



VOLUME - IA TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



TECHNICAL CONDITIONS OF CONTRACT (TCC)

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Chapter-I Project Information

1.0 Project Information (6 nos of Sewage Treatment Plants for Raipur Development Authority)

1	Customer	:	Raipur Development Authority, Raipur, Chhatisgarh
2	Project Title	:	Block – C package (STP no. 6) for project Civil, Structural & Architectural works for 6 nos of Sewage Treatment Plants
3	Location	:	1 no in Indraprastha -Phase-II, Raipur
Table A) Location & Capacity Details of STPs			
STP No.	Sector No.		Capacity (MLD)
STP-6	Indraprastha Scheme- Phase II		3.980
4	Address Detail	:	Indraprastha -Phase-II, Raipur, Chhatisgarh
5	Nearest Railway Station	:	Raipur Railway Station
6	Road Approach	:	Raipur
7	Nearest Air Port	:	Raipur
11	Ambient Air Temperature (Average)	:	a) Maximum : 46 ⁰ C b) Minimum : 01 ⁰ C
12	Average Relative Humidity	:	23-95 %
13	Climatic Condition	:	Humid Sub Tropical Climate

Bidder is advised to visit the project site and appraise himself about the local conditions and infrastructure available in the area for fulfilling their commitments under the contract. BHEL will not admit any claims whatsoever on account of Contractor's non-familiarization of local conditions.

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Chapter-II Scope of Works

2.0 SCOPE OF WORK

This section list major scope of work for civil, structural & Architectural works for 6 nos of Sewage Treatment Plants for Raipur Development Authority, Raipur, Chhattisgarh to be carried out by contractor, but not limited to following for safe, speedy completion of this package.

2.1 The work to be performed under the scope of this tender mainly consists of but not limited to complete Civil , Structural and Architectural work and their maintenance for specified period of the following plant buildings, structural equipment foundations and other miscellaneous structures.

2.1.1 Plant Buildings: -

- a) Raw Sewage Pump House
- b) SBR Air Blower/MCC & Control Building
- c) Chlorination cum chlorine toner room
- d) Sludge pump & blower house
- e) Centrifuge building
- f) Security cabin

2.1.2 Equipment foundations/Tank foundations: -

- 1. Receiving Chamber
- 2. Coarse screen channel (Manual & Mechanical)
- 3. Raw sewage sump
- 4. Stilling chamber
- 5. Fine screen chamber (Manual & Mechanical)
- 6. Grit chamber
- 7. SBR basins
- 8. Chlorination tank
- 9. Sludge sump
- 10. Treated Sewage Effluent tank
- 11. Diesel Generator foundation
- 12. Transformer foundation
- 13. Raw sewage pump foundations
- 14. Tonner foundation
- 15. Booster foundation
- 16. Sludge pump foundation

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17. HT substation foundation

2.1.4 Services: -

- a) Concrete paving.
- b) Pipe trenches & Cable trenches within the boundary.

2.1.5 Miscellaneous: -

- 1. Bio-filter
- 2. Paving, trenches (pipe & cable) and pipe supports
- 3. Roads and drains inside STP
- 4. Boundary wall, fencing and Gate.
- 5. Grading and Landscaping.

2.1.6 Terminal Points: -

- a) All Pipe trenches, Cable Trenches, etc. shall be terminated at boundary limit.

2.1.7 Exclusions: -

- a) Dismantling of existing pipeline
- b) Dismantling and relaying of roads at crossings

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Chapter-II Scope of Works

2.1.8 GENERAL

2.1.8.1 The drawings enclosed with this tender are intended to give the tenderer a general idea of the type and extent of work involved. The drawings are as such only indicative and not to be considered as the exact construction drawings.

Further this is to be noted that the drawings and the documents furnished along with this specification are the sole property of BHEL. It must not be used directly or indirectly in any way detrimental to the interest of the company.

2.1.8.2 The scope of work will also include such other related works although they may not be specifically mentioned in the above paragraph and all such incidental items not specified but reasonably imply and necessary for completion of the job as a whole all as desired and as directed by the engineer.

2.1.8.3 The detail scope of work covered above is not a comprehensive list of items of work involved. The detail scope of work may vary considerably depending on the actual construction requirements.

2.1.9 ALSO INCLUDED IN THE SCOPE

Unless otherwise specified, the work to be provided by the contractor for the items mentioned in the “Schedule of items”, shall include but not be limited to the following.

