
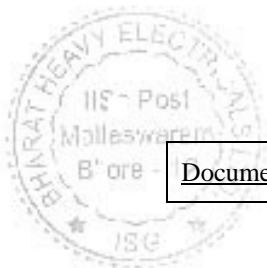



<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## **CONTENT**

<u><b>Sl No.</b></u>	<u><b>DESCRIPTION</b></u>	<u><b>PAGES</b></u>
1	COVER PAGE	1
2	CONTENT	1
3	PROJECT SYNOPSIS	1
4	CHECKLIST	4
5	SCOPE OF WORK	1
6	SPECIAL CONDITIONS OF CONTRACT	25
7	TERMS OF PAYMENT	2
8	TIME SCHEDULE	1
9	TOOLS AND PLANTS	8
10	MANPOWER REQUIREMENT	1
11	FACILITIES TO BE PROVIDED BY BHEL	3
12	FIELD QUALITY PLAN	1 set
13	HSE MANAGEMENT SYSTEM MANNUAL	62
14	TECHNICAL CONDITIONS OF CONTRACT (SECTION VI – SPECIFIC TECHNICAL REQUIREMENT OF CIVIL WORKS), RRVUNL/TCE TECHNICAL SPECIFICATION	222
15	TENDER DRAWINGS	1 Set



<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## PROJECT SYNOPSIS AND GENERAL INFORMATION

Name of the Owner: RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED (RRVUNL)

Address: 2 X 660 MW Super Critical -TPS, Suratgarh, District- Sriganganagar, Rajasthan, India


Nearest Railway: Suratgarh Junction Railway Station

Nearest City/Town: Suratgarh- 15 Km. Sri Ganga Nagar- 100 Km

Maximum Temperature: 50 deg.C


Minimum Temperature: (-) 2.8 deg. C



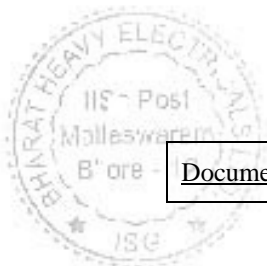
<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

**CHECK LIST (FOR TECHNICAL PART) TO BE FILLED IN AND SUBMITTED BY BIDDERS  
ALONG WITH TECHNO COMMERCIAL BID**


<b>Name of the Bidder</b>			
<b>Enquiry No.</b>			
<b>Name of the work</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS CIVIL & STRUCTURAL WORKS – AHP PACKAGE OUTSIDE PLANT BOUNDARY, CLARIFIER AND CHEMICAL HOUSE		
<b>SL. NO</b>	<b>CLAUSE</b>	<b>BHEL REQUIREMENT</b>	<b>ACCEPTANCE / CONFIRMATION BY BIDDER</b>
1	Understanding of Job	Bidder to confirm that they understood the nature of job, scope of work and tender requirements and their responsibilities	
2	Site visit and acquiring of knowledge and information about site conditions and work involved	Bidder to submit a declaration in a specific confirming that they have visited the site and acquired full knowledge and information about the site conditions and work involved and will not raise any claim of any nature due to lack of knowledge of site conditions.	
3	Completeness of tender document	Bidder to check and confirm the completeness of tender document. (Discrepancy if any shall be brought to notice of purchaser/ Engineer before submission of bid for necessary clarification)	
4	Technical Deviation	Bidder to confirm that all the requirements as per NIT has been considered in their offer and "No Technical deviation" made.	

<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>


5	Scope of Supply	Bidder to confirm the understanding that Structural Steel and Reinforcement Steel shall be supplied by BHEL as stated in NIT Specifications. All other construction materials required for the project including gratings, handrails and MS Rods/bars shall be supplied by the successful bidder.	
6	List of equipments, T&P available	Bidder to submit a list of equipments and T&P's available with them for deployment in this job	
7	Minimum requirement of equipments and T&P's	Bidder to confirm that the minimum requirement of equipments and T&P's as specified in the tender will be provided.	
8	Program for deployment of minimum requirement of equipments and T&P's	Bidder to submit the program for deployment of the minimum requirement of equipments and T&P's.	
9	Minimum requirement site management and supervisory staff	Bidder to confirm that the minimum requirement of site management and supervisory staff as specified in the tender will be provided.	



Document No.: <a href="#">IS-01-13-2000/137</a>	Sh. B- 4 / 47	Rev. : R0
-------------------------------------------------	---------------	-----------

<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

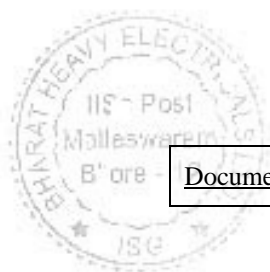
10	Quoted rates shall include all costs.	Bidder to confirm that their quoted rates are inclusive of all cost of materials (other than to be supplied by purchaser as specified in BOQ), labours, transportation, lead, lift, tools and plants, scaffolding, all types of consumables, water, taxes and duties as specified in commercial terms and conditions, expenses towards statutory, health and safety of their employees / workers engaged either directly or indirectly through their sub-vendors etc complete including cost of all infrastructures / facilities to be provided as per the tender and to further confirm that no extra claim will be made on to purchaser on whatsoever the case may be.	
11	Indemnity bond for material supply by purchasers free of cost	Bidder to accept that they will furnish necessary indemnity bond as per the direction of purchaser / Engineer for material supply by purchaser / Engineer free of cost	
12	Compliance of labour regulations in regard to all matters provided therein including Minimum wages Act, Workmen's Compensation Act etc.	It is the responsibility of bidder/ contractor to strictly comply with the provisions of Act as applicable and shall indemnify the purchaser / Engineer against any payment to be made under and for observances of the regulations without prejudice to his right to claim indemnify from his sub-contractors.	
13	Quality plan	Quality plan shall be followed as per the NIT specification given in Volume-2	


<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

14	All other terms and conditions	Shall be as per the tender document	
15	Type of Contract	Item Rate	
16	Un-Priced Format	Bidder to submit the Un-priced format, as an acceptance for the scope	
17	Prequalification criteria	Bidder shall furnish all the relevant documents in proof of prequalification along with technical bid and shall confirm the same.	
18	Whether the format for compliance with PRE-QUALIFICATION CRITERIA is understood and filled with proper supporting documents referenced in the specified format	Bidder shall furnish the relevant details as per the Annexure 'A' of Volume I	
19	Whether all pages of the Tender documents including annexure, appendices etc are read understood and signed.	Bidder to confirm that all the pages of the Tender documents including annexure, appendices etc are read understood and Signed	

**NOTE:**

1)	All the above columns are to be filled in by the bidder. Deviations will not be accepted by BHEL.
2)	Documents as called for above should be submitted along with Techno Commercial bid failing which the Price bid of the respective bidder will not be opened.
3)	No Price to be filled in un price format. Price to be filled up only in price format.
	<b>Signature of bidder with seal &amp; date</b>




	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## SCOPE OF WORK

1.0	The scope of work in general, comprises of Execution of Civil & Structural works which includes <b>Supply (except reinforcement &amp; structural steel as described elsewhere), Earth work, RCC, Slope protection, Fabrication, Construction, Erection including</b> architectural and finishing works required for construction of Fly Ash Silos, weight bridge with control room, Silo Utility Buildings cum MCC Buildings, connecting cable rack, ash conditioner water tank, Pipe rack, Pipe supporting pedestals, Ash Water Recovery Pump House, Ash Water Tank, Clarifier, cooling tower, Chemical House, Parshall Flume, Decantation Well, Road, Paving, Grade Slab, boundary wall, slope protection of earth work, Pipe Encasement, Approach bund/bridge for Unit 7 & 8 on item rate basis as per BOQ for all the above mentioned structures.
2.0	Primarily the kind of Civil and Structural works required for the structures and buildings shall be as per approved Drawing and BOQ.
3.0	Various dimensions and relative elevations shown in the tender drawings for various structures are minimum. The final drawings shall be made available to successful bidder after award of work.
4.0	The scope of work also includes attending meeting at Owner (Project site/Bangalore) or at places decided by employer as and when necessary for review, discussions, coordination etc.
5.0	The scope of work also includes receipt, storage and transportation of materials supplied, if any, by the BHEL.
6.0	The scope of work shall include all other works not specifically mentioned above but necessary for satisfactory completion of the Ash handling package
7.0	The scope of work includes making all necessary arrangements for access to the storage yard from the nearest approach road and further to the actual site of work, as necessary and maintenance of the same in order to facilitate transport of machinery and equipment such as crane, etc, Refurbishment of existing access roads, if necessary, shall also be done by contractor at no extra cost.
8.0	The contractor shall be fully responsible for arranging all materials to meet the requirements of the project. Procurement material for structural works shall be procured only from approved vendor list as per employer RRVUNL/BHEL.

### **Note:**

Bidder shall submit a signed copy of BHEL's tender documents as technical offer along with the technical bid without any deviations.

	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## SPECIAL CONDITIONS OF CONTRACT

This Tender Specifications is for Execution of Civil & Structural works which includes Supply (except reinforcement & structural steel as described elsewhere), Fabrication, Construction, Erection including architectural and finishing works required for construction of Ash Handling package of Unit 7 to 8 on item rate basis as per BOQ for all the structures.

The technical requirements for the work to be executed under this specification shall be as per the approved drawings and technical requirements described in Volume-2 (RRVUNL Specification).

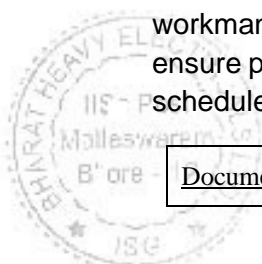
The intent of the scope of work is to provide services for execution of the project to most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for the proper and efficient services towards the successful completion of the project shall not relieve the contractor of the responsibility of providing such services / facilities to complete the work or portion of work awarded to him. The quoted/accepted rates / price shall deem to be inclusive of all such contingencies.

The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during erection. If any portion of works is found to be defective in workmanship and not conforming to drawings / documents or other stipulations, the contractor shall dismantle and re-do the work duly replacing the defective materials at their own cost, failing which recoveries, as determined by BHEL ISG, shall be effected from contractor's bills.


