
3	03	10/10/2010	...	...	...	...

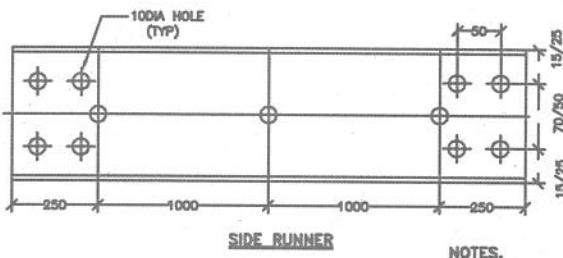
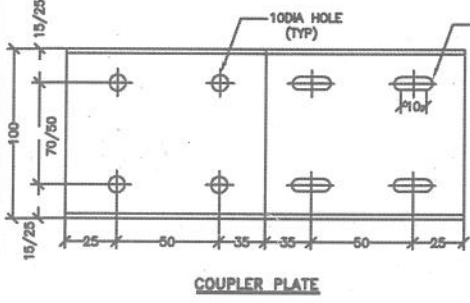
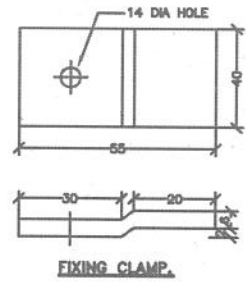
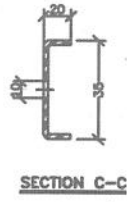
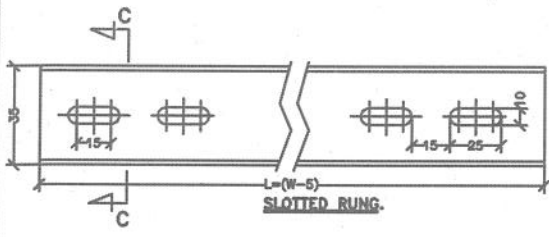
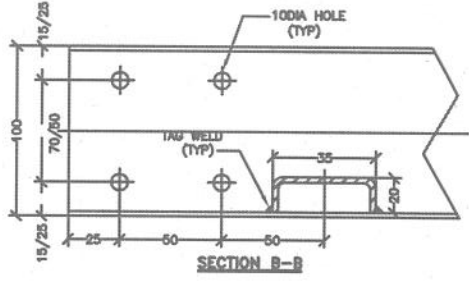
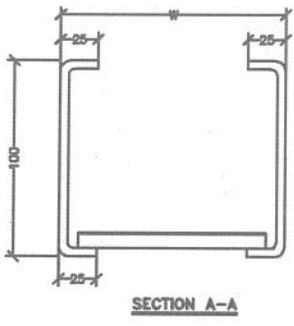
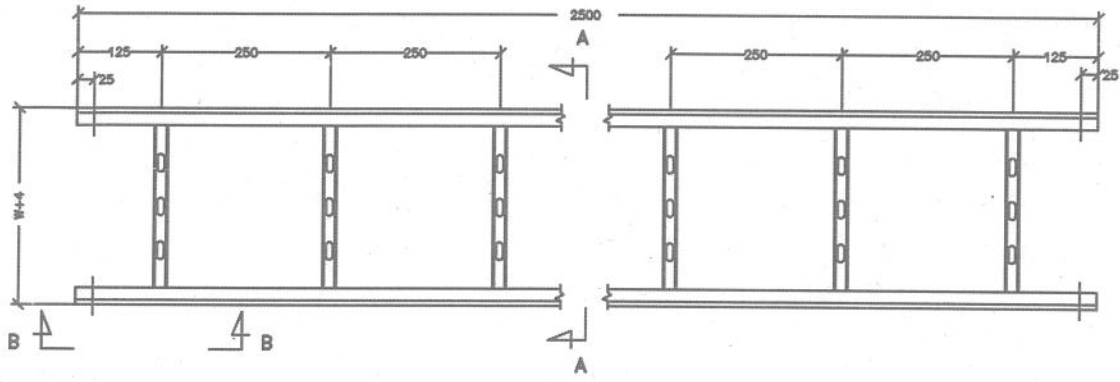
SCALE: 1:1000

DATE: 10/10/2010

PROJECT NO: 9548-999-POC-F-001

DESIGNER: NTPC LIMITED

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- NOTES.**
1. ALL DIMENSIONS ARE IN mm.
  2. MATERIAL:-2mm THICK MS SHEET.
  3. FINISH :-HOT DIP GALVANISED
  4. THICKNESS:-3mm COUPLER PLATE  
2mm TRAY.
  5. TOLERANCE:-AS PER RELEVANT IS.

RD	FOR TENDER PURPOSE	M3	M3	REL	-	W	-	-	-	AS	05.07.12
RC	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05.07.2008
RB	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07.04.2008
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07.04.2008

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE	
					CLEARED BY							



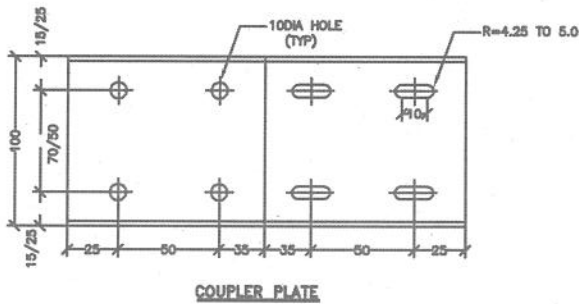
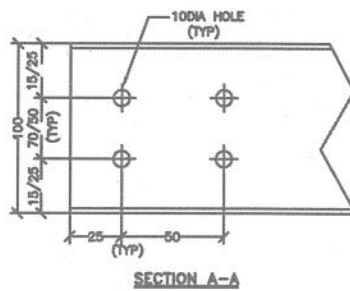
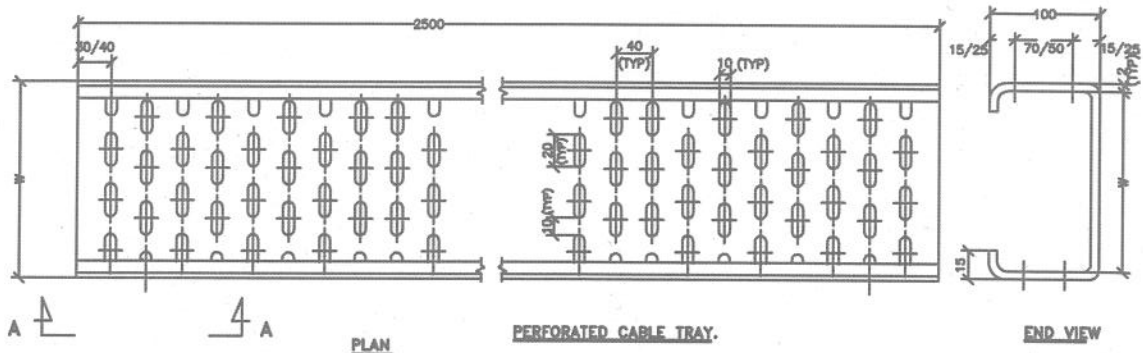
**NTPC LTD.**  
(A GOVERNMENT OF INDIA ENTERPRISE)  
ENGINEERING DIVISION