2.1.9.1 Furnishing all labour, materials, supervision, construction plans, equipment, supplies, transport, to and 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 handling 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.

2.1.9.2 Furnishing samples of all materials required by the engineers for testing/inspection and approval for use in the works. The samples may be retained by the engineer for final incorporation in the works.

2.1.9.3 Furnishing test reports for the products used or intended to be used, if called for the specifications or if so desired by the engineer.

2.1.9.4 Giving all notices, paying all fees, taxes etc., in accordance with the general conditions of contract, that are required for all works including temporary works.

2.1.9.5 Arranging manufacturer's supervision for items of work done as per manufacturer's specifications when so specified.

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Chapter-II Scope of Works

2.1.9.6 Carrying out topographic survey of the entire and establish levels and coordinates at suitable intervals from existing grid levels and coordinates furnished by the owner established bench marks, setting out the locations and levels of proposed structures, constructions and marking of reference pillars and other identification works etc., The contractor shall provide the owner/BHEL such a assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used.

2.1.9.7 Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract.

2.1.10 WORK BY OTHERS

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

**FOR FURTHER DETAILED SCOPE OF WORKS REFER RELEVANT
TECHNICAL SPECIFICATIONS PROVIDED IN THE SUBSEQUENT
CHAPTERS IN THE TCC**

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

S. No.	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.1	ESTABLISHMENT			
3.1.1	FOR CONSTRUCTION PURPOSE:			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with customer (BHEL Bhopal)
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with customer (BHEL Bhopal)
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipment, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc.		Yes	
f	Firefighting equipment like buckets, extinguishers etc.		Yes	
g	Fencing of storage area, office, canteen etc. of the bidder		Yes	
3.1.2	FOR LIVING PURPOSES OF THE BIDDER			
a	Open space for labour colony (as per availability)	Yes*		Can be provided as per availability on chargeable basis
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	ELECTRICITY			
3.2.1	Electricity for construction purposes of Voltage 415/440 V		Yes	
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	Electricity for the office, stores,			

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	canteen etc. of the bidder			
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc			Not applicable
a	Single point source			
b	Further distribution including all materials, Energy Meter, Protection devices and its service			
c	Duties and deposits including statutory clearances if applicable			
3.3.0	WATER SUPPLY			
3.3.1	For construction purposes			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	<u>Water supply for bidder's office, stores, canteen etc</u>			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.3	<u>Water supply for Living Purpose</u>			Not applicable
a	Making the water available at single point			
b	Further distribution as per the requirement of work including supply of materials and execution			
3.4.0	LIGHTING			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	

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

b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc. during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER			
a	Téléphone, fax, internet, intranet, e-mail etc.		Yes	
3.6.0	COMPRESSED AIR wherever required for the work		Yes	
3.7.0	Demobilization of all the above facilities		Yes	
3.8.0	TRANSPORTATION			
a	For site personnel of the bidder		Yes	
b	For bidder's equipment and consumables (T&P, Consumables etc.)		Yes	

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

Sl. No	Description PART II 3.9.0 CONSTRUCTION FACILITIES	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.9.1	Engineering works for construction:			
a	Providing the construction drawings for all the works covered under this scope	Yes		
b	Drawings for construction methods	Yes		
c	As-built drawings - where ever deviations observed and executed and also based on the decisions taken at site- example - routing of small bore pipes		YES	In consultation with BHEL
d	Shipping lists etc. for reference and planning the activities	Yes		In consultation with BHEL
e	Preparation of construction (Concreting B/W, etc.) schedules and other input requirements		Yes	In consultation with BHEL
f	Review of performance and revision of site construction schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
g	Weekly construction schedules based on S. No. e. hard copy to Construction manager, by email to HO.		Yes	In consultation with BHEL
h	Daily construction / work plan based on S. No. g. hard copy to Construction manager, by email to HO.		Yes	In consultation with BHEL
i	Periodic visit of senior official of the bidder to site to review the progress so that works is completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	
j	Arranging the materials required for Work		Yes	

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

Sl. No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
	PART II			
	3.9.0 CONSTRUCTION FACILITIES			
k	Coordination for inspection & checking and getting clearance from customer		Yes	
l	Preparation of formats for completion of activities		Yes	

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

F. LIST OF TOOLS AND PLANT:

The following tools and equipment but not limited to, are required for the efficient execution of the civil works. The contractor shall make them available for construction purposes, including all consumables likely to be used at his own cost at the time of mobilization.