It is not the intent of this specification to specify herein all the details of supply, construction fabrication and erection. However, the system shall conform in all respects to high standards of quality and workmanship for performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgments is not in full accordance herewith.

The omission of specific reference to any fabrication / erection or other method, equipment or material necessary for proper and efficient working of the plant shall not relieve the bidder of the responsibility of providing such facilities to complete the work at quoted rates. Any mismatch/ defect found due to mistake in fabrication / erection shall have to be rectified by the vendor free of cost. Inspection by BHEL ISG/Customer does not relieve vendor of his responsibility of executing quality work.

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 and timely completion of the work to meet the overall project schedule. The contractor must deploy adequate quantity of tools & plants, modern / latest





	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

construction aids etc. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

Contractor shall supply construct, fabricate and erect as per the sequence & methodology prescribed by BHEL ISG depending upon the technical requirements. Availability of materials and fronts will decide this. BHEL ISG 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.

Following shall be the minimum responsibility of contractor and have to be provided within finally accepted rates / prices:

Provision as required of all types of labour, supervisors, engineers, watch and ward, tools & tackles, calibrated IMTEs (Inspection, measuring and testing equipment) as specified and otherwise required for the work, consumables for erection, testing and commissioning including material handling.

Achieving Proper out-turn / Turn-over as per BHEL ISG plan and commitment.

Completion of work as per BHEL ISG Schedule

Good quality and accurate workmanship for proper performance of the equipment

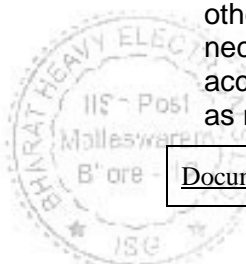
Repair and rectification


Preservation / Re-conservation of all components during storage / erection /commissioning till handing over.

**ALSO INCLUDED IN THE SCOPE:**

Unless otherwise specified, the work to be provided by the contractor for the items mentioned in the **Section A** shall include but not be limited to the following. The quoted rates by the contractor shall be all inclusive. (The Contractor shall have to use materials of the makes/manufacturers specified in the list of material of approved brand and/or manufacturer approved by RRVUNL contained in this tender form).

- a) Furnishing all labour, materials, supervision, construction plans, equipment, supplies, transport to & from the site, fuel, electricity, compressed air, water, transit and storage insurance and all other incidental items and temporary works not shown on specified but reasonably implied or necessary for the proper completion, maintenance and handing over the works, except in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provided by the engineer during the course of works.



	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>


- b) Furnishing samples of all materials required by the engineers for testing/inspection and approval for use in the works as described in Volume -2, RRVUNL Technical Specification Section –VI, Section – D4.6 – Part D. The samples may be retained by the engineer for final incorporation in the works.
- c) Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the engineer.
- d) Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that is required for all works including temporary works.
- e) Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified.
- f) Carrying out required survey and establish levels and coordinates at suitable intervals from existing grid levels and coordinates furnished by the owner established bench marks, setting out the locations and levels of proposed structures, constructions and marking of reference pillars and other identifications works etc as required. The contractor shall provide the owner/BHEL ISG such an assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used.
- g) Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract and BOQ.

BHEL ISG is an ISO 9001-2000, ISO 14001-1996 and OHSAS 18001-1999 certified company. Quality of work to customer's satisfaction and system requirements is the essence of these certifications. The contractor in all respects will organize his work, systems, environment, process control documentation, tools, plant, inspection, measuring and testing equipments etc., as per instructions of BHEL ISG engineer.

Maintaining proper documentation of all the site activities undertaken by the Contractor as per the proforma mutually agreed with BHEL ISG, Submission of monthly progress reports and any such document as and when desired by BHEL ISG/owner, taking approval of all statutory as applicable for respective portions of work fall under the jurisdiction of such statutes of laws.

The contractor shall also comply with applicable legislation and regulations with regard to health, safety and environmental aspects for minimizing risk arising from occupational health, safety hazards, controlling pollution and wastages.

The customer RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED and/ or their consultant may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works at no extra cost to BHEL ISG. Any defect in quality of work or deviations from drawings/specifications pointed out during

	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

such inspection shall be made good by the contractor in the same way as if pointed out by the BHEL ISG Engineer, without any cost implications to BHEL ISG.

#### INSTRUCTION TO BIDDERS:

The bidders are advised to physically visit the site and fully acquaint themselves with site conditions, transportation routes, various distances and the fact that other contractors would be working in this area and their structures are to be protected. The material brought and stacked for construction should not make hindrance to other contractors. Necessary precautions and arrangements including sprinkling of water during work as acceptable to BHEL ISG for safety & security for the above have to be made by the contractor. No claim will be entertained by BHEL ISG on ground of lack of knowledge and the contractor's rates shall be deemed to have taken this into account.


The contractor, in the event of this work awarded to him, shall establish an office at site and keep posted an authorized, responsible officer with valid Power of Attorney for the purpose of the contract. Any order or instructions of the engineer or his duly authorized representative, communicated to the contractor's representative at site office will be deemed to have been communicated to the contractor at his legal address.

The Contractor shall have to use materials of the makes/manufacturers specified in the list of material of approved brand and/or manufacturer approved by RRVUNL contained in this tender form.

The contractor shall provide within finally accepted price / rates, all consumables (excepting those indicated in BHEL ISG scope), gases (inert, welding, and cutting), soldering material, dye penetrants, radiography films, etc. Other erection consumables such as tapes, jointing compound, grease, mobile oil, M-seal, Araldite, petrol, CTC / other cleaning agents, grinding and cutting wheels are to be provided by the contractor. Steel, packers, shims, wooden planks, scaffolding materials hardware items etc required for temporary works such as supports, scaffoldings are to be arranged by the contractor. Sealing compounds, gaskets, gland packing, wooden/concrete sleepers, for temporary work, required for completion of work except those which are specifically supplied by manufacturing unit are also to be arranged by the contractor.

It shall be the responsibility of the contractor to plan the activities and store sufficient quantity of consumables. Non-availability of any consumable materials or equivalent suggested by BHEL ISG cannot be considered as reason for not attaining the required progress or for additional claim.

It shall be the responsibility of the contractor to obtain prior approval of BHEL ISG, regarding suppliers, type of electrodes etc before procurement of welding electrodes. On receipt of electrodes at site these shall be subjected to inspection and approval by BHEL ISG. The contractor shall inform BHEL ISG details regarding type of electrodes, batch number, date of expiry etc and produce test

<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

certificate for each lot / batch with correlation of batch / lot number with respective test certificate. No electrode without a valid test certificate will be allowed to be used.

BHEL ISG reserves the right to reject the use of any consumable including electrodes, gases, lubricants / special consumables if it is not found to be of the required standard / make / purity or when shelf life has expired. Contractor shall ensure display of shelf life on consumable wherever required and records maintained.

Storage of all consumables including welding electrodes shall be done as per requirement / instruction of the Engineer by the contractor at his cost.

In case of improper arrangement for procurement of any consumable, BHEL ISG reserves the right to procure the same from any source and recover the cost from the Contractor's first subsequent bill at market value plus the departmental charges of BHEL ISG from time to time. Postponement of such recovery is normally not permitted. The decision of Engineer in this regard shall be final and binding on the Contractor.

#### **CONTRACTOR'S SUPERVISION:**

(Also refer relevant clauses of General Conditions of Contract in this regard)

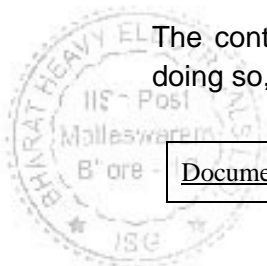
The contractor shall deploy adequate site supervision personals. List of minimum requirement of supervisor personals is given in tender. Contractor to confirm deployment of personals as given in tender in case of award of work. Contractor also to confirm & provide additional persons as per site requirement.


If the contractor fails to appoint suitable engineers as aforesaid, the BHEL ISG engineer shall have full powers to suspend the execution of work and stop payment of any money that may have become due until such date as a suitable engineers are appointed and the contractor shall be held responsible for the delay caused to the work and no extension of time on this account shall be given to him.

Orders given to the contractor's engineers shall be considered to have the same force as if they had been given to the contractor himself.

The contractor's engineers or his agent shall be in attendance at the site during all working hours and shall superintend the execution of work with such additional assistance in each grade as the engineer may consider necessary.

The contractor or their engineers shall attend, when required and without making any claim for doing so, either the office of the engineer or the work site to receive instructions.



<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

The BHEL ISG engineer shall have full powers to instruct the contractor to arrange for immediate termination of services in connection with this contract, of any agent, servant or employee whose continued employment is, in his opinion, undesirable without assigning any reason.

#### **SUPERVISORY STAFF AND WORKMEN:**

The contractor shall deploy all the necessary skilled / semi-skilled / unskilled labour including highly skilled workmen etc. These workmen should have previous experience on similar job. They shall hold valid certificates wherever necessary. BHEL ISG reserves the right to decide on the suitability of the workers and other personnel who will be deployed by the contractor. BHEL ISG reserves the right to insist on removal of any employee of the contractor at any time if he is found to be unsuitable and the contractor shall forthwith remove him.

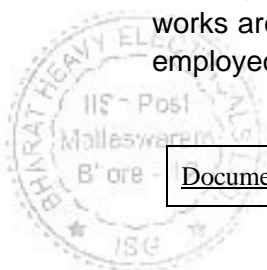
The Contractor in the event of engaging 10 or more workmen, shall obtain Independent license under the Contract labour (Regulation and Abolition) Act 1970 from the concerned authorities based on Form-V issued by the Principal Employer/Customer. In order to issue Form-V by Customer, Contractor shall fulfill all Statutory requirements like Insurance Policy, PF Code / PF Account number etc as per the requirement of BHEL ISG /Customer.


Contractor shall deduct the necessary amount towards Provident Fund and contribute equal amount as per Government of India laws. This amount will be deposited regularly to the provident Fund Commissioner. BHEL ISG /Customer may insist for submission of the account code duly certified by PF Commissioner.

Contractor may also be required to comply with provisions of ESI Act in vogue if applicable and submit evidence to BHEL ISG. BHEL ISG / Customer may insist for witnessing the regular payment to the labour. They may also like to verify the relevant records for compliance with statutory requirements. Contractor shall enable such facilities to BHEL ISG / Customer.