PROJECT **STANDARD**

TITLE **LADDER TYPE CABLE TRAY.**


SIZE A4 SCALE NTS DRG. NO. 0000-211-PDE-A-001 REV. NO. RD

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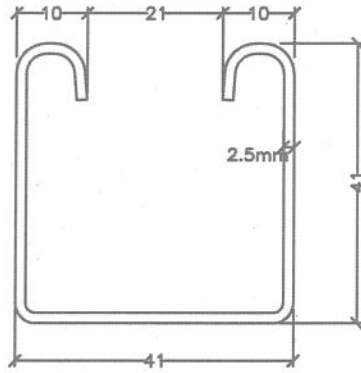


**NOTES.**

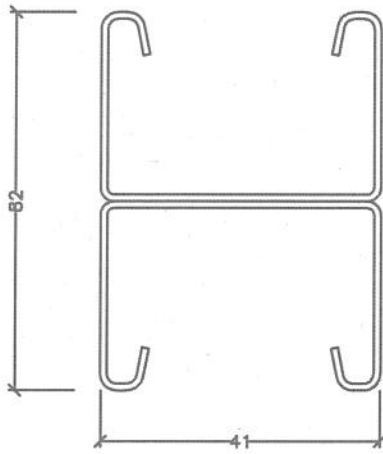
1. ALL DIMENSIONS ARE IN mm.
2. MATERIAL:-2mm THICK MS SHEET.
3. FINISH :-HOT DIP GALVANISED
4. THICKNESS:-3mm COUPLER PLATE  
2mm TRAY.
5. TOLERANCE:-AS PER RELEVANT I.S.
6. INNER WIDTH (W) :- 150, 300 & 600mm.

RD	FOR TENDER PURPOSE	RB	RB	RVP	-	WV	-	-	-	AS	05/07/20
RC	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	08/07/2008
RB	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07/04/2008
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	17/01/2008
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
					CLEARED BY						
		<p style="text-align: center;"><b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION</p>									
PROJECT		STANDARD									
TITLE		PERFORATED TYPE CABLE TRAY.									
SIZE A4	SCALE NTS	DRG. NO. 0000-211-PDE-A-002								REV. NO. RD	

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**SINGLE CHANNEL-TYPE C1**




**DOUBLE CHANNEL-TYPE C2**

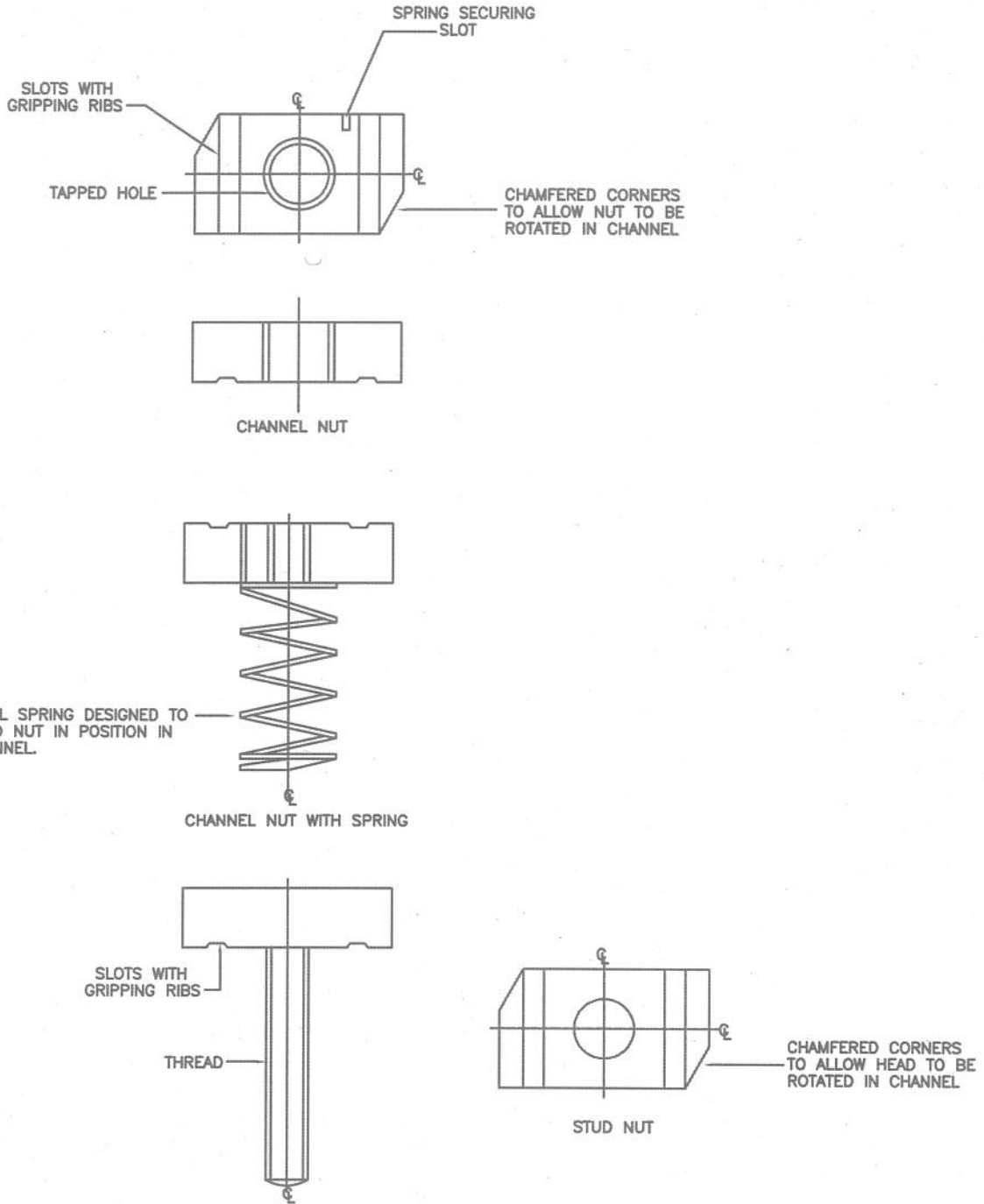
**TWO LENGTHS OF C1 WELDED BACK TO BACK**

**NOTES.**

1. ALL DIMENSIONS ARE IN mm.
2. MATERIAL :- 2.5mm. THICK MS SHEET.
3. TOLERANCE :-AS PER RELEVANT I.S.
4. FINISH :-HOT DIP GALVANISED

RC	FOR TENDER PURPOSE	1/3	1/3	DR	-	✓	-	-	-	AS	05.07.20
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05.07.20
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07.08.2000
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT		STANDARD									
TITLE		C1 & C2 CHANNEL, CABLE TRAY SUPPORT SYSTEM									
SIZE A4	SCALE NTS	DRG. NO. 0000-211-P0E-A-013							REV. NO. RC		