S.No.	Description	Minimum Quantity	Remarks
1.	Concrete Mixer 0.25 to 0.40 cum with hopper	2 nos.	
2.	Needle Vibrator (Needle type 40mm)	4 nos.	
3.	Needle Vibrator (Needle type 25mm)	2 nos.	
3.	Surface Vibrator	1 no.	
4.	Concrete Pump	1 no.	
5.	Dewatering Pump	2 nos.	
6.	Earth Compactor	2 nos.	Need based
7.	Reinforcement steel cutting & Bending machine	2 nos.	
8.	Welding Machine	2 nos.	
9.	Grinding Machine	4 nos.	
10.	Excavator	1 no.	Need based
11.	Theodolite with staff	1 no.	
12.	Dumpy level with staff	1 no.	
13.	Compression testing machine (for concrete cubes)		
14.	Cube mould (15cm.x15cm.x15cm.)	6 nos.	
15.	Sieve analysis sieve sets for coarse & fine aggregates	1 set	
14.	Jar/Beaker for Bulk density test of sand	1 no.	

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Chapter – V: T&Ps to be deployed by BHEL on sharing basis

BHEL will not provide any tool, plants or any testing facility/apparatus for the work. It will be contractor's responsibility to arrange all required tools, plants and other testing apparatus, etc. at their own cost. The prices quoted & finalized are inclusive of the charges towards providing such T&P. No extra payment will be entertained on account of this.

However, subject to availability, BHEL may provide few T&P to the contractor for expediting and in larger interest of the project. In case any such facility is provided to the contractor, BHEL will make necessary recovery in the running account/final bills towards the hire charges. A departmental charge @ 5% will also be affected such cases. The decision of BHEL on the hire charges will be final and binding on contractor.

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Chapter-VI: Time Schedule

6.1 TIME SCHEDULE

6.1.1

The entire work of erection testing and commissioning of the Sewage Treatment Plant & their auxiliaries as detailed elsewhere in the Tender Specification shall be completed within 6 (Six) months from the date of commencement of work at site.

6.1.2

During the total period of contract, the contractor has to carry out the activities in a phased manner as required by BHEL and the program of milestone events.

6.1.3

The erection work shall be commenced on the mutually agreed date between the bidder and BHEL engineer and shall be deemed as completed in all respect only when the unit is in operation. The decision of BHEL in this regard shall be final and binding on the contractor. The scope of work under this contract is deemed to be completed only when so certified by the site Engineer.

6.2 COMMENCEMENT OF CONTRACT PERIOD

The date of commencement of contract period shall be the mutually agreed date between the bidder and BHEL engineer to start the work. In case of discrepancy the decision of BHEL engineer will be final.

6.3 MOBILISATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.,

6.3.1

The activities for Excavation, Concreting, Architectural, structural & other civil construction works, etc. shall be started as per directions of Construction manager of BHEL.

6.3.2

The contractor has to augment his resources in such a manner that following major milestones of the project are achieved on specified schedules:

TENTATIVE SCHEDULE

Activity	Tentative schedule	
	Start Month	End Month
Mobilization for Site Establishment	June'18	July'18
Plant Buildings	July'18	Sept'18
Equipment/tank foundation.	July'18	Sept'18
Reservoirs/Storage Tanks/Pits/Underground Structures	July'18	Sept'18
Services(Storm water drains, laying of sewage pipelines), etc.	Aug'18	Oct'18
Handing Over	Oct'18	Oct'18

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Chapter-VI: Time Schedule

Activity	Tentative schedule	
Mobilization for Site Establishment	Nov' 21	Nov' 21
Plant Buildings	Nov' 21	Feb' 21
Equipment/tank foundation.	Dec' 21	Feb' 21
Reservoirs/Storage Tanks/Pits/Underground Structures	Dec' 21	Feb' 21
Services(Storm water drains, laying of sewage pipelines), etc.	Mar' 21	April' 21
Handing Over	April' 21	April' 21

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

6.2 CONTRACT PERIOD

For the purpose of contract, the period shall be taken as 6 (Six) months. Completion of the work shall be as per BHEL Bar Charts revised from time to time. In order to expedite the work, the contractor has to deploy manpower on two-shift basis during erection and during pre-commissioning and commissioning period manpower should be provided round the clock basis as per site requirement without any extra cost to BHEL.

6.3 GUARANTEE PERIOD

The guarantee period of twelve months shall commence from the date of completion of all works as certified by the BHEL site engineer.