Contractor shall deploy only qualified and experienced engineers/ supervisors. They shall have professional approach in executing the work. The contractor's supervisory staff shall execute the work in the most professional manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. They shall be responsible to ensure that the assembly and workmanship conform to dimensions and tolerances given in the drawings/instructions given by BHEL ISG engineer from time to time.

The supervisory staff employed by the contractor shall ensure proper outturn of work and discipline on the part of the labour put on the job by the contractor. Also in general they should see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL ISG or other contractors of BHEL ISG or BHEL ISG's client.



	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc for entering the project premises. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer / BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permits for working beyond normal working hours.

The actual deployment of Labour and Engineer / Supervision staff shall be so as to satisfy the erection and commissioning targets set by BHEL ISG. If at any time, it is found that the contractor is not in a position to deploy the required engineers/supervisors/workmen due to any reason; BHEL shall have the option to make alternate arrangements at the contractor's risk and cost. The expenditure incurred along with BHEL overheads thereon shall be recovered from the contractor.

Contractor shall not employ Child labour and shall not deploy women labour at night.

The work shall be executed under the usual conditions like rain, insufficient space, improper approach roads etc., effecting major construction work and in conjunction with numerous other operations at site. The contractor and his personnel shall co-operate with other personnel/contractor, co-ordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.


The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerances given in the drawings/documents/instructions given by BHEL ISG engineer from time to time.

It is the responsibility of the contractor to engage his workmen in shifts or on overtime basis for achieving the targets set by BHEL ISG. The contractor's finally accepted rates shall include all these contingencies.

During the course of construction, if the progress is found unsatisfactory, or in the opinion of BHEL ISG, if it is found that the skilled workmen like welder, fitters, technicians etc. deployed are not sufficient, BHEL ISG after giving reasonable opportunity to the contractor, will induct on the work the required workmen in addition to contractor's workmen to improve the progress and recover from the contractor's bills.

If the contractor or his workmen or employees shall break, deface, injure or destroy any part of a building, road kerb, fence, enclosure, water pipes, cables, drains, electric or telephone posts or wire, trees or any other property or to any part of erected components etc., the contractor shall make the same good at his own expense or in default, BHEL ISG may cause the same to be made



	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

good by other workmen or by other means and deduct the expenses (of which BHEL ISG's decision will be final) from any money due to the contractor.

The month wise manpower deployment plan to be submitted to BHEL ISG and is only to assess the capability as well as understanding of the contractor to execute the work. It shall be the contractor's responsibility to deploy the required manpower, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account.

### **MATERIALS, MATERIAL HANDLING, STORAGE & PRESERVATION ETC**


The contractor shall at his own expenses provide all construction materials required for the work. However BHEL ISG will supply structural steel required for structural works, reinforcement steel free of cost as per terms & conditions specified in commercial part in the tender.

All materials to be provided by the contractor shall be of the best kind in conformity with the specifications laid down in the contract or as per relevant Indian Standards and technical specification. If requested by the engineer, furnish proof to the satisfaction of engineer that the materials so comply as per the Quality assurance given in RRVUNL Specifications.

The contractor shall, at his own expenses and without delay, supply to the engineer samples of materials proposed to be used in the works. The engineer shall within seven days of supply of samples or within such further period as he may require will intimate to the contractor in writing, whether samples are approved by him or not. If samples are not approved, the contractor shall forthwith arrange to supply to the engineer for his approval fresh samples complying with the specifications laid down in the contract. Any delay in approval of samples (original or fresh ones) shall not make the contractor eligible for any compensation.

BHEL ISG engineer shall have full powers for removal of any or all of the materials brought to site by the contractor which are not in accordance with the contract specifications or do not conform in character or quality to samples approved by him. In case of default on the part of the contractor in removing rejected materials, the engineer shall be at liberty to have them removed by other means. The BHEL ISG engineer shall have full powers to procure other proper material to be substituted for rejected materials and in the event of the contractor refusing to comply; he may cause the same to be supplied by other means. All costs, which may attend upon such removal and / or substitution, shall be borne by the contractor.

The contractor shall indemnify BHEL ISG, its representatives or employees against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or material or part thereof included in the contract. In the event of any claim being

	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

made or action being brought against BHEL ISG or any agent, servant or employee of BHEL ISG in respect of any such matters as aforesaid, the contractor shall immediately be notified thereof, provided that such indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by BHEL ISG but the contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursed to the contractor only if the use was the result of any drawings and / or specifications issued after submission of the tender.

The engineer shall be entitled to have tests carried out as specified in the contract for any materials supplied by the contractor other than those for which, as stated above, satisfactory proof has already been furnished, at the cost of the contractor and the contractor shall provide at his expense all facilities which the engineer may require for the purpose. If no tests are specified in the contract and such tests are required by the engineer, the contractor shall provide all facilities required for the purpose and the charges for these tests shall be borne by the contractor only.

#### **MATERIALS SUPPLIED BY BHEL ISG FREE OF COST**

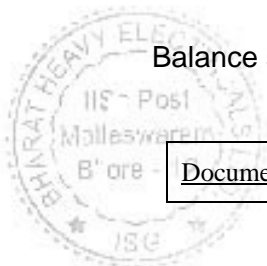
BHEL ISG will supply Structural Steel required for structural works and Reinforcement for RCC works free of cost as per terms & conditions specified below. Materials will be issued only for permanent works and not for making templates, other temporary works, enabling works etc., and the same shall not be taken into account for purpose of material reconciliation.

The contractor shall bear all other costs including the lifting, carting from issue points to works site/ contractor's stores, unloading custody and handling etc. and return of surplus/ serviceable materials to owner's stores to be designated by the Engineer-in-charge and all expenditure will be made by the contractor.


All structural / reinforcement steel shall be issued in available lengths / shapes on weight basis and cost of all straightening, cutting and jointing if any required shall be borne by the contractor and no claims for extra payment on account of issue of non-standard lengths/shapes will be entertained by BHEL ISG.

For the purpose of accounting of reinforcement / structural steel, the steel received by the contractor on weight basis from BHEL ISG stores / directly from steel supplier on F.O.R site basis shall be the basis for received quantity of steel. The charges of weighing if any, loading and unloading of steel, further transport, lead, lift etc., shall be borne by the contractor. The difference in unit weight as per IS and actual as issued, if any shall be to the contractor's account and contractor shall quote the rates for corresponding item to take care of such difference.

Balance steel shall be returned to BHEL ISG in good condition and in acceptable length.





	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

Quoted price by the contractor shall be deemed to include the above and the permissible wastages mentioned. No claim whatsoever shall be entertained on account of wastage and difference in weight as referred to above.

Issue of stores material is subject to availability and the contractor shall not be entitled to any claim or compensation for non supply or delay in the supply under any circumstances. The material will be issued generally during the working hours.

Measurement of work done and reconciliation will be done on the following basis:

**The steel shall be issued to the contractor on the following basis:**

- (a) Structural Steel : Weighment basis (Unit – MT)
- (b) Reinforcement Steel : Weighment basis (Unit – MT)

All the steel (structural, reinforcement) issued by the BHEL shall be properly accounted for. The total quantity of steel required for the work will be calculated from the approved Bar Bending schedule, fabrication drawings, approved laps and chairs. The measurement for payment as well as for accounting shall be based on the sectional weights as indicated in the following IS specifications.

IS: 808-1964 Beams, Channels and Angles

IS: 1730-1961 Plates, Sheets and Strips/Flats

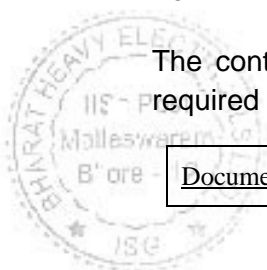
IS: 806 Steel tubes for structural purposes


IS: 1161 Steel tubes for structural purposes

IS: 1732-1971 Rounds including deformed high yield strength bars.

In case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding. The steel issued to the contractor shall be mainly in standard length and sections as received from the supplier. However, the contractor shall be bound to accept the steel in length as available in the project stores no claims for extra payment because of issue of non-standard length will be entertained. The contractor shall satisfy himself of the quality and quantity of the materials at the time of taking delivery from BHEL ISG. No claims whatsoever will be entertained by BHEL because of quality or quantity after the materials are taken by the contractor from BHEL stores.

The contractor shall submit to the engineer, a statement indicating estimated quantity of steel required during a quarter, at least two months in advance of the quarter. In addition, the contractor



	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

shall also furnish the estimated requirement of steel during a month by the third week of the previous month indicating his requirement.

Contractor is to ensure that no lamination materials are taken over by them from BHEL. Fabrication wastage, if any due to above, shall not be compensated by BHEL. Contractors to note that steel materials required for fasteners like MS/HT/HSFG bolts/nuts, lock nuts, washers and foundation bolts other than those supplied by BHEL, etc shall be supplied by the Contractors.

### RETURN OF MATERIALS

All surplus steel and all wastage materials will be taken back on weightment basis. Surplus, unused and un-tampered steel shall be sorted section-wise and returned separately for a place directed by BHEL/Engineer within the project area. Return of such materials will not be entitled to any handling and incidental charges. All wastage / scrap (including melting scrap, wastage, and unusable scrap) shall be promptly returned to the stores and a receipt obtained for material accounting purposes. Return of such material will not be entitled to any transportation and incidental charge.

### REINFORCEMENT: CONSUMPTION AND WASTAGE

#### a) CONSUMPTION:

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

- i) Actual consumption = Issue – Surplus
- ii) Surplus = Un-tampered and unused QTY of steel returned by the contractor to BHEL store along-with relevant documents
- iii) Wastage = Actual consumption – Theoretical consumption

#### b) WASTAGE:

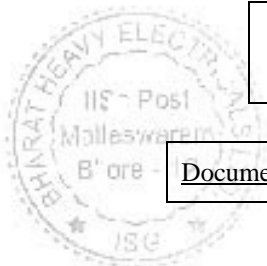
**ALLOWABLE WASTAGE:** (+5%) of the theoretical consumption shall be considered as allowable wastage.