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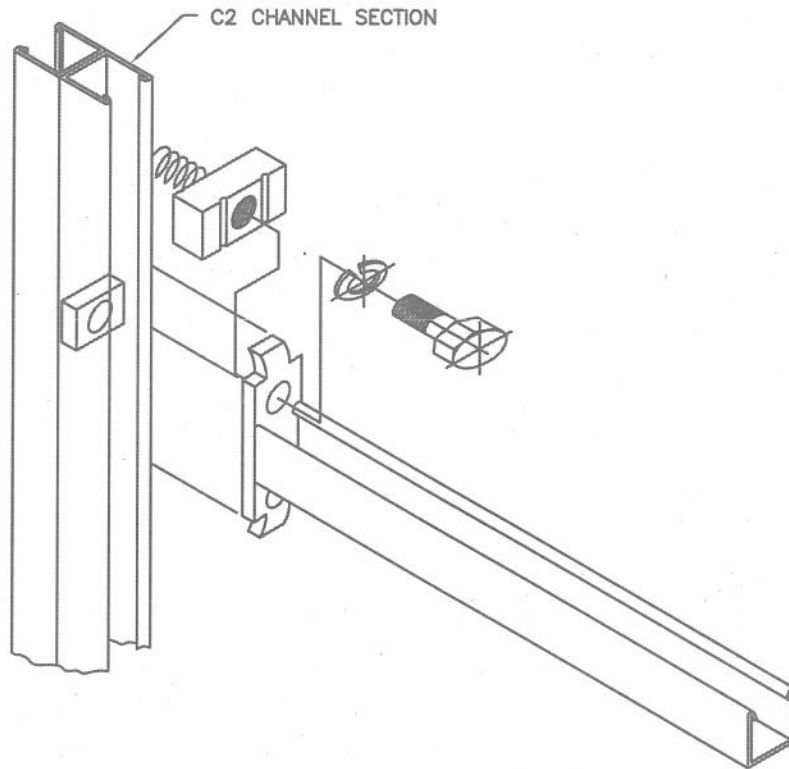


**TYPICAL DETAILS OF FIXING ACCESSORIES**

- NOTES.  
 1. MATERIAL :- MILD STEEL  
 2. FINISH :-HOT DIP GALVANISED


RC	FOR TENDER PURPOSE	M	M	RJR	-	VV	-	-	-	AS	05-07-10
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05-07-10
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07-08-09
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
एन टी पी सी <b>NTPC</b>		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT		STANDARD									
TITLE		TYPICAL DETAILS OF CABLE TRAY SUPPORT SYSTEM									
SIZE A4	SCALE NTS	DRG. NO. 0000-211-PDE-A-014							REV. NO. RC		

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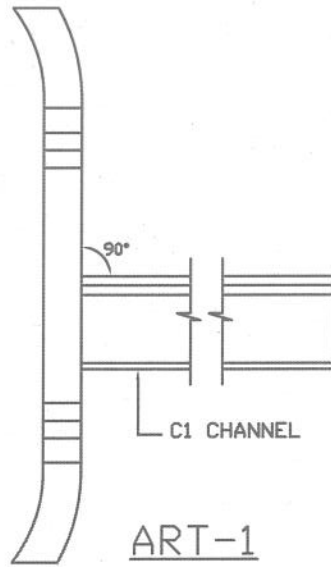
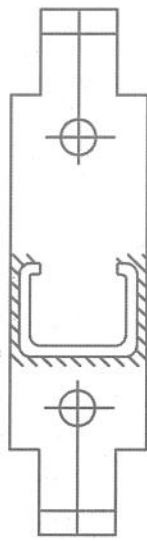


**NOTE.**

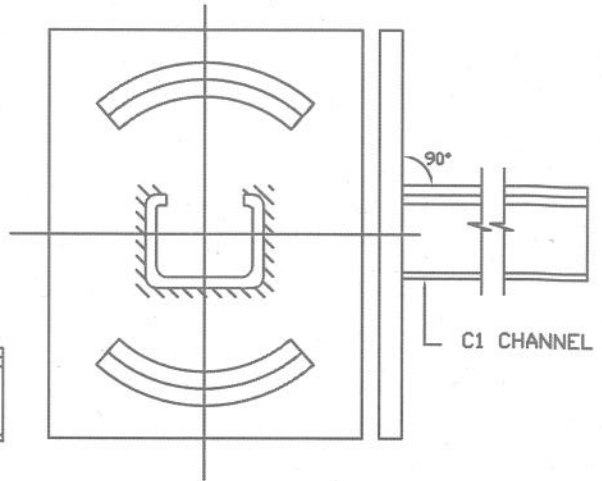
1. FINISH :-HOT DIP GALVANISED

RC	FOR TENDER PURPOSE	M3	M3	R4	-	VV	-	-	-	AS	05/17
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05/17
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07/08/00
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT											
STANDARD											
TITLE											
TYPICAL DETAIL OF CABLE TRAY SUPPORT SYSTEM											
SIZE	SCALE	DRG. NO.								REV. NO.	
A4	NTS	0000-211-POE-A-015								RC	

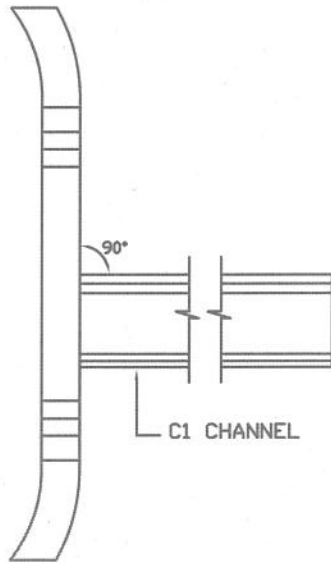
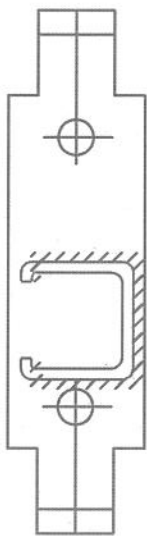
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ART-1