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Chapter-VIII Payment Terms

7.1

The progressive payment for the work on accepted price of contract value will be released on the basis of running account bills & other bills as per the provisions of relevant clauses of GCC and SCC.

7.2

The following documents are to be submitted along with the Running Account Bills for process of payment

- 7.2.1 Tax Invoice with details of TIN number of BHEL and contractor.
- 7.2.2 Measurement books duly filled and signed officials of BHEL and contractor
- 7.2.3 Provident Fund Remittance challan of previous month.
- 7.2.4 ESI Remittance challan of previous month.
- 7.2.5 Invoice submitted along with running bills to indicate the GST amount charged and bear the GSTIN No.
- 7.2.6 Bill submitted subsequently to be accompanied with a declaration that GST Tax liability on the earlier bill has been discharged.
 - 7.2.6.1 By paying money to the Government (along with Tax paid Challan Copy)
 - 7.2.6.2 By utilization of Input GST tax Credit

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Chapter-VIII Taxes & Duties

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Chapter-VIII Taxes & Duties

8.5 BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998.

In case any portion of work involves execution through building or construction workers, then the contractor shall ensure compliance to the above titled Acts and contractor shall obtain license and deposit the cess under the Act. In the circumstances, it may be ensured as under:-

- i. It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a license to the Competent Authority under the BOCW Act and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of license / permission to BHEL within a period of one month from the date of award of contract.
- ii. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these act and rules including that of payment / deposit of 1% cess on the extant of work involving building or construction workers engaged by the contractor within a period of one month from the receipt of payment.
- iii. It shall be the responsibility of the sub-contractor to furnish the receipts / challans towards deposit of the cess together with the number, name and other details of beneficiaries (building workers) engaged by the sub-contractor during the preceding month.

It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.

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Chapter-I General

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Part-II: Technical Specifications

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Chapter-I General

1.1

The work covered under this specification is of highly sophisticated nature, requiring the best quality of workmanship for construction, engineering and construction management. The Bidder should ensure timely completion of work. The Bidder must have adequate quantity of tools, construction aids, equipment's etc., in his possession. He must also have on his rolls adequate, trained, qualified and experienced supervisory staff and skilled personnel.

1.2

The work shall be executed under the usual conditions affecting industrial construction and in conjunction with numerous other operations at site. The Bidder and his personnel shall co-operate with the personnel of other agencies, co-ordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.

1.3

All the work shall be carried out as per the instructions of BHEL engineer. BHEL engineer's decision regarding the correctness of the work and method of working shall be final and binding on the Bidder.

1.4

The Bidder shall at his cost perform any services, tests etc, although not specified but nevertheless required for the completion of work.

1.5

Contractor shall execute the work as per sequence prescribed by BHEL at site. The sequence of activities, methodology will be decided by the BHEL engineers depending upon the availability of material, drawings, work fronts etc. No claims for extra payment from the Contractor will be entertained on the grounds of deviation from the methods and sequence of construction advised and agreed by BHEL engineer or for any reasons whatsoever.

1.6

All the necessary certificates and licenses required to carry out this work are to be arranged by the Contractor expeditiously at his cost.

1.7

The work to be carried out under the scope of these specifications covers the complete work of collection from stores/storage yard(inside the factory), handling, transporting, unloading at construction site, temporary storage at site in open/closed stores of free issue of materials (cement, reinforcement & structural steel), temporary storing of contractor's own construction material, using the same in the work, carrying out all other activities, viz. survey, excavation, concreting, backfilling, and all the other activities as defined in the scope of work enumerated in chapter-2, Part-I of TCC document, Bill of Quantities and elsewhere till handing over of the entire work. The work shall conform to dimensions and tolerances specified in the various drawings, documents etc. That will be provided during the course of installation. If any portion of the work is found to be defective in workmanship or not

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Chapter-I General

conforming to drawings or other specifications, the Contractor shall dismantle and re-do the work duly replacing the defective materials at his cost failing which the work will be got done by BHEL at the cost and risk of the contractor.

1.8

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

1.9

During the course of execution of this work, certain rework/ modification/ rectification/ repairs/ fabrication/dismantling/reconcreting etc. will be necessary on account of feedback from various other units completed earlier and also on account of design discrepancies and manufacturing defects and site operation/maintenance requirements. Contractor shall carryout such rework/ modification/rectification/fabrication/repairs etc., promptly and expeditiously. Claims of contractor, if any, for such works will be dealt as per relevant clauses of General Conditions of Contract.