SL. NO.	REINFORCEMENT STEEL	BASIS OF ISSUE & RECOVERY RATE
---------	---------------------	--------------------------------

Document No.: IS-01-13-2000/137

Sh. B- 18 / 47

Rev. : R0



<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

R-1	Theoretical consumption (without considering wastage and scrap or loss)	Free
R-2	Wastage limited to plus FIVE percent (+5%) of aforesaid theoretical consumption (R-1) towards allowable wastage (cut pieces plus scrap to be returned to BHEL).	Free
R-3	Wastage beyond FIVE percent (+5%) of the theoretical consumption above (R-1) (cut pieces plus scrap to be returned to BHEL).	Penal Rate

### **STRUCTURAL STEEL, (ROLLED SECTION, PLATES ETC.) : CONSUMPTION & WASTAGE**

#### **A) CONSUMPTION: -**

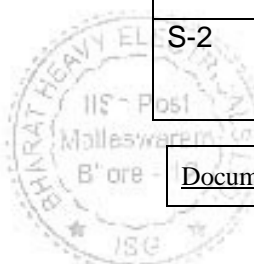
The theoretical consumption of various sections shall be based on approved drawings. Weights shall be calculated considering the sectional weights as per Indian standard. No extra shall payable to the contractor for any deviation in weights for the two different procedures adopted for issue and calculation of the theoretical consumption including rolling tolerances.


- i) Actual consumption = Issue – Surplus
- ii) Surplus = Un-tampered, unused, uncut quantity of steel returned by the contractor to BHEL store.
- iii) Wastage = Actual consumption – Theoretical consumption

#### **b) WASTAGE**

Allowable wastage: 5% (five percent) of the theoretical consumption shall be considered. Wastage shall be considered as cut pieces and scrap material, measured as per actual weightment basis. Invisible wastage, if any, shall be considered to be included in the specified 5 %allowable wastage.

<b>SL. NO.</b>	<b>CONSUMPTION OF STRUCTURAL STEEL (ROLLED SECTION, PLATES)</b>	<b>BASIS OF ISSUE</b>
S-1	Theoretical consumption (without considering any wastage, scrap or loss) as per spec. & drg.	Free
S-2	Wastage limited to plus five percent (+5%) of the aforesaid theoretical consumption (S-1) towards allowable wastage.	Free



<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

S-3	Wastage beyond five percent (5%) of the aforesaid theoretical consumption (S-1). (All wastage steel shall be returned to BHEL).	Penal Rate
-----	---------------------------------------------------------------------------------------------------------------------------------	------------

## RECONCILIATION OF MATERIALS

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

## RECOVERY OF MATERIAL

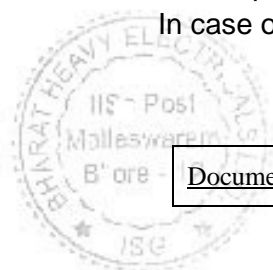
If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly R/A Bill at the Penal Rate.


## PENAL RATE OF MATERIALS

<b>A</b>	<b>REINFORCEMENT STEEL</b> Cold rolled steel, high strength deformed bar or mild steel round bars including	<b>Rs. 50,000/- per MT</b>
<b>B</b>	<b>STRUCTURAL STEEL</b> MS plates, MS flats, rolled steel joists, channels, and angles, MS pipes, Chequered Plates, etc in sizes and lengths as available.	<b>Rs. 50,000/- per MT</b>

## EXECUTION OF WORK

The work shall be executed in a workman like manner and to the entire satisfaction of the engineer and as per technical specification issued with tender, IS codes, CPWD specifications as applicable. In case of conflict, the decision of the engineer shall be final and binding.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

The engineer will communicate or confirm his instructions to the contractor in respect of the execution of the work in a “Work Site Order Book” maintained at his office and the contractor shall visit this office daily and shall confirm receipt of such instructions by signing the relevant entries in this book. Such entries will rank as order or notices in writing within the intent and meaning of these conditions.

Only BHEL ISG approved make of electrodes will be used. All electrodes shall be heated and dried in the electric electrode drying oven to the required temperature for the period specified by the engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to site will have valid manufacturing test certificates. The test certificate should have correlation with the lot no. / batch no. given on electrode packets. No electrodes will be allowed to be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved/accredited test house traceable to National / International standards should be submitted to BHEL ISG before putting the oven in use. Periodical calibration for the same shall also be arranged by the contractor within the finally accepted rates.

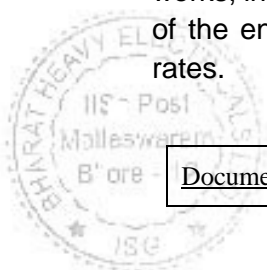
#### **SETTING OUT:**


All the works shall be set out to the true lines, grades and elevation indicated on the drawing. The contractor shall be responsible to locate and set out the works. Only one grid reference line and bench mark shall be made available for setting out the works under the contract. This reference lines shall be used as datum for the works under the contract and the contractor has to establish for his work area at available points horizontal and vertical control points. The contractor shall inform BHEL ISG well in advance of the times and places at which he wishes to do work in the area allotted to him so that suitable datum points established by him are checked by BHEL ISG/ customer to enable the contractor to proceed with the works. Any work done without being properly located may be removed and / or dismantled by BHEL ISG/ customer at contractor's expense.

The contractor shall at his own expense take all proper and responsible precautions to preserve and maintain these datum marks to its true position. In the event of these marks being disturbed or obliterated by accident or due to any other cause whatsoever, the same may be deemed necessary placed by BHEL ISG/ customer at contractor's expenses.

#### **SITE DRAINAGE**

All water including sub-soil water which may accumulate on the site during the progress of the works, including monsoon period shall be removed by the contractor from the site to the satisfaction of the engineer. All such expenditure on de-watering shall be deemed to be included in quoted rates.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

### INSPECTION AND STAGE APPROVAL OF THE WORK:

The owner or his duly authorised representative shall have at all reasonable times access to the contractor's premises or works and shall have the power to inspect drawings or any portion of the work, examine the materials and workmanship and shall have the authority to reject any work. This would be implemented through joint inspection by the representative of the owner and BHEL ISG/ third party appointed by BHEL ISG and in the form of joint protocols without any extra claims and loss of time and amount.

All work embracing more than one process shall be subject to examination and approval at each stage thereof and the contractor shall give due notice in writing to the engineer when each stage is ready. In default of such notice being received, the engineer shall be entitled to approve the quality and extent thereof at any time he may choose and in the event of any dispute, the decision of the engineer thereon shall be final and conclusive.

### UNCOVERING AND MAKING GOOD

The contractor shall uncover any part of the works and/or make openings in or through the same as the engineer may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the engineer. If any such part has been covered up or put out of view after being approved by the engineer and is subsequently found on uncovering to be executed in accordance with the contract, the expenses of uncovering and / or making opening in or through reinstating and making good the same shall be borne by BHEL ISG. In any other case all such expenses shall be borne by the contractor.

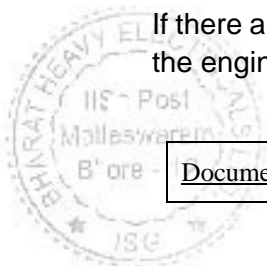
### DISCREPANCIES AND ADJUSTMENT OF ERRORS

The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawings and figures dimensions in preference to scale and special conditions in preference to general conditions.


In case of discrepancies between the specification and/or the drawings, the following order of preference shall be observed.

- Description in Scope.
- Special conditions.
- Technical specifications.
- Drawings.

If there are varying or conflicting provisions made in any one document forming part of the contract, the engineer shall be the deciding authority with regard to the document.





<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

Any error in description, quantity in schedule of quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised there in according to the drawings and specifications or from any of his obligations under the contract.

If on check there are found to be differences between the rates given by the contractor in words and figures or in the amount worked out by him in the schedule of quantities and general summary, the same shall be adjusted in accordance with the following rules:

- In the event of discrepancies between description in words and figures quoted by a Bidder, the lesser of the two will be treated as valid rate.
- In the event of an error occurring in the amount column of schedule of quantities as a result of wrong extension of the unit rate and quantity, the unit rate shall be regarded as firm and extension shall be amended on the basis of the rate.
- All errors in totalling in the amount column and in carrying forward totals shall be corrected.
- The totals of various sections of bill of quantities amended shall be carried over to the general summary and the tendered sum amended accordingly. The tendered sum so altered shall, for the purpose of tender, be substituted for the sum originally tendered and considered for acceptance instead of the original sum quoted by the bidder. Any rounding of quantities or in sections of bill of quantities or in general summary, by the bidder, shall be ignored.
- If neither drawing nor specification contain any mention of minor details of construction which in the opinion of the engineer whose decision shall be final and conclusive, are reasonable and obviously and fairly intended for satisfactory completion of work, such details shall be provided by the contractor without any extra cost, as if they were specially mentioned and shall be deemed to be included in the drawing.

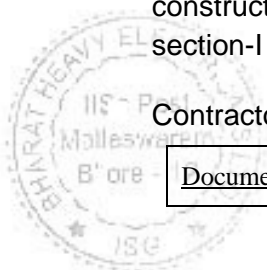
#### **SAFETY CODE:**


Besides provision with regard to safety, contractor shall note that explosives shall not be used on the work by contractor except with permission in writing of the engineer and in manner and to the extent to which he has prescribed. Where explosives are used, the same shall be stored in a special magazine to be provided by and at the cost of the contractor who shall be liable for all damages, losses and injury to any person or property and shall be responsible for complying with all statutory obligations in this respect.

The contractor will be responsible for health, safety and environment management at site for the construction activities to be carried out by them in accordance with requirements given under section-I of this tender document.

Contractor shall arrange for following provisions of HSE:

Document No.: <a href="#">IS-01-13-2000/137</a>	Sh. B- 23 / 47	Rev. : R0
-------------------------------------------------	----------------	-----------



<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

- 1) Contractor has to maintain contact with local hospital having scanning and other modern medical facilities required during emergency.
- 2) Contractor has to ensure pre-employment medical check for all staff and workers
- 3) Contractor has to ensure that adequate first aid facilities with trained nurse and ambulance are available at work site for emergency purpose. This emergency set-up should include, but not limited to following :

Male nurse (in shifts)

Oxygen set up

Breathing apparatus

Eye wash facility

Stretcher

Trauma blanket

Medicines

The ambulance is required to be arranged and maintained at site and for entire contract period for subject work by the successful Contractor. This emergency facility set up including ambulance, male nurse etc. will be shared by BHEL ISG and its other contractors working at same project in case of a need at no extra cost to BHEL ISG and its sub-contractors.