ART-3



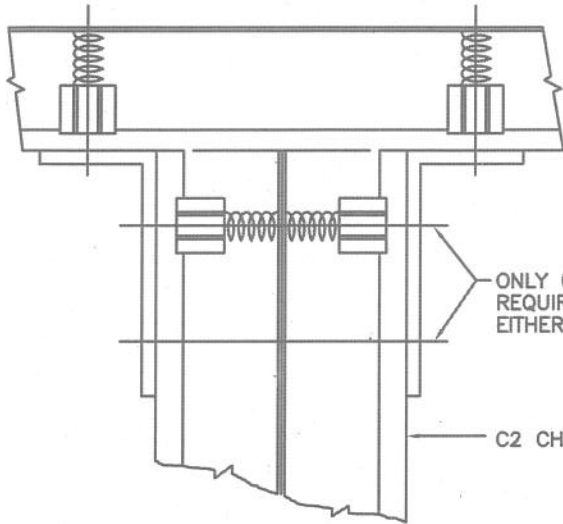
ART-2

**NOTES.**

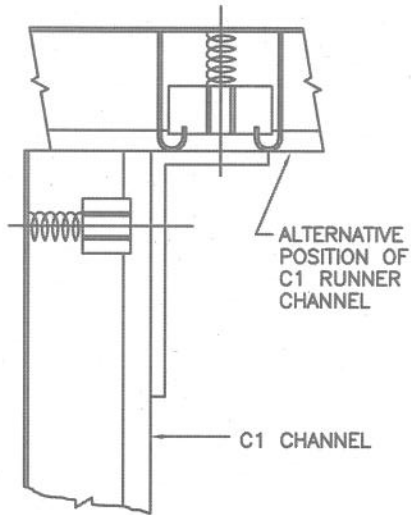
1. MATERIAL : MS SHEET.
2. FINISH : HOT DIP GALVANIZED

RC	FOR TENDER PURPOSE	M3	M3	RAJ	-	✓	-	-	-	AS	05-08-20
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05.07.2000
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	17.01.2000
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT											
STANDARD											
TITLE											
CANTILEVER ARMS											
SIZE	SCALE	DRG. NO.								REV. NO.	
A4	NTS	0000-211-POE-A-016								RC	

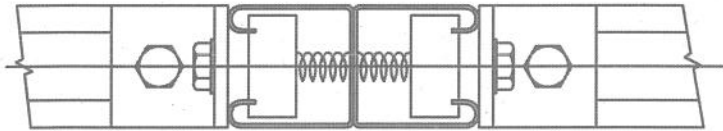
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**ASSEMBLY-1**



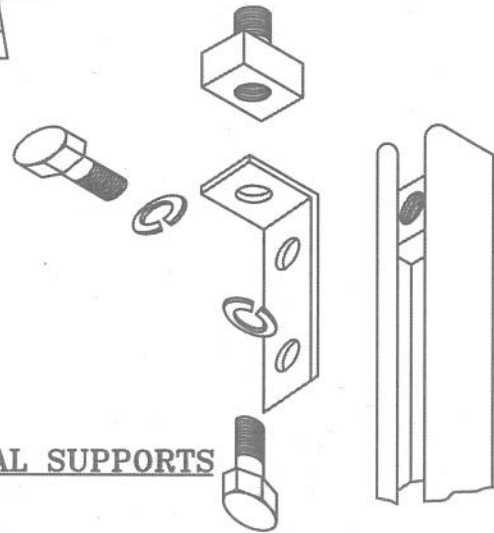
**ASSEMBLY-2**




**ASSEMBLY-1**  
UPPER FIXING C2 CHANNEL

**ASSEMBLY-2**  
UPPER FIXING C1 CHANNEL

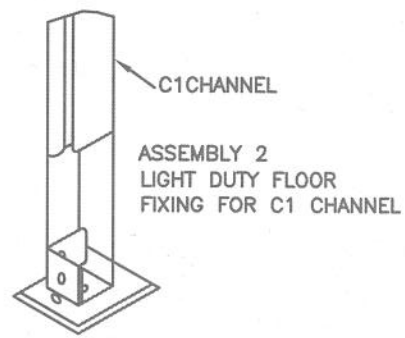
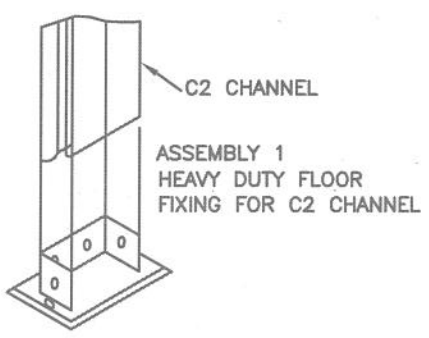
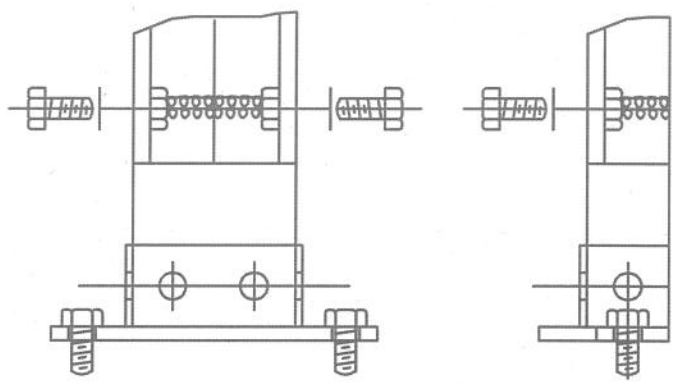
**UPPER FIXING FOR CHANNEL VERTICAL SUPPORTS**



- NOTES.  
1. MATERIAL : MS SHEET.  
2. FINISH : HOT DIP GALVANIZED


RC	FOR TENDER PURPOSE	M3	M3	RKH	-	VV	-	-	-	05/07/2000	
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	05/07/2000	
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	07/06/2000	
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT											
STANDARD											
TITLE											
TYPICAL DETAILS OF CABLE TRAY SUPPORT SYSTEM											
SIZE	SCALE	DRG. NO.							REV. NO.		
A4	NTS	0000-211-POE-A-017							RC		

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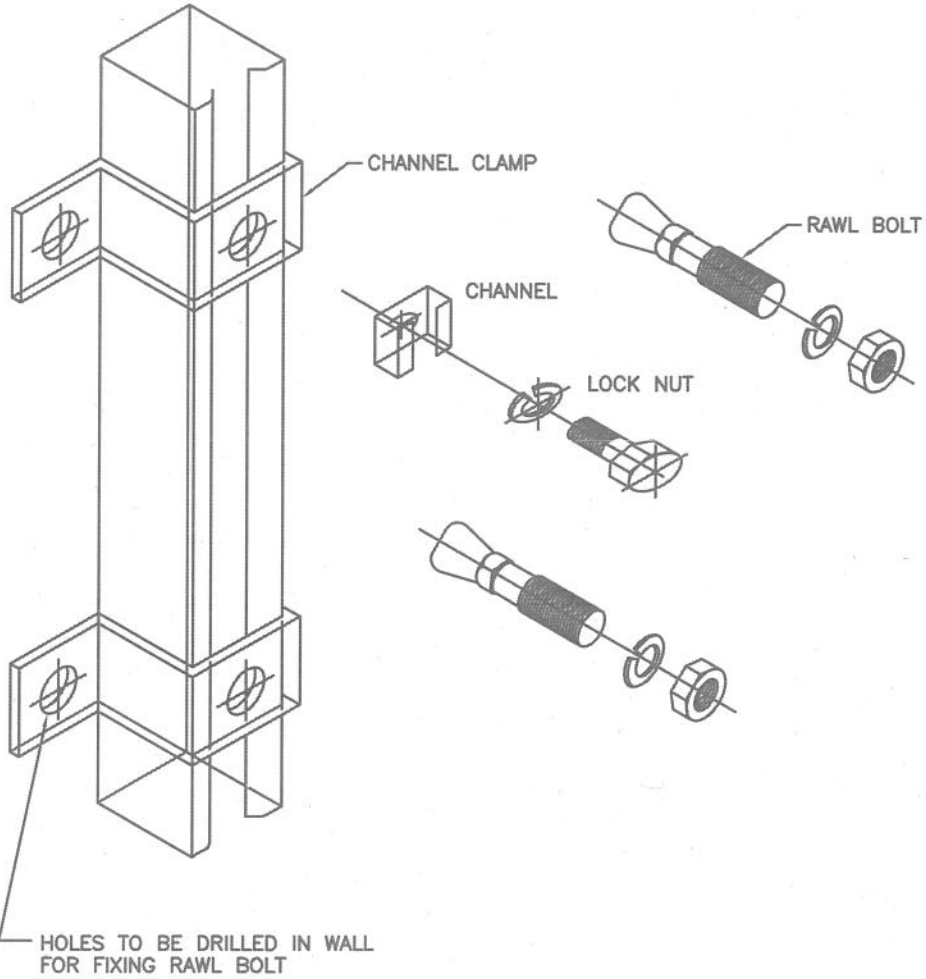