1.10

Daily log sheets indicating the details of work carried out, man-hours, consumables used etc, shall be maintained by the Contractor and got signed by BHEL engineer every day.

1.11

All tools and tackles, fixtures, equipment, materials, manpower, supervisors/ engineers, consumables etc. required for this scope of work shall be provided by the Contractor. All expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause.

1.12

The contractor shall make adequate security arrangements including employment of security personnel and ensure protection from theft, fire, pilferage, damage and loss of materials/equipment issued to him for the work. Special care will have to be taken to guard against pilferage / theft of cement, steel and/or other materials.

1.13

Contractor shall ensure proper housekeeping and remove all scrap materials periodically from various work area covered in the scope and deposit the same at the place earmarked for this purpose. In case of contractor's failure to do the same, BHEL reserves the right to remove scrap at contractor's cost and risk.

1.14

Access to site for inspection by BHEL and customer engineers shall be made available by the contractor at all times.

1.15

As Built Drawings: Contractor shall be supplied with two extra copies of the layout & detailed drawings. Contractor to incorporate in one of the copy with Red ink all the changes / deviations / alterations etc. carried out at site due to various reasons, with site engineer's endorsement. Marked up drawings shall be submitted to BHEL for approval.

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Chapter-I General

1.16

Site Inspection: The owner / employer or his authorized agents may inspect various stages of work during the currency of the contract awarded to him. The contractor shall make necessary arrangements for such inspection and carry out the rectification pointed out by the owner / employer without any extra cost to the owner / employer. No cost whatsoever such duplication of inspection of work be entertained.

1.17

Field Quality Assurance Formats: It is the responsibility of the contractor to collect and fill up the relevant concrete pour card/FQA Log sheets and present the same to BHEL after carrying out the necessary checks as per the log sheets and obtaining the signature of BHEL / Customer in token of their acceptance. Monthly Running Bill Payment to the contractor will be linked with the submission of these Log sheets.

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Chapter-II: Civil and Architectural Works

2.0 SCOPE

The work will involve **all** civil, structural and architectural works connected with the above mentioned structures such as earth work, concrete work, brick work, steel work, embedment, plastering and painting, wooden and metal doors, windows and partitions, waterproofing, flooring, plumbing, road work, drainage, grouting, laying of RCC sewer lines, etc.

The scope covers all Civil and Architectural within the battery limits. The important works covered are as below:

- 2.1 Excavation of earth and backfilling including dewatering of excavations for foundations, trenches, tunnels pits, etc. till the construction of the same is completed and disposal of surplus.
- 2.2 Foundation footing for structures, trenches, tunnels, sumps, grade beams, tie beams at foundation level, grade slabs, floor slabs and roof slabs, equipment foundations etc.
- 2.3 Complete civil and architectural works such as brick work, plastering, painting, all types of floor/roof finishes, all types joinery etc.
- 2.4 Preparation and submission of detailed calculations, arrangement drawings and detail drawings of formwork, staging and scaffolding for all reinforced concrete structures and foundations as directed by the Engineer for his checking and approval.
- 2.5 Preparation of detailed working drawings and bar bending schedules for all reinforced concrete work and getting them approved by the BHEL Engineer.
- 2.6 Not used.
- 2.7 Fabrication supply and fixing of anchor bolts, sleeves, fixing frames, embedment etc. in concrete.
- 2.8 Supply of all instruments and personnel for conducting necessary tests at site as specified/as directed by the Engineer.
- 2.9 Making appropriate fabrication drawing as per agreed schedule before starting fabrication work for any structural GA drawing.

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Chapter-II: Civil and Architectural Works

2.10 Not used.

2.11 Construction of temporary storage is in contractor's scope. Storage in go-down/open yard cement and reinforcement steel, proportioning of the various concrete ingredient materials, viz. cement, fine & coarse aggregate, chemical admixtures, etc. as per the approved concrete mix design for various grades of concrete, transporting to the work location, poring the concrete in the specified formworks for foundation, column, beam, floors, etc. as the case may be as per the latest approved construction drawings & Bill of Quantities.

2.12 All other works, viz. Brickwork, Plastering, waterproofing works, backfilling, painting, etc. as defined in Bill/Schedule of quantities, construction drawings and time to time instructions issued by BHEL engineer required for completion of the work will be in the scope of the contractor.

2.13 All the works should conform to the specification provided in the Bill/Schedule of Quantities, relevant Indian Standards and best engineering practices.

2.14 Laying of RCC sewer lines including excavation, laying, jointing of pipes, road cutting, backfilling, etc. as per detailed item description of SOQ and direction and instruction of engineer-in-charge.