## NUISANCE

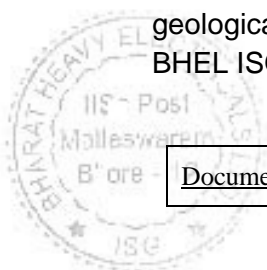
The contractor shall not at any time do, cause or permit any nuisance on site or do anything which shall cause unnecessary disturbance or inconvenience to owners, tenants or occupiers of other properties near the site and to the public generally.

## MATERIAL OBTAINED FROM EXCAVATION:


Materials of any kind obtained from excavation on the site shall remain the property of BHEL ISG/ its client and shall be disposed of as the engineer may direct at no extra cost.

## TREASURE, TROVE, FOSSILS ETC.

All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the absolute property of BHEL ISG/ BHEL ISG's client and the contractor shall take reasonable precautions to prevent his





	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

workmen or any other person from removing or damaging any such article or thing, shall immediately upon discovery and carryout the engineer's directions as to the disposal of the same.

## PROTECTION OF WORKS

Trees designated by the engineer shall be protected from damage during the course of the works and earth level within 1 meter of each such tree shall not be charged. Where necessary, such trees shall be protected by providing temporary fencing.

The contractor shall provide and maintain at his own expense all lights, guards, fencing and watching when and where necessary or required by the engineer for the protection of the works or for the safety and convenience of those employed on the works or the public.

The contractor shall have total responsibility for protecting his works till it is finally taken over by the engineer. No claim will be entertained by the engineer for any damage or loss to the contractor's works and the contractor shall be responsible for the complete restoration of the damaged works to its original condition to comply with the specifications and drawings. Should any such damage to the contractor's works occur because of other party not under his supervision or control, the contractor shall make his claim directly with the party concerned. The contractor shall not cause any delay in the repair of such damaged works because of any delay in the resolution of such disputes. The contractor shall proceed to repair the work immediately and no cause thereof will be assigned pending resolution of such disputes.

## RECORD FOR MATERIALS CONSUMED

The contractor shall maintain and furnish to the engineer the record of materials consumed in the works for each activity. The statement showing the theoretical vis-à-vis actual consumption of specified materials, such as structural steel, grouting compound, paint etc. shall be enclosed along with the running bills submitted by the contractor. Contractor has to also furnish the test results of the materials used in the work as per IS specifications.


## PROTECTION OF EMBEDMENTS BOLTS ETC.

The contractor shall ensure proper protection to the satisfaction of the engineer, of all bolts, inserts, embedment etc., from weather etc., by greasing, rapping them with gunny bags or canvas or by any other means as directed by engineer. Cost of such protections shall be deemed to be included in the rates quoted for the item.

## CLEARANCE OF SITE AND REPAIRS

Contractor has to clear the site/area where mechanical and electrical erection work is to be commenced or in progress. The contractor shall remove construction materials and equipment lying



<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

in the vicinity and causing obstruction in the erection work within 24 hours notice. In case he fails to clear the site, this will be done at his risk and cost by BHEL ISG.

## QUALITY ASSURANCE

The contractor shall submit the quality document for approval of BHEL ISG and its client as per the specification and requirement given in Technical Specification Section VI Part B, subsection Part III E.

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

## COMPLETION OF WORK

The works shall be completed to the entire satisfaction of the engineer and in accordance with the completion schedule as specified in the contract and all unused stores and materials, tools, plant, equipment, temporary buildings, site office, labour hutments and other things shall be removed and the site and work cleared of rubbish and all waste materials and delivered up clean and tidy to the satisfaction of the engineer at the contractor's expenses.

BHEL ISG shall have power to take over from the contractor from time to time such sections of the work as have been completed to the satisfaction of the engineer. Such work however shall not be treated as have been completed until the extra works are executed to the satisfaction of engineer. The guarantee period shall commence only after handing over of the entire works.

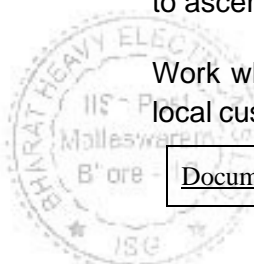
The engineer shall certify to the contractor the date on which the work is completed and the date thereof.


## RECORDS AND MEASUREMENTS

All items having a financial value shall be entered in BHEL ISG measurement book so that a complete record is obtained of all works performed under the contract.

Lump sum omissions will be entered for deduction. Measurement shall be restricted to that required to ascertain the financial liability of BHEL ISG under the contract.

Work which fails to be measured in detail shall be measured physically without reference to any local custom that may obtain excepting where it may otherwise be directed in the tender documents.



	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

The measurements shall be taken jointly by any person duly authorised on the part of BHEL ISG and by the contractor.

The engineer shall give reasonable notice in writing to the contractor of appointment for measurement.

The contractor shall, without extra charge, provide assistance with appliances and other things necessary for measurement and shall bear all the cost of measurement of his work.

Measurement shall be entered in BHEL ISG Measurement Book shall be duly signed with date by both parties each day at the site on completion of measurement. If the contractor objects to any of the measurements recorded on behalf of BHEL ISG, a note to that effect will be made in BHEL ISG Measurement Book or against the item or items objected to and such note shall be signed and dated by both the parties engaged in taking the measurement.

If, as a result of such objection, it becomes necessary to re-measure the work wholly or in part the expense of such re-measurement shall be borne by the contractor.

If the contractor's representative fails to attend when required, the engineer shall have power to proceed by himself to take measurements and in that case these measurements shall be accepted by the contractor as final.

The contractor shall, once in every month, submit to the engineer details of his claims for the work done by him up to and including the previous month which are not covered by this contract agreement in any of the following respects:

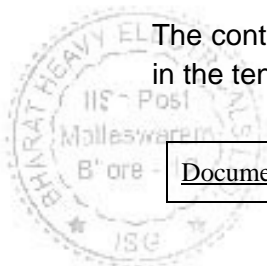
- Deviation from the items and specifications provided in the contract documents
- Extra items/new items of work
- Quantities in excess of those provided in the contract schedule
- Items in respect of which rates have not been settled


## METHOD OF MEASUREMENT

Method of measurements shall be as per standard specifications included in the tender. For other items, measurements shall be as per relevant IS codes.

## DEVIATION

The contractor shall not make any alteration in addition to or omission from the work as described in the tender documents.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## COMPLIANCE TO REGULATIONS AND BYELAWS

The contractor shall conform to the provisions of any statute relating to the work and regulations and bylaws of any local authority and of any water and lighting companies or undertaking with whose system the work is proposed to be connected. He shall, before making any variation from the drawings or the specifications that may be necessitated for such connections give the engineer, notice specifying the variation proposed to be made and the reasons therefore and shall not carry out any variation until he has received instructions from the engineer in respect thereof. The contractor shall be bound to give all notices required by statute, regulations or bye-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

## FACILITIES TO BE PROVIDED BY BHEL ISG/ CONTRACTOR

BHEL ISG shall provide free of charge limited open space, for office and storage shed, as and where made available by employer. It is the responsibility of the contractor to construct sheds, provide all utilities and dismantle and clear the site after completion of work or as and when required, as a part of his scope of work.

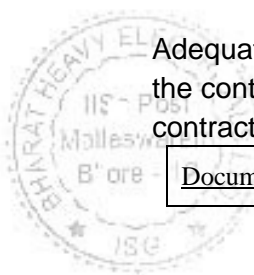
Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc., as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.


Construction power, for construction purposes will be provided by BHEL ISG free of cost and at one point mentioned. Further distribution of power shall be done by contractor at his cost. All wiring must comply with local regulations and will be subject to engineer's inspection and approval before connecting supply.

Provision of distribution lines of power from the central points to the required place with proper distribution boards observing the safety rules laid down by the authorities of the state shall be done by the contractor, supplying all the materials like cables, distribution board, switch board, TPN, CBS, ELCBS, MCCBs, Copper, brass clamps, copper conductor, change over switches, pipes etc., at his own cost. If any failure is caused in supply of the power and water, it is the responsibility of the contractor to make alternate arrangements at his cost. The contractor shall adjust his working shift / hours accordingly and deploy additional manpower if necessary so as to achieve the targets.

In case of power cuts / load shedding no compensation for idle labour or extension of time for completion of work will be given to contractor.

Adequate lighting facilities such as flood lamps, hand lamps and area lighting shall be arranged by the contractor at the site of construction, contractor's material storage area etc. Quoted rate by the contractor shall be deemed to include cost of all above work.



	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

Contractor has to arrange for construction water from underground source in **Work** area. The contractor should make arrangements for storage and distribution of sufficient quantity of water required for work. The quoted rates should include the cost of all arrangements for the said purpose. No claim in this regard is acceptable/ permitted.

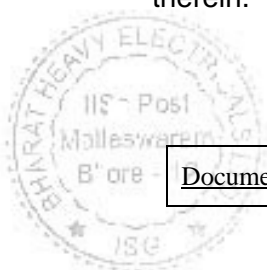
The contractor shall, during the progress of the work, provide, erect and maintain at his own expenses all necessary temporary access roads, workshops, stores, consumables, offices etc., required for the proper and efficient execution of the work. The planning, setting and erection of these buildings shall have the approval of the engineer and the contractor shall at all times keep them tidy and in a clean and sanitary condition to the entire satisfaction of the engineer. The quoted rates should include the cost of all arrangements for the said purpose. No claim in this regard is acceptable/ permitted.


On completion of work or as and when required by BHEL ISG, all the temporary buildings, structures, pipe lines, cables etc., shall be dismantled and levelled and debris shall be removed as per instruction of BHEL ISG by the contractor at his cost. In the event of his failure to do so, same will be got done by the engineer and expenses incurred shall be recovered from the contractor along with prevailing overhead. The decision of BHEL ISG engineer in this regard shall be final.