FLOOR FIXING FOR CHANNEL VERTICAL SUPPORTS

- NOTES.  
 1. MATERIAL : MS SHEET.  
 2. FINISH : HOT DIP GALVANIZED


RC	FOR TENDER PURPOSE	M3	M3	EXP	-	VV	-	-	-	AS	05/07/20
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05/07/20
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07/06/2000
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
 <b>एन टी पी सी</b> <b>NTPC</b>		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT											
STANDARD											
TITLE											
TYPICAL DETAILS OF CABLE TRAY SUPPORT SYSTEM											
SIZE	SCALE	DRG. NO.							REV. NO.		
A4	NTS	0000-211-POE-A-018							RC		

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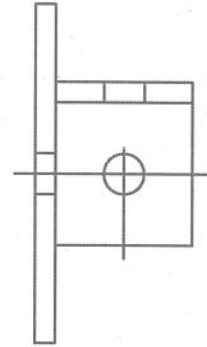
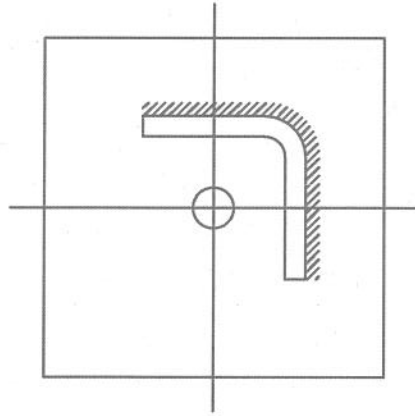
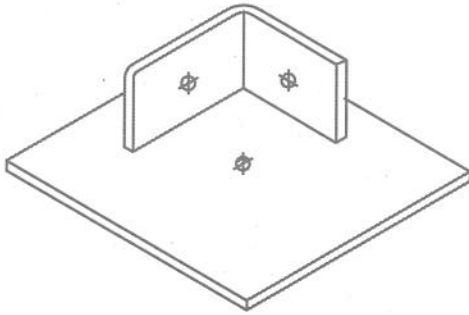


**NOTES.**

1. MATERIAL : MS SHEET.
2. FINISH : HOT DIP GALVANIZED


RC	FOR TENDER PURPOSE	B	B	EXP	-	W	-	-	-	AS	05/07/10
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05/07/10
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07/08/09
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT											
STANDARD											
TITLE											
FIXING OF CHANNEL IN TRENCH WALL											
SIZE	SCALE	DRG. NO.								REV. NO.	
A4	NTS	0000-211-POE-A-019								RC	

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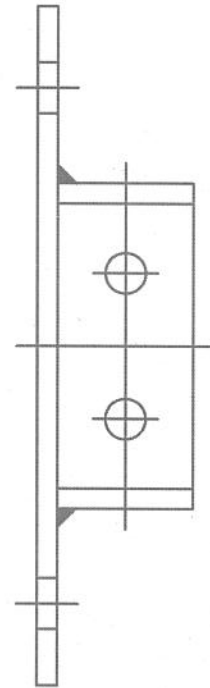
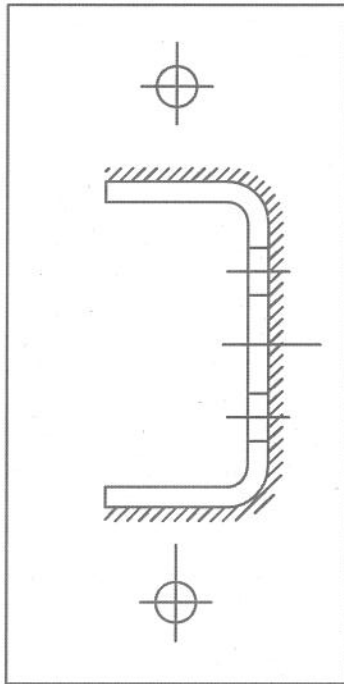
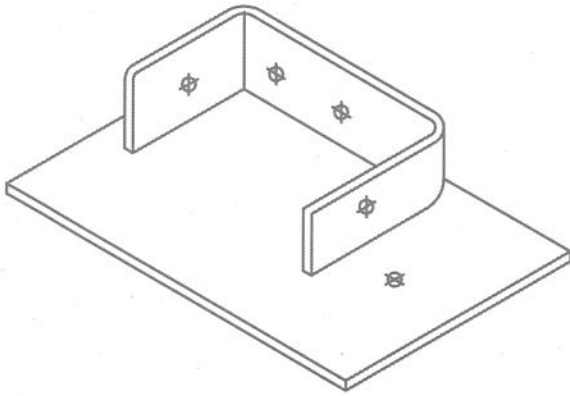


**NOTES.**

1. MATERIAL : MS SHEET.
2. FINISH : HOT DIP GALVANIZED


RC	FOR TENDER PURPOSE	B3	B3	PRP	-	✓	-	-	-	-	05/02/10
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05/02/10
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07/01/09
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
CLEARED BY											
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT											
STANDARD											
TITLE											
BRACKET FLOOR PLATE LIGHT DUTY.											
SIZE	SCALE	DRG. NO.							REV. NO.		
A4	NTS	0000-211-PDE-A-020							RC		