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Chapter-III Structural Works

3.0 SCOPE:

The works involve:

- 3.1 Temporary storage in contractor's storage cum fabrication yard allotted to them near the work area, fabrication and erection of structural steel work including all interfacing work and miscellaneous work. The nature of work shall include columns, beams, splicing of steel works as needed, bracings, purling, sheeting runners, sag rods, ties, struts walkways, galleries, stairs, ladders, handrails, floor gratings, chequered plate work , M.S, pipes, equipment supporting platforms and all other structures required for successful completion of project.
- 3.2 Not used.
- 3.3 Supply and fixing of floor gratings as per Specifications.
- 3.4 Supply of high tensile bolts, mild steel bolts, nuts, plain/taper and spring washers, all electrodes required for shop and field work.
- 3.5 Shop and final painting as per Technical Specification after properly cleaning the steel surfaces.
- 3.6 Grouting under stanchion bases.
- 3.7 All the works should conform to the specification provided in the Bill/Schedule of Quantities, relevant Indian Standards and best engineering practices.

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Chapter-IV ISSUE OF MATERIALS TO THE CONTRACTOR

All materials supply required as per BOQ is in the scope of contractor. However for expediting the work, and with mutual agreement, some materials, may be issued to the contractor in the manner as agreed either on returnable or recovery of material cost from contractor's bill. The rate of recovery as finalized by BHEL engineer will be final & binding on the contractor.

4.1 FREE ISSUE ITEMS: Nil (All materials required against respective BOQ items are to be supplied by the bidder only. Price quoted by them shall be inclusive of cost of all requisite materials).

4.2 For RMC (Ready mix concrete) items contractor has to arrange the cement quantity on their own cost. (The cement cost is inclusive in these items).

Following clauses will be applicable only when it is mutually agreed to supply some materials from BHEL stores:

4.3 It will be the responsibility of the contractor to submit his demands for stores in writing at least 7 days in advance of the actual requirements.

4.5 Issue of all stores in subject to the extent of their availability at the place of issue noted above. The contractor should bring any of the materials shown above in case the BHEL desire so. The contractor shall not be entitled to any claim or compensation for non-supply of the materials, for delay in the supply of stores under any circumstances.

4.6 The materials will be issued only during the working hours. The contractors should have to transport them to site of work at his own cost as soon as there are issued to him.

4.7 The contractor shall from time to time, render proper account of all materials issued to him by BHEL. If he fails to do so, no further issues of the materials will be made to him and he shall be held responsible for any delay in the execution of the work which may occur on this account.

4.8 Where doors, windows, pipes, fittings, specials, glass, paints or others items are issued free of cost to the contractor, the contractor will have to make good at his own cost any loss or damage to part or whole of the items issued to him as above.

4.9 All surplus material in good condition whether issued free of cost or on cost recovery basis and which are not returned to the BHEL Central Stores and also quantities of materials consumed in excess of the actual requirements shall be charged for at punitive rates which will be 100% more than the issue rates of BHEL. The decision of the Senior Engineer / Civil as to the extent to which the materials have been rendered surplus or

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-IV ISSUE OF MATERIALS TO THE CONTRACTOR

have been consumed in excess of the actual requirements shall be final and binding on the contractor.

4.10 For the purpose of determining the actual requirement of cement, the theoretical consumption of cement as per Delhi Schedule of Rates 2012 of CPWD will be considered by BHEL Engineer. For items not covered in DSR 2012, the consumption will be calculated based on the technical specification & similar items of DSR. The decision of BHEL engineer in this regard will be final and binding on the contractor.

4.11 The contractor shall construct store shed for storing cement, at his own cost and required site will be shown by the engineer-in-charge. Contractor shall store cement as directed by the Engineer-in-charge and shall maintain the record by entering day to day consumption and receipts. The contractors shall dismantle the temporary shed as soon as completion of work. Final bill will be forwarded subject to above conditions and certification by stores in charge of factory civil department.

~~4.12 BHEL expenses for scrapping will be recovered from the contractor if the contractor has charged~~

4.13 Steel (reinforcement/structural steel) will be issued at lengths as stocked by the Bharat Heavy Electricals Limited. The surplus steel is represented by the difference between the quantity received and the quantity required and utilised on the work with an allowance of 5% towards scrap. The scrap will be the property of the contractor; the contractor will be responsible for the removal from the site in time as directed by the Senior Engineer / Civil. The cut pieces and surplus returned shall not be shorted than three meters in length.