## DEVIATION

The contractor shall not make any alteration in addition to or omission from the work as described in the tender documents except in pursuance of the written instructions of the engineer. No such deviation from the work described in the tender documents shall be valid unless the same has been specifically confirmed and accepted by the engineer in writing and incorporated in the contract.

The engineer may deviate, either by way of addition or deduction, from the work so described, provided that the contract sum not thereby be varied on the whole by more than the percentage set out in the tender documents. The value of all additions and deductions shall be added to or deducted from the contract sum. Whenever the engineer intends to exercise such a right his intentions shall specify the deviations which are to be made, the lump-sum assessment or the proposed basis of payment, the extra time allowed, if any, and the date for completion of the entire contract. Any objection by the contractor to any matter concerning the order shall be notified by him in writing to the engineer within seven days from the date of such order, but under no circumstances shall the work be stopped unless so ordered by the engineer, owing to differences or controversy that may arise from such an objection. In the absence of such a notification of objection by the contractor, he will be deemed to have accepted the order and the conditions stated therein.



	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

### VALUATION OF DEVIATIONS:

Rates for deviated items or new items of work shall be as follows:

If the rates for the additional, altered or substituted work are not specifically provided in the contract for the work, the rates will be derived from the rates for a similar class of work as are specified in the contract for the work.

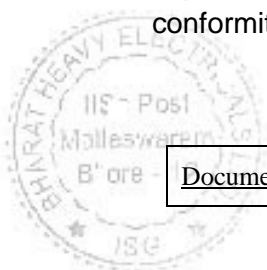
If the rates for the altered, additional or substituted work cannot be determined in the manner specified in above clauses, the rates for such part or parts will be determined by the engineer on the basis of prevailing market rates when the work was done and the decision given in this behalf shall be final and binding on the contract. Rate analysis will be worked on CPWD manual of rate analysis as guidance.

If the rates for the altered, additional or substituted work cannot be determined in the manner specified in above clauses, then the contractor shall within 7 days of the date of receipt of order to carry out the work inform the engineer of the rate at which it is his intention or charge for such class of work, supported by analysis of the rate or rates claimed, and the engineer shall determine the rate or rates on the basis of prevailing market rates and pay the contractor accordingly. However, the engineer, by notice in writing, will be at liberty to cancel his order to carry out such class of work and arrange to carry it out in such manner as he may consider advisable. But under no circumstance the contractor shall suspend the work on the plea of non-settlement of rates falling under the clause or claim any compensation on that account. Elements of profit, overheads, and supervision and establishment charges will be taken as 15% over direct cost.


### PROGRESS REPORTING

Contractor is required to draw mutually agreed monthly programme in consultation with BHEL ISG well in advance. Contractor shall ensure achievement of agreed programme and shall also timely arrange additional resources considered necessary at no extra cost to BHEL ISG.

Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled programme shall be discussed for actions to be taken for achieving targets. The programme for subsequent week shall also be presented by contractor for discussions. The contractor shall constantly update/revise his work programme to meet the overall requirement. All quality problems shall be discussed during above review meetings. Necessary preventive and corrective action shall be discussed and decided upon in such review meetings and shall be implemented by the contractor in time bound manner so as to eliminate the cause of non-conformities.





	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

The contractor shall submit weekly and monthly progress reports, materials reports, consumables (gases/electrodes) report and other reports as per proforma considered necessary by the engineer.

The progress report shall indicate the progress achieved against planned, with reasons indicating delays, if any, and shall give the remedial actions which the contractor intends to take to make good the slippage or lost time, so that further works again proceed as per the original programme and the slippages do not accumulate and effect the overall programme.

The daily manpower reports shall clearly indicate the manpower deployed, category wise specifying also the activities in which they are engaged.

## DRAWING AND DOCUMENTS

The detailed drawings, specifications available with BHEL ISG engineers will form part of this tender specification. These documents will be made available to the contractor during execution of work at site. The contractor will also ensure availability of all drawings/ documents at work place.

Necessary drawings/documents by BHEL ISG to carry out the construction work will be furnished to the contractor by BHEL ISG on loan which shall be returned to BHEL ISG engineer at site after completion of work. Contractor shall ensure safe storage and quick retrieval of these documents.

The contractor shall maintain a record of all drawings and documents available with him in a register as per format given by BHEL ISG engineer. Contractor shall ensure use of pertinent drawings / data/ documents and removal of obsolete ones from work place and return to BHEL ISG.

The data furnished in various annexure enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such large scale of work.

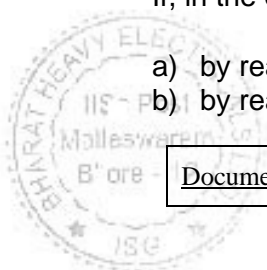
Should any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of BHEL ISG before commencement of work. BHEL ISG's interpretation in such cases shall be final and binding on the contractor.


Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct or alter any dimension / details, without specific approval of BHEL ISG.

## DELAY AND EXTENSION OF TIME

If, in the opinion of the engineer, the work is delayed:

- by reason of abnormally bad weather, or
- by reason of serious loss or damage by fire, or



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

- c) by reason of civil commotion, local combination of workmen, strike or lockout, affecting any of the trades employed on the work, or
- d) by delay on the part of the agency or tradesmen engaged by the BHEL ISG in executing work not forming part of the contract, or
- e) by reason of any other cause which in the absolute discretion of the engineer is beyond the contractor's control, then in any such case, the engineer (or higher authority) may make fair and reasonable extension in the completion dates of the individual items of work or the contract as a whole. Such extension which will be communicated to the contractor by the engineer in writing shall be final and binding on the contractor. Upon the happening of any such event causing delay, the contractor shall immediately give notice thereof in writing to the engineer but shall nevertheless use constantly his best endeavour to prevent or make good the delay and shall do all that may reasonably be required to the satisfaction of the engineer to proceed with the work.

#### **RATE SCHEDULE VARIATION**

Contractor shall fully understand description and scope of work before quoting. The scope of work and responsibility of the contractor as mentioned under this specification shall be covered within the quoted / finally accepted rates.

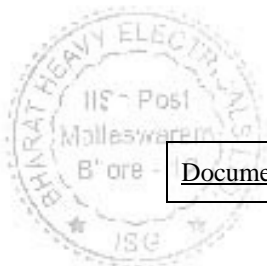
In case of any conflict in Commercial Clauses between Technical Specifications & Commercial Conditions, the Commercial Conditions shall prevail.

#### **METHOD OF MEASUREMENT**

Mode of measurement shall be as per relevant clauses of technical specification of this tender. In case the same is not available the relevant IS 1200 in conjunction of IS 3385 shall be adopted. In case the same is also not available, the standard procedure adopted in CPWD shall be adopted. In case the same is also not available in CPWD, the measurement of the work done will be based on the mutual agreement between BHEL and contractor. In all the


#### **EXTRA/ ADDITIONAL ITEMS OF WORK**

It shall be as per Clause 2.15.7 of GCC.



Document No.: <a href="#">IS-01-13-2000/137</a>	Sh. B- 32 / 47	Rev. : R0
-------------------------------------------------	----------------	-----------



	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## TERMS OF PAYMENT

### **INTERIM PAYMENTS**

For all items of works, as per the Price schedule, Vol. - III, billing shall be on item rate basis. However, Interim Payment shall be limited to 93.5% of gross bill amount.

All admissible recovered/ adjustments etc, shall be made from the interim payable

Amount.


- a) 1.5 % of gross bill amount shall be paid in the following manner on certification by BHEL engineer after compliance of each of following activity in each month. In case of non-fulfilment of respective activity by vendor in each month, no payment shall be made by BHEL against corresponding activity and no claim of bidder at a later date, whatsoever, in this regard shall be entertained by BHEL.
- b) 0.7 % shall be paid on compliance of housekeeping of vendor's working area and store /office areas.
- c) 0.3 % shall be paid on compliance of general illumination of vendor's working area and stores, office area.
- d) 0.2 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL/ PSER and as specified in the tender.
- e) 0.3 % shall be paid on compliance of applicable safety requirement as per guidelines of BHEL/ PSER and as specified in the tender.

### **RETENTION AMOUNT**

Retention Amount shall be 5% of executed contract value and shall be recovered at the rate of 5% from each Running Bill admitted, including PVC Bills.

Refund of Retention Amount shall be as follows:

- i) 50% of retention amount along with 'Final Bill'
- ii) Balance 50% of retention amount shall be retained towards 'Performance Guarantee for Workmanship' and shall become refundable after expiry of Guarantee period, provided all the defects noticed during the guarantee period have been rectified to the satisfaction of BHEL Site Engineer/BHEL Construction Manager, and after deducting all expenses / other amounts due to BHEL under the contract/other contracts entered into by BHEL with them.

<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

This portion of the retention amount can be released on commencement of the Guarantee period, on submission of equivalent Bank Guarantee.

Contractor's RA bill, complete & correct in all respects, certified by BHEL engineer, shall be paid within 30 days of receipt of bill with all supporting documents.

BHEL site at its discretion, may further split up the above percentages of break up and effect payment to suit the site condition, cash flow requirement, according to the progress of work.

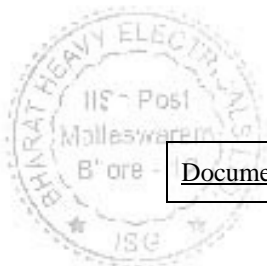
Such payment as above shall be effected only on certification by BHEL against completion of each stage.