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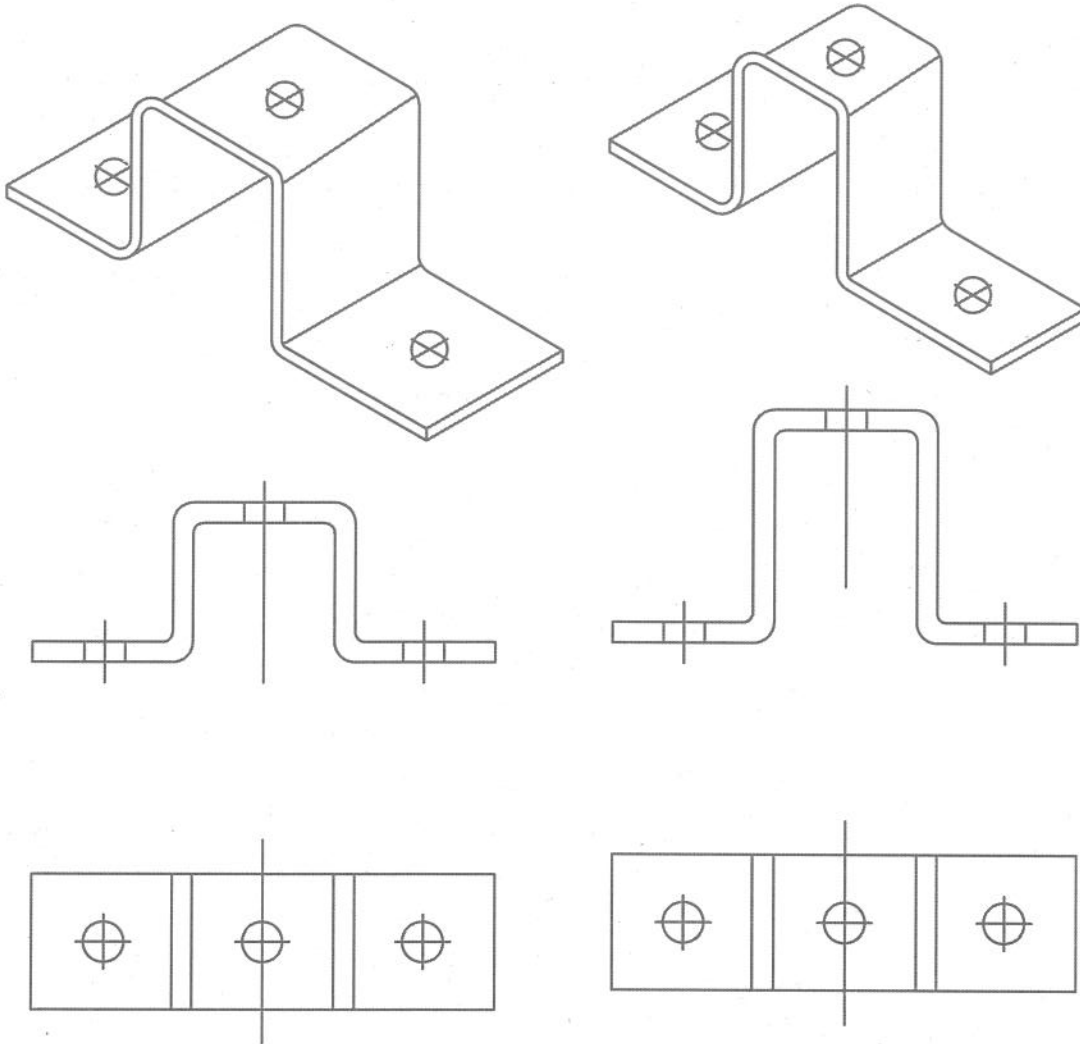


**NOTES.**

1. MATERIAL : MS SHEET.
2. FINISH : HOT DIP GALVANIZED

RC	FOR TENDER PURPOSE	B	B	PL	-	VV	-	-	-	-	AS	05-07-70	
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	-	AS	05.07.2000	
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	-	07.01.2000	
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE		
		CLEARED BY											
		<p align="center"><b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION</p>											
PROJECT		STANDARD											
TITLE		BRACKET FLOOR PLATE HEAVY DUTY.											
SIZE	SCALE	DRG. NO.						REV. NO.					
A4	NTS	0000-211-PDE-A-021						RC					


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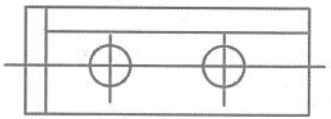
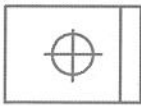
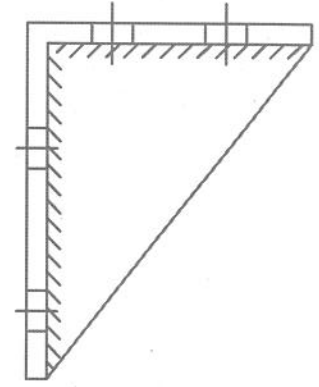
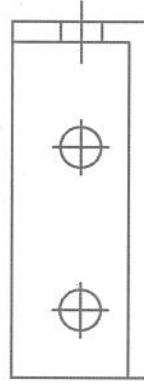
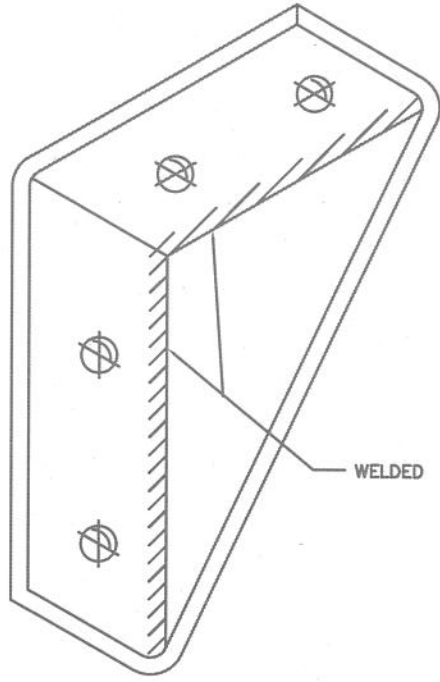
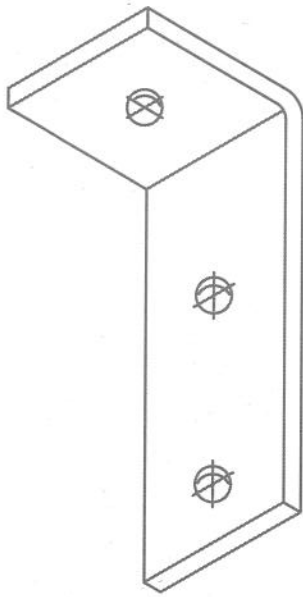
**BRACKET-C1 CHANNEL CLAMP HEAVY DUTY.**

**BRACKET-C2 CHANNEL CLAMP.**

- NOTES.**  
 1. MATERIAL : MS SHEET.  
 2. FINISH : HOT DIP GALVANIZED

RC	FOR TENDER PURPOSE	M3	M3	RA	-	✓	-	-	-	AS	05.07.2000
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05.07.2000
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07.01.2000
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
					CLEARED BY						
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT		STANDARD									
TITLE		BRACKET C1 CHANNEL CLAMP HEAVY DUTY. AND BRACKET C2 CHANNEL.									
SIZE A4	SCALE NTS	DRG. NO. 0000-211-PDE-A-022							REV. NO. RC		

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**BRACKET RIGHT ANGLE.**

**BRACKET RIGHT ANGLE HEAVY DUTY.**

**NOTES.**

1. MATERIAL : MS SHEET.
2. FINISH : HOT DIP GALVANIZED

RC	FOR TENDER PURPOSE	M3	M3	RA	-	M	-	-	-	-	AS	05/07/2010
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	-	AS	05/07/2010
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	-	07.08.2000
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE	
CLEARED BY												



**NTPC LTD.**  
( A GOVERNMENT OF INDIA ENTERPRISE )  
ENGINEERING DIVISION

PROJECT

STANDARD

TITLE

BRACKET RIGHT ANGLE &  
BRACKET RIGHT ANGLE HEAVY DUTY.