4.14 Excess consumption of structural steel/reinforcement steel over the actual quantities of materials consumed in excess of the actual requirements as per design/drawing shall be charged for at punitive rates which will be 100% more than the purchased rates of BHEL (i.e., @ Rs. 84,000/ton) after allowance of 5% towards scrap, will be recovered. The scrap material has to be returned to scrap yard BHEL against SDN (Scrap delivery note).

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-V LIST OF TECHNICAL SPECIFICATIONS

5.0 PREAMBLE TO THE SCHEDULE OF QTS. (SOQ) PROVIDED IN PRICE BID SPECIFICATION

5.1 Details of the items in this Schedule shall be read in conjunction with the corresponding BHEL specifications, drawings and other documents and shall have precedence over any contrary statement mentioned anywhere in this document.

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

5.3 Items of work provided in this schedule but not covered in the specifications shall be executed strictly as per instructions of the Engineer.

5.4 Unless specifically mentioned otherwise in the contract, the bidder shall quote his rates for the finished items and shall provide for the complete cost towards fuel, tools, tackle, equipment, constructional plant, temporary works, labour materials, levies, taxes, transport, layout, repairs, rectification, maintenance till handing over, supervision, shops, establishments, services, temporary roads, revenue expenses, contingencies, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the works according to the contract.

5.5 The rate quoted shall be inclusive of cleaning the site of any vegetations, dressing and leveling etc., required for commencement of site activities. No separate payment will be made towards the same.

5.6 The rate shall also be inclusive of carrying out topography survey of site to establish levels and coordinates at suitable intervals, form existing grid levels and coordinates furnished by the owner, establish bench marks, setting out the location and levels of the proposed structures, constructions and making references, pillars and other identification marks etc. No separate payment will be made towards the same.

5.7 The quantities of the various items mentioned in the schedule are approximate and may vary up to any extent or be deleted altogether. The quoted rates of each item shall remain firm irrespective of any variation in quantities. The contractor, in his own interest, should get an indication of the probable extent of the

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-V LIST OF TECHNICAL SPECIFICATIONS

work to be executed under any particular item in this schedule, before, under taking any preliminary work or purchasing bought out component related to the work.

- 5.8 Rates shall be quoted both in figures and in words in clear legible writing. No over writing is allowed. All scoring and cancellation should be counter signed by the bidder. In case of illegibility, the interpretation of the engineer shall be final. All entries shall be in English language.
- 5.9 Payments will be made on the actual quantity of work executed against each SOQ item.
- 5.10 Engineers decision shall be final and binding on the contractors regarding clarification of items in this schedule with respect to the other section of the contract.
- 5.11 Unless otherwise specified in the schedule of items, cement, structural and reinforcement steel will be in the scope of contractor.
- 5.12 Cement shall be procured from reputed manufacturers such as L&T, ACC, Gujarat Ambuja, Cement Corporation of India, Vikram, J.P. etc. and as approved by the Employer, Ministry of Industry, Government of India and holding license to use BIS certification mark for their product, whose name shall be got approved from Engineer In-charge.
- 5.13 Steel shall be procured from main producers such as SAIL, TISCO, RATHI or as approved by the Ministry of Steel.
- 5.14 In case of any discrepancy between item description, relevant drawing and/or specification clarification shall be sought at tender stage itself. Otherwise it shall be assumed that the bidder has quoted for the more stringent requirement.

5.15 HIERARCHY

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

- Statutory Regulations
- Items in Schedule of quantities
- IS/BS standards
- BHEL's standard specification (with prior approval of Engineer-in-charge).
- CPWD's technical specification

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-V LIST OF TECHNICAL SPECIFICATIONS

LIST OF TECHNICAL SPECIFICATIONS (Annexure-I)