#### **PRICE VARIATION CLAUSE (PVC)**

Applicable for this tender as per clause 2.17 of GCC

#### **OVER RUN CHARGES (ORC)**

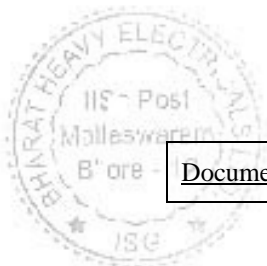
Applicable for this tender as per clause 2.12 of GCC




	<b>Technical Specifications for</b> Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## TIME OF COMPLETION AND WORK SCHEDULE

- 1.01 The entire work of Civil and Structural works as detailed in the Tender Specification shall be completed as per clause of commercial Condition of Contract.
- 1.02 Time is the essence of the contract. Contractor's particular attention is drawn to the fact that the given time schedules elsewhere in the commercial conditions for completion of this contract is firm and has to be strictly complied with.  
 The Contractor shall submit to the Owner for his approval, a detailed work schedule along with a detailed PERT network and BAR chart showing how he proposes to carry out the work at the required rate specifically mentioning time period as well as date of completion and such approved schedules must be strictly adhered to by the Contractor. The Schedules shall be reviewed periodically to ensure that the completion date will be met and to institute all corrective steps such as mobilising additional resources in terms of labour, materials, equipment, tools and plant, night work etc. at no extra cost to BHEL to achieve any accelerated progress at any time to the extent required to adhere to the completion dates. BHEL reserves the right to revise the work schedule at his discretion in order to keep up to the completion date and to suit the project requirements and such alterations shall not entitle the Contractor to any extra payment.
- 1.03 The Contractor shall furnish to BHEL with fortnightly progress reports with colour photographs in triplicate on the Saturday of every fortnight in the following format:-
- | Item | Schedule for the fortnight | Actual Progress | Reason for shortfall, if any | Steps taken to make up the shortfall |
|------|----------------------------|-----------------|------------------------------|--------------------------------------|
|      |                            |                 |                              |                                      |
- 1.04 In the event of the Contractor failing to furnish the fortnightly reports on time as detailed in above clause, the running payments shall be withheld till submission of such reports.
- 1.05 The Contractor shall not construct his stores, office sheds and labour colony etc without approval of site and demarcation of land from Client, and also the date of final completion of works shall be considered as the date when the Contractor will demolish all his temporary structures for stores, office sheds and labour colony hutments etc and clear the debris and handover the area in original good condition.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>


## TOOLS AND PLANTS

All T&Ps and MMEs are to be provided by the Contractor. Contractor has to make his own arrangement at his cost for completing the formalities (including arrangement of Road permits, if any) if required with Sales Tax/VAT authorities, for bringing their materials, plants and equipments at site for the execution of work under this contract.

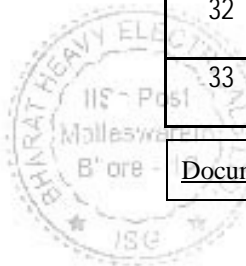
Following minimum T&P's are to be provided by bidder for execution of work at site:


Minimum requirement of equipments, instruments and tools etc., for structural and fabrication works to be provided by the contractor.

SI.No	DESCRIPTION	QTY	UNIT
1	Trucks-20 T capacity	2	No
2	Tractor with Trailer	2	Nos.
3	Tractor with Trailer – 40 feet length	2	Nos.
4	Total station (one second accuracy, digital)	2	No
5	Levelling Instruments (dumpy, laser)	4	Nos.
6	Welding Transformers	20	Nos.
7	Welding rectifier, 600/400 AMS and generator sets	20	Nos.
8	Electrode Baking Oven – Fixed Type	3	Nos.
9	Electrode Baking Oven – Portable Type	6	Nos.
10	Welding Accessories	As Required	
11	Portable Grinding Machine of various sizes	As Required	
12	All special Tools & equipment	As Required	
13	Fillet Weld measuring gauge	As Required	
14	Any other equipments, instruments, tools etc.	As Required	
15	Escort Crane – 10 T Capacity	3	Nos.

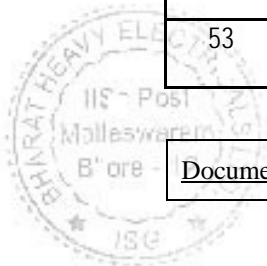
<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>


16	Escort Crane – 5 T Capacity	1	Nos.
17	Crane - 150 T Capacity – Capable of Erection up to 50-70M Height	1	Nos
18	Crane - 120 T Capacity – Capable of Erection up to 28-35M Height	1	Nos.
19	Crane – 75 T Capacity	3	Nos.
20	Crane – 40 T Capacity	2	Nos.
21	Crane tyre mounted – 75 T-150T Capacity- min.15 M Boom Length	1	Nos.
22	Jib Arm minimum 10 M length	2	Nos.
21	Hydras – 12 T Capacity	5	Nos.
22	Jeep – Car	2	Nos.
23	Diesel power generator of required capacity	3	No.
24	Portable hand held welding generator	3	Nos.
25	Pencil grinding	-	Nos.
26	Hand grinding-Min. 2.5 m long	-	Nos.
27	Buffing Tools of required size	5	Nos.
28	Plane and Milling machine --- Required capacity	2	No.
29	Electronic Plumb 10 kg & 20 kg capacity	2	Nos.
30	Illumination Dome lights and general illumination	As per requirement	
31	Marking tools etc.	As per requirement	
32	Grouting pump	2	Nos.
33	Pug cutting machine	2	Nos.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED 2x660 MW SURATGARH SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

34	Gas cutting sets	7	Nos.
35	Electric Winches 10T,5T, 3T & 1T	3	Nos.
36	Hook Chuck	3	Nos.
37	Chain Pulley Block 3 T to 10 T capacity	3	Nos.
38	Other Erection tools and tackles	As per requirement	
39	Sand blasting equipment required capacity	1	Sets
40	Spray painting equipments required capacity	2	Sets
41	Paint thickness measuring instrument	1	Nos.
42	Torque Wrench	1	Sets
43	Drilling machine --- Radial type required capacity	2	Nos.
44	Drilling machine --- Pillar type required capacity	1	Nos.
45	Drilling machine --- Hand drill required capacity	4	Nos.
46	Lathe machine required capacity	1	Nos.
47	Safety ladder for AC sheet laying required size	-	Sets
48	Safety net	As per requirement	
49	Steel tapes and measuring device	As per requirement	
50	Personal protective safety equipments for usage at work site including safety helmets, shoes, goggles etc.	As per requirement	
51	Portable fire extinguisher	4	Nos.
52	Noise level indicator	1	Nos.
53	Air quality monitoring instruments	1	Nos.

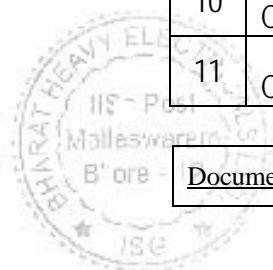



<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

54	Walkie and talkie	1	Sets
55	Emergency medical aid kits	2	Nos.
56	Welding quality control equipment such as MPI, LPI. R.T & U.T etc.	As per requirement	
57	Local stress relieving equipment	As per requirement	
58	Concrete/steel scraper for storage	1000	Nos.
59	Storage yard steel sheets	50	MT

**MINIMUM REQUIREMENT OF EQUIPMENTS,INSTRUMENTS AND TOOLS ETC.**  
**FOR CIVIL WORKS TO BE PROVIDED BY THE CONTRACTOR.**

SL NO.	DESCRIPTION	QTY	UNIT
1	L&T Poclain CK 90 Excavator	3	no
2	JCB excavator	2	No.
3	Vibratory rollers	2	Nos.
4	Plate vibrators	4	Nos.
5	Escort Crane	1	No.
6	Dumpers	6	Nos.
7	Tractor with trailer	2	Nos.
8	Concrete batching plant	1	No.
9	Transit Mixer	2	Nos.
10	Concrete pump	1	Nos.
11	Concrete mixer 7/10 Cft operated	1	Nos.



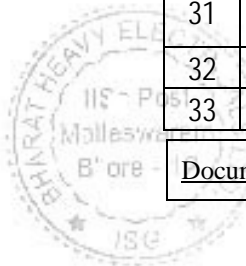
<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

12	Concrete weigh batchers	1	Nos.
13	Concrete immersion vibrators	8	Nos.
14	Air Compressors	2	Nos.
15	Concrete pressure grouting pumps	2	Nos.
16	Field testing equipment		lot
17	Compression Testing Machine	1	No.
18	Total station	1	No.
19	Levelling instruments ( dumpy, laser)	2	Nos.
20	Steel forms/Plywood	8000	Sqm
21	Steel props/steel spans/steel staging/ scaffolding pipes	100	Mt
22	Steel couplers for staging pipes	20000	Nos.
23	Builders Hoists(Electrically operated)	1	Nos.
24	Jack Hammers	2	Nos.
25	Pavement breakers	1	No.
26	Water pumps of various sizes	3	Nos.
27	Dewatering pumps of different capacities	6	Nos.
28	Welding transformers	3	Nos.
29	Water tanker	1	No.
30	Electrode baking oven-fixed type	1	No.
31	Electrode baking oven-portable type	1	No.
32	Welding accessories	as required	
33	Portable Grinding machine of various sizes	as required	


Document No.: IS-01-13-2000/137

Sh. B- 40 / 47

Rev. : R0



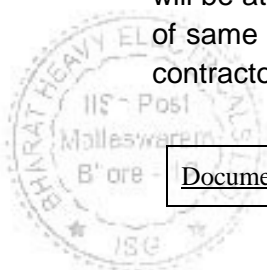



<b>BHEL-ISG</b> 	<b>Technical Specifications</b> <b>for</b> <b>Civil &amp; Structural Works – AHP Package Outside</b> <b>Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT</b> <b>UTPADAN NIGAM LIMITED</b> <b>2x660 MW SURATGARH</b> <b>SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

34	Boom Placer Min. 35 m long	1	No.
35	All special tools & equipment	as required	
36	Fillet weld measuring gauge	as required	
37	Electronic distance measuring device	1	No.
38	Spring balance	2	Nos.
39	Electric Winches	2	Nos.
40	Spray painting equipments	1	
41	Paint thickness measuring instrument	1	No.
42	Drilling machine	as required	
43	Safety net	as required	
44	Steel tapes & measuring device	as required	
45	Safety devices for usage at work site	as required	
46	Portable fire extinguisher	as required	
47	Noise level indicator	1	No.
48	Air quality monitoring instruments	1	No.
49	Walkie & talkie	3	No.
50	Emergency medical aid kits	1	Nos.
51	Portable insulated metal site office (cabin) of minimum size 35m length,5 m width,3m height with required furniture, lighting, ventilation and air conditioned space and with required doors and windows aluminium fittings etc.	1	No.
52	Portable insulated metal/plastic (sintex or approved equivalent) toilet of size 5m length,3m width,3m height with required sanitary fittings	1	No.
53	PVC (sintex or approved equivalent) water tank of 3000 litres capacity	2	Nos.
54	All other equipments, instruments, tools etc.	as required	

All T&Ps to be deployed by the contractor shall have the approval of BHEL Engineer with regard to brand, quality and specification. Providing of required Tools and plants and machinery for executing the subject work is the responsibility of Contractor.