SIZE  
A4

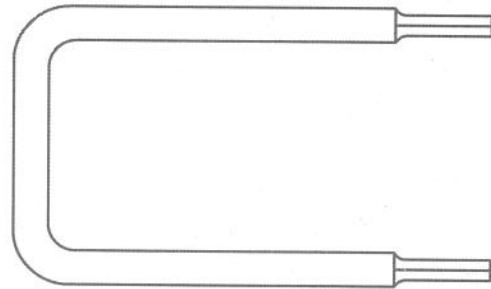
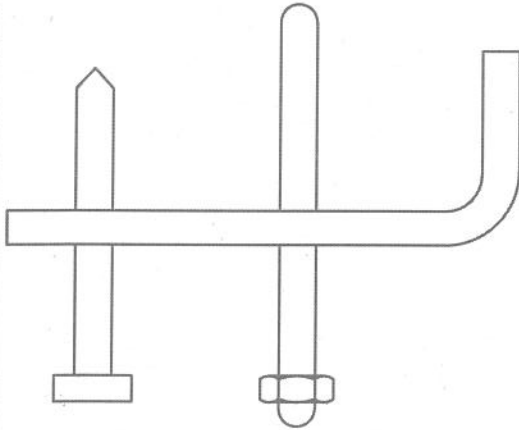
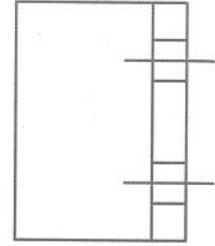
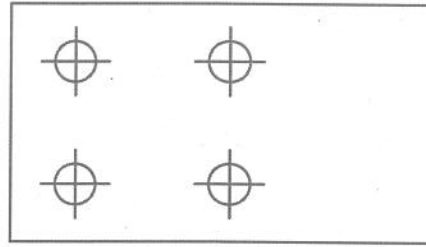
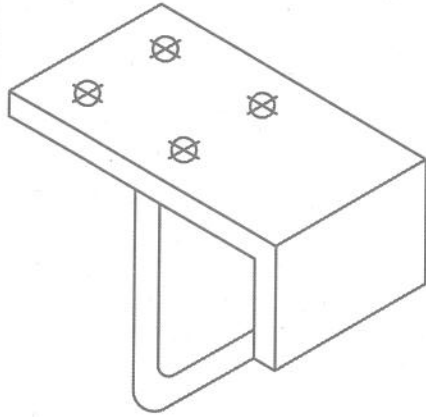
SCALE  
NTS

DRG. NO.

0000-211-PDE-A-023

REV. NO.  
RC

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**NOTES.**

1. MATERIAL : MILD STEEL
2. FINISH : HOT DIP GALVANIZED

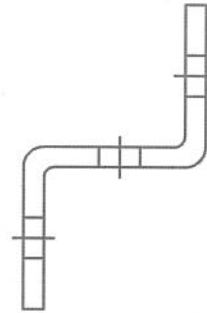
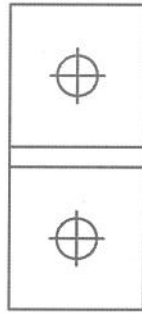
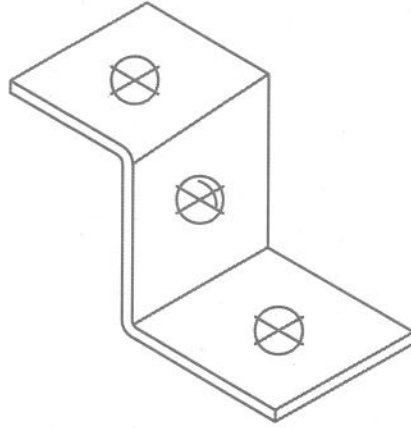
RC	FOR TENDER PURPOSE	B3	B3	PR	-	W	-	-	-	-	AS	05/07/20	
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	-	AS	05/07/20	
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	-	07.01.2000	
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE		
		CLEARED BY											



**NTPC LTD.**  
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ENGINEERING DIVISION


PROJECT		STANDARD	
TITLE		BEAM CLAMP.	
SIZE A4	SCALE NTS	DRG. NO. 0000-211-PDE-A-024	REV. NO. RC

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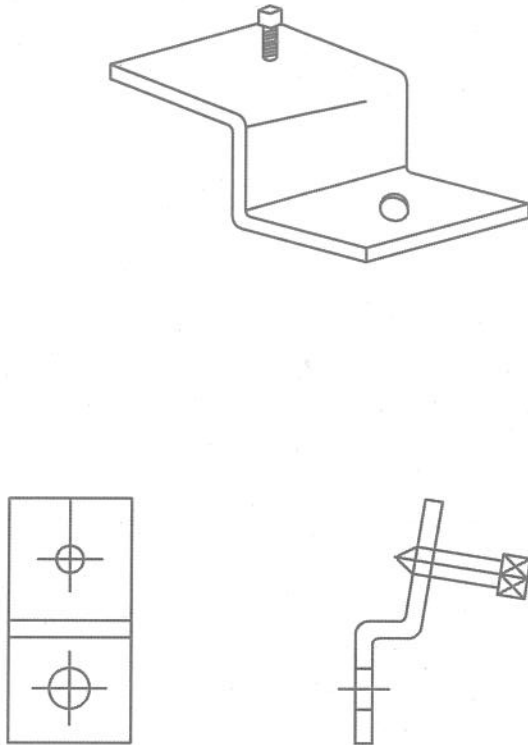


**BRACKET-C1 CHANNEL CLAMP.**

- NOTES.  
 1. MATERIAL : MILD STEEL  
 2. FINISH : HOT DIP GALVANIZED


RC	FOR TENDER PURPOSE	M3	M3	PR	-	W	-	-	-	AS	05/07/10
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05/07/10
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07/08/09
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
					CLEARED BY						
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT		STANDARD									
TITLE		BRACKET C1 CHANNEL CLAMP.									
SIZE	SCALE	DRG. NO.							REV. NO.		
A4	NTS	0000-211-PDE-A-025							RC		