SL. NO .	DESCRIPTION	SPECIFICATION NUMBER	REV	PAG ES
1	GENERAL SCOPE.	PEDC/STD.SPEC/001	0	4
2	PROPERTIES. STORAGE&HANDLING OF COMMON BUILDING MATERIALS.	PEDC/STD.SPEC/002	0	5
3	EARTHWORK INEXCAVATION & BACKFILLING.	PEDC/STD.SPEC/003	0	23
4	CEMENT CONCRETE-PLAIN& REINFORCED.	PEDC/STD.SPEC/004	0	56
5	FABRICATION & STRUCTURAL STEEL WORK.	PEDC/STD.SPEC/005	0	25
6	ERCTION OF STRUCTURAL STEEL WORK.	PEDC/STD.SPEC/006	0	15
7	MISCELLANEOUS STEEL WORK.	PEDC/STD.SPEC/007	0	5
8	MISCELLANEOUS METAL.	PEDC/STD.SPEC/008	0	6
9	PAINTING ON STRUCTURAL STEEL.	PEDC/STD.SPEC/009	0	5
10	INSERTS / EMBEDMENTS IN CONCRETE WORK.	PEDC/STD.SPEC/010	0	3
11	GROUTING.	PEDC/STD.SPEC/011	0	4
12	MASONRY & ALLIED WORKS.	PEDC/STD.SPEC/012	0	8
13	FINISH TO MASONRY &CONCRETE.	PEDC/STD.SPEC/013	0	7
14	PAINTING, WHITEWASHING, POLISHING ETC.	PEDC/STD.SPEC/014	0	11
15	FLOOR FINISHES & ALLIED WORKS.	PEDC/STD.SPEC/015	0	26
16	GLASS & GLAZING.	PEDC/STD.SPEC/016	0	3
17	METAL DOORS,WINDOWS, VENTILATORS, LOUVERS ETC.	PEDC/STD.SPEC/017	0	10
18	ROLLING STEEL SHUTTERS & GRILLS.	PEDC/STD.SPEC/018	0	4
19	ROOF WATER PROOFING, INSULATION & ALLIED WORKS.	PEDC/STD.SPEC/019	0	9
20	FALSE CEILING.	PEDC/STD.SPEC/020	0	5
21	WATER SUPPLY WORKS.	PEDC/STD.SPEC/022	0	11
22	DRAINAGE & SANITATION.	PEDC/STD.SPEC/023	0	17

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Chapter-V LIST OF TECHNICAL SPECIFICATIONS

23	SUPPLY & LAYING RCC PIPES.	PEDC/STD.SPEC/024	0	4
24	PREMOULDED BITUMINOUS JOINT FILLER & SEALING COMPOUND.	PEDC/STD.SPEC/025	0	2
25	DEMOLITION & DISMANTLING.	PEDC/STD.SPEC/026	0	5
26	TYPE & MAKE OF MATERIALS TO BE USED.	PEDC/STD.SPEC/027	0	2
27	FALSE FLOORING.	PEDC/STD.SPEC/028	0	4
28	WATER BOUND MACADAM.	PEDC/STD.SPEC/030	0	7
29	RUBBLE MASONARY.	PEDC/STD.SPEC/031	0	4
30	CHAIN LINK FENCING.	PEDC/STD.SPEC/032	0	3
31	SHEETING WORK IN ROOF F / SIDING.	PEDC/STD.SPEC/033	0	4
32	TANK PADS.	PEDC/STD.SPEC/034	0	5
33	ANTI TERMITE TREATMENT.	PEDC/STD.SPEC/036	0	4
34	PILING.	PEDC/STD.SPEC/040	0	
	(A) PART I - PREAMBLE.	PEDC/STD.SPEC/0040 -a	0	2
	(B) PART II - GENERAL SPECIFICATIONS.	PEDC/STD.SPEC/0040 -b	0	4
	(C) PART III - SPECIFIC REQUIREMENTS.	PEDC/STD.SPEC/0040 -c	0	8
	(D) PILING PART-IV – MATERIAL FOR REINFORCED CONCRETE PILES	PEDC/STD.SPEC/0040 -d	0	8
	(E) PILING PART-V TESTING OF CONCRETE PILES	PEDC/STD.SPEC/0040 -e	0	11
35	ALL RELEVANT BHEL SPECIFICATIONS			

NOTE: The above technical specification is not exhaustive. In case for any item of work, technical specification is not available, such items of works will be carried out in conformance to technical specification of CPWD/manufacturer's recommendations/best engineering practice. In case of any dispute between two specifications or non-availability of specifications, customer's specification will prevail. Decision on applicability of any particular specifications will rest with BHEL engineer and his decision in the matter will be final & binding on the contractor. Contractor has to make himself well conversant with the Customer specification.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Chapter-VI LIST OF DRAWINGS

LIST OF DRAWINGS (Annexure-II)

S. NO.	TITLE	DRAWING No.	REV. NO.
1	PLOT PLAN *	0-38101-01169	R3
2	ALL RELEVANT BHEL DRAWINGS.		

“*” – Plot plan enclosed is not final and likely to change to meet BHEL’s requirements.