In the event of failure of contractor to bring necessary and sufficient T&Ps & Machinery, BHEL ISG will be at liberty to arrange the same at the risk and cost of contractor including transportation cost of same from any of BHEL ISG site/place and hire charges as applicable shall be deducted from contractor's bill. Decision of BHEL ISG in this regard shall be final and binding on the contractor.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

All distribution boards, connecting cables/welding cables, wire ropes, hoses etc., including temporary air/water/electrical connectors etc., shall have to be arranged by the contractor at his own cost.

The contractor shall engage trained and experienced operators for the operation of T&P's and machinery. BHEL ISG engineer will check their skill and performance before they are allowed to operate the same. However, checking of skills by BHEL ISG does not absolve the contractor of his responsibilities for proper and safe handling of equipment, consistent good performance of operators and regular performance evaluation of operators.

The day to day and routine maintenance of T&Ps and machinery should be carried out by contractor and these shall be maintained in good working condition during the entire period of use. T&Ps in defective/damaged condition shall be rectified promptly to the full satisfaction of BHEL ISG engineer. Contractor shall maintain records for maintenance of major T&Ps which shall be made available for inspection whenever required. In case of any lapses on the part of the contractor, BHEL ISG at its own discretion get the servicing/repair of equipment done at the risk and cost of the contractor with BHEL ISG overheads.

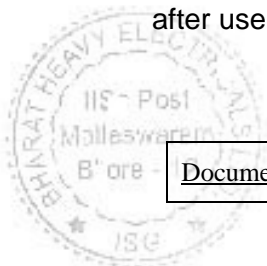
The contractor shall arrange all spares needed for upkeep of all T&Ps and machinery. For cranes, contractor shall arrange spares for repair/replacement of filter, batteries, self, dynamo, gaskets, hoses, oil seals and rubber parts.


The contractor shall permanently deploy with them minimum number of mechanics and skilled workers for undertaking the regular maintenance of tools and plants and machinery and for increasing / shortening of the crane boom as required. The contractor shall also arrange required tools, supports, consumables, illumination etc. for the above purpose.

The contractor shall arrange for consolidation of ground and arrangement of sleepers/sand bag filling etc. for safe operation / movement of equipment including cranes/trailers etc. at his cost.

In the event of BHEL ISG arranging T&Ps and Machineries at the cost and risk of contractor, any loss / damage to any part of T&Ps and machineries provided by BHEL ISG shall be to the contractor's account and any expenditure on these accounts by BHEL ISG will be recovered from the contractor's bill in case the contractor fails to make good the loss.

Further it shall be the responsibility of the contractor to take delivery of T&Ps from stores or place of use by other contractor at project site, transport the same to site and return the same to BHEL ISG store/place as intimated by BHEL ISG Engineer in project site in good working conditions after use.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

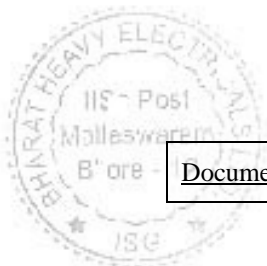
Contractor shall ensure deployment of serviced and healthy T&Ps including cranes, lifting tackles, wire ropes, manila ropes, winches and slings etc. History card and maintenance records for major T&Ps will be maintained by the contractor and will be made available to BHEL ISG engineer for inspection as and when required. Identification for such T&Ps will be done as per BHEL ISG Engineer's advice.

Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection Measuring and Test Equipment). The IMTEs shall have test/calibration certificates from authorised / Govt. approved / accredited agencies traceable to National / International standards. Each IMTE shall have a label indicating calibration status i.e., date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL ISG engineer for control.


Retesting / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL ISG Engineer within the contract price. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. Also if any IMTEs not found fit for use, BHEL ISG shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e., repeat the readings taken by that instrument, failing which BHEL ISG may deploy IMTEs and retake the readings at contractor's cost.

BHEL ISG shall have lien on all T&P, IMTEs and other equipment of the contractor brought to the site for the purpose of erection, testing and commissioning. BHEL ISG shall continue to hold the lien on all such items throughout the period of contract. No material brought to the site shall be removed from the site by the contractor and/or his sub-contractors without the prior written approval of the engineer.

The contractor shall submit month-wise T&P deployment plan. It is only to assess the capability as well as understanding of the contractor to execute the work. However it shall be the contractor's responsibility to deploy the required T&Ps, for timely and successful completion of the job, to any extent over and above those indicated in the above deployment plan (including those which are not covered in the plan submitted) without any compensation on this account.



Document No.: <a href="#">IS-01-13-2000/137</a>	Sh. B- 43 / 47	Rev. : R0
-------------------------------------------------	----------------	-----------

<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

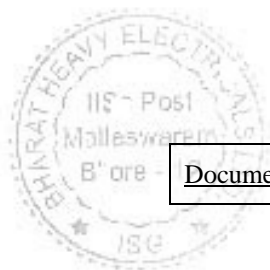
## MANPOWER REQUIREMENT

List of Minimum Requirement of Supervision Personals at site:


SL. No.	Details	Nos.	Min. Qualification	Min. yr of Experience*
1	Site-In-charge	2	B.Tech (Civil)	10
2	Engineer-in-charge for CIVIL works	2	B.Tech (Civil)	5
3	Engineer-in-charge for STRUCTURAL works	2	B.Tech (Civil)	5
4	Civil Supervisors	4	Diploma (Civil)	3
5	Structural Supervisors	4	Diploma (Civil)	3
6	Quality Supervisor	2	Diploma (Civil)	3
7	Surveyors	2	Diploma (Civil)	3
8	Quality Engineers	2	B.Tech (Civil)	5

\*Note: Min. yr of Experience shall be in the works related to the coal handling plants / bulk material handling / Steel / Power plants:

\*\* Quoted rates shall include the manpower as required; no additional claim shall be claimed by contractor



Document No.: <a href="#">IS-01-13-2000/137</a>	Sh. B- 44 / 47	Rev. : R0
-------------------------------------------------	----------------	-----------

<b>BHEL-ISG</b> 	Technical Specifications for Civil & Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House	<b>RAJASTHAN RAJYA VIDYUT  UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

## FACILITIES TO BE PROVIDED BY BHEL

### LAND

The contractor has to plan and use the existing land inside the Project Premises considering the use of land by other civil /mechanical/ electrical contractors and the storage of plant machineries and materials. The existing land shall be shared by all erections agencies. Land will be allocated with certain time frame and to the extent available/ considered necessary, and will be reviewed by BHEL depending upon the area availability.

Land for labour colony near Project Premise may be available free of cost from owner, the contractor shall construct labour colony/ hutment as per his requirements after obtaining approval of formalities from statutory body.

The contractor will be responsible for handing back all lands, as handed over to him by BHEL/MUNPL.

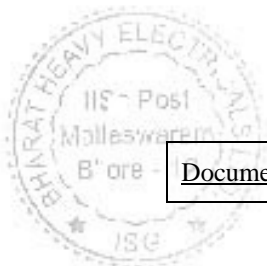
Land within plant premises for fabrication, batching plant, office, storage area etc. for construction purpose shall be provided as per availability free of cost.


### WATER

BHEL will provide construction water at one point each, at a suitable location, free of cost to the contractor. Further necessary network for construction shall be done by the bidder at his own cost. Contractor should arrange on their own, drinking water in their labour colony.

BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of water supply and the contractor shall claim no compensation for delay in work for such interruption. Contractor may make standby arrangement for water for which no separate payment shall be made by BHEL.

Contractor will have to arrange for storage of water to meet the day-to-day requirement. Bidder will ensure adequate supply of construction water (ground water reservoir of 75 cum) to meet the requirement.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED</b> 2x660 MW SURATGARH SCTPS
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

The availability of water (construction as well as drinking) in Suratgarh project may be limited. Contractor shall ensure that no water is wasted. In this regard the contractor shall take all necessary measure towards preservation of water.

## ELECTRICITY

BHEL Shall Provide Construction Power free of charge at 415V level at suitable points, bidders has to make his own distribution arrangement to draw electricity.

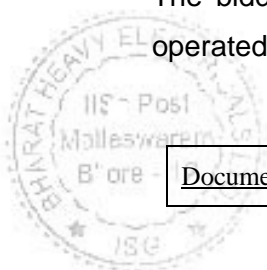
General illumination system shall be provided by BHEL. However, provision of suitable temporary lights at different working areas for execution of the work & safety of workmen shall be provided by the vendor for his specific working area, within the quoted rate. The illumination should be such that minimum illumination requirement as specified by Indian standards for general illumination is maintained.


### GENERAL:

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

In case of any major deviation from normally accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.

The bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives/ T&Ps are deployed.



<b>BHEL-ISG</b> 	<b>Technical Specifications for Civil &amp; Structural Works – AHP Package Outside Plant Boundary, Clarifier and Chemical House</b>	<b>RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED 2x660 MW SURATGARH SCTPS</b>
	<b>CIVIL SPECIFICATION</b>	<b>Volume-1 Section - A</b>

The power supply will be from the available grid. BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of power supply/ variation in voltage level and no compensation for delay in work can be claimed by the contractor due to such non-supply on the grounds of idle labour, machinery or any other grounds.

Bidder will have to arrange sufficient illumination at their own work areas.

The contractor should ensure that the work in critical areas is not held up in the event of power breakdown. In the event of breakdown in the electric supply, if the progress of work is hampered, it will be the responsibility of the contractor to step up the progress of work after restoration of electric supply so that overall progress of work is not affected.

The contractor shall have to make arrangement at their own cost for illumination that will be required in the working area for execution of the work & safety of workmen

The contractor shall have to make arrangement at their own cost for illumination etc in labour colony. However there may be provision of Chargeable Power for labour colony for which contractor has to install meters and necessary accessories