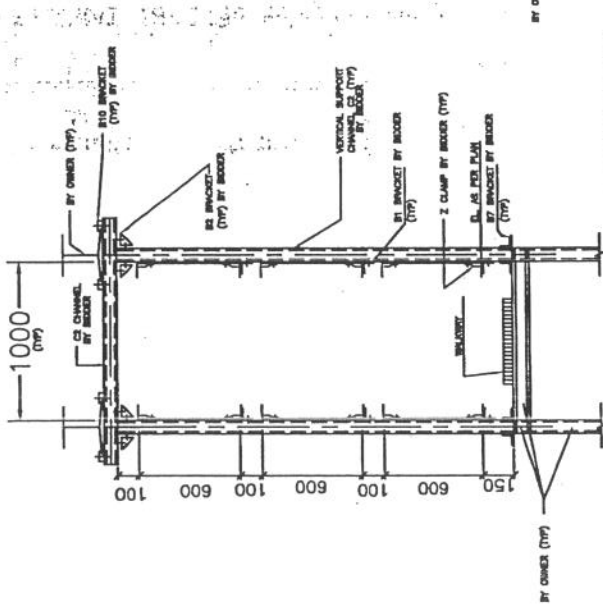
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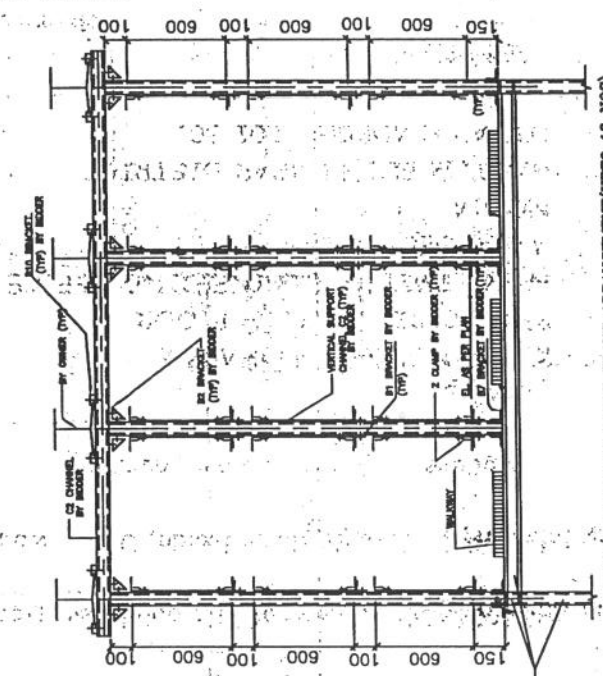
NOTES.

1. MATERIAL : MILD STEEL
2. FINISH : HOT DIP GALVANIZED

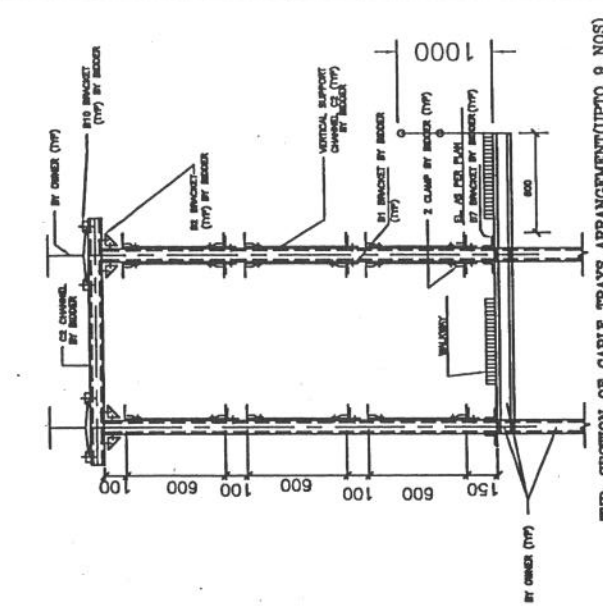
RC	FOR TENDER PURPOSE	A3	A3	REL	-	✓	-	-	-	AS	05/02/10
RB	FOR TENDER PURPOSE	DL	DL	SS	-	RA	-	-	-	AS	05/02/10
RA	FOR TENDER PURPOSE	-	-	-	-	-	-	-	-	-	07/01/2009
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD	M	E	C	C&I	ARCH	APPD	DATE
		CLEARED BY									
		<b>NTPC LTD.</b> ( A GOVERNMENT OF INDIA ENTERPRISE ) ENGINEERING DIVISION									
PROJECT		STANDARD									
TITLE		BRACKET BEAM CLAMP									
SIZE	SCALE	DRG. NO.							REV. NO.		
A4	NTS	0000-211-PDE-A-026							RC		



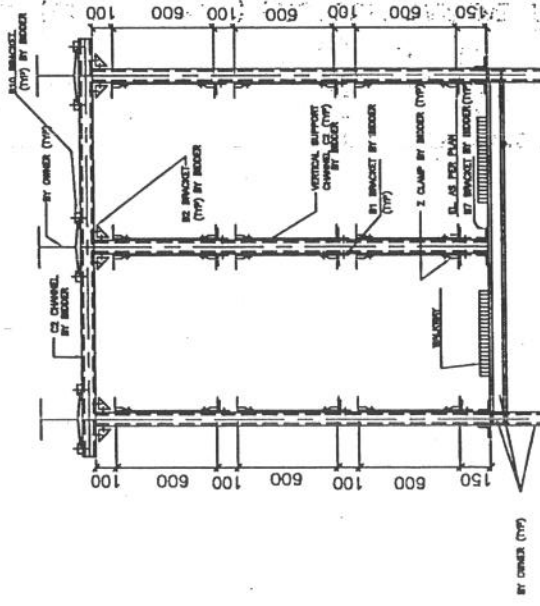
TYP. SECTION OF CABLE TRAY ARRANGEMENT (UPTO 6 NOS)  
TRAYS & IT'S SUPPORTING ARRANGEMENT TO BE PROVIDED BY BIDDER



TYP. SECTION OF CABLE TRAY ARRANGEMENT (UPTO 18 NOS)  
TRAYS & IT'S SUPPORTING ARRANGEMENT TO BE PROVIDED BY BIDDER



TYP. SECTION OF CABLE TRAYS ARRANGEMENT (UPTO 9 NOS)  
TRAYS & IT'S SUPPORTING ARRANGEMENT TO BE PROVIDED BY BIDDER



TYP. SECTION OF CABLE TRAYS ARRANGEMENT (UPTO 12 NOS)  
TRAYS & IT'S SUPPORTING ARRANGEMENT TO BE PROVIDED BY BIDDER

PROJECT		NTPC LIMITED (A GOVT. OF INDIA ENTERPRISES)	
TITLE		STANDARD	
TITLE		TYPICAL SECTION OF CABLE TRAY ARRANGEMENT IN TRESTYLE	
SIZE	SCALE	DRG. NO.	REV. NO.
A4	NTS	0000-101-POE-A-001	RA

RA	FOR TENDER PURPOSE ONLY	DESCRIPTION	DRAWN	DESIGN	CHKD.	CLEARED BY	DATE	APPRO.
REV. NO.							25/11/07	