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VOLUME - IA

Technical Conditions of Contract (TCC) for General Civil Works

FOR

Demonstration of Methanol Firing in One GT at NTPC Kayamkulam

BHARAT HEAVY ELECTRICALS LIMITED

	Technical Conditions of Contract (TCC) **PROJECT ENGINEERING & SYSTEMS DIVISION** **HYDERABAD**	Ref No: HY/PE&SD/SC-PROJECTS/2024-25/TCC/ NTPC-Kayamkulam/ GeneralCivil/01, Rev.00 Rev. No. 00

TECHNICAL CONDITIONS OF CONTRACT (TCC)

FOR

GENERAL CIVIL WORKS

FOR

Demonstration of Methanol Firing in One GT at NTPC Kayamkulam

Revisions: Refer to record of revisions	Prepared By:	Checked By:	Approved By:	Date
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Volume IA
Part I
Contract Specific Details

Chapter I- Project Information

1.0 Project Details			
1	Customer	:	NTPC, Kayamkulam, Kerala
2	Project Information	:	Demonstration of Methanol Firing in One GT at NTPC Kayamkulam
3	Location	:	Kayamkulam, Kerala
4	Address Detail	:	Choolatheruvu, Haripad in Alappuzha district, Kerala, India
5	Nearest Railway Station	:	Cheppad halt RS, Harippad RS
6	Road Approach	:	38KM towards South from District Head quarters
7	Nearest Air Port	:	Trivandrum International airport (Approx. 110.0 Km), Kochi International Airport (Approx. 99.0 Km)
11	Ambient Air Temperature (Average)	:	a) Maximum : 30^0 C b) Minimum : 25^0 C
12	Average Relative Humidity	:	73%
13	Climatic Condition	:	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.

Chapter II- Scope of Work

1. Filling, cutting, levelling and grading: Earthwork, cutting, filling and levelling in proposed NTPC plant area.

2. Micro Grading:
The entire area shall be micro graded up to required levels by the contractor to achieve the ground profile as per pavement level requirement. Filling/ cutting required to bring the site up to the required finished levels is in the scope of the contractor.

3. The work to be performed under the scope of this tender mainly consists of but not limited to complete **underground civil works** including excavation for foundations, backfilling, leveling and grading, Piling, pile cap works, RCC foundation works and their maintenance for specified period of the following steel structures, equipment foundations and other miscellaneous structures and services.

4. Construction of Dyke wall, cable trench, pipe trench, foundation, pedestal etc including providing and installing foundation bolts, templates, inserts, lugs, pockets etc for equipment foundation and structure foundations etc. as per drawings.

5. **Piling and foundation work:** The work will involve:

a) Installation & Testing of 500 dia. bored cast-in situ piles of approximately 21m long from pile cut-off. Pile cut-off length shall be about 2m from NGL. Final Approved Drawings shall be given during execution.

b) The scope will cover all works, connected with installations and Testing of Bored Cast-in-situ piles including mobilizations of rigs and other equipment, their erection/ dismantling/ transportation/ assembling and erecting from one area to another within the plant, preparation of firm ground/MS plates as required for supporting the pile rigs, supply of materials, sampling and testing of materials consumables, labors, transportation etc. All work as required for the proper and satisfactory completion of the job.

c) SAFE LOAD CARRYING CAPACITY:

The pile safe load capacities shall be as below :

Pile dia	-	500mm
Safe Vertical load capacity	-	46 MT (approx.)
Safe lateral load carrying capacity	-	2.5 MT (approx.)
Pull out capacity	-	18 MT (approx.)

d) Concrete:

Concrete shall be of minimum M-30 grade with minimum strength of 30 N/mm2 at

28 days. The other concrete specification shall be as per relevant clauses of standard specification for construction & installation of bored cast-in-situ piles.

e) Cement:

Cement shall be Ordinary Portland cement with C3A content from 5 to 8 percenet/ Portland slag cememnt confirming to IS 455 having more than 50% slag. Minimum cement content shall be 370 kg/m3 and maximum water cement ratio shall be 0.45 for foundation works other than pile works and for pile works minimum cement content shall be 400 kg/m^3.

f) Reinforcement:

Reinforcement steel shall be High strength deformed bars and should be corrosion resistance thermo-mechanically treated (CRS-TMT) bars and shall confirm to Grade Fe-500 of IS:1786 with minimum percentage of elongation of 14.5%.Clear Cover to the reinforcement shall be 60mm.

g) INSTALLATION:

Installation of piles shall be carried out in accordance with pile layout drawings which shall be available to the contractor at the time of execution of work.
Cutoff level of the piles shall correspond to those given in the working drawings. For broad guidance, however, this may be assumed as 2.0 m below the NGL.
To ensure dense and sound concrete up to the cut of level, concreting shall extend up to 1000mm, above the cut off level.
In case the reinforcement cage is made up of more than one segment, the same shall be assembled by welding only before lowering as per IS: 456 by providing necessary laps.
The vertical reinforcement shall project 50times its diameter above he cutoff level.

h) CONSTRUCTION:

Bored cast-in-situ piles

The construction of piles shall be in accordance with the provision of bhel

standard specification.

The borehole sides shall be stabilized using direct and circulation technique. The concretion shall be done by termite observing all necessary precautions and producers as per IS: 2911 part-1 section 2 provisions. The final clearing of the borehole byres mud circulation must be accomplished just prior to commencement of concretion by tremie. The quality of drilling and used shall be checked as per latest IS: 2911 part-1 section 2 provisions and shall be replaced if it does conform to the same.

The concreting shall be proceed immediately after completion of the drilling and cleaning process of the borehole.

The concrete shall be placed by a tremie of suitable diameter. All precaution for obtaining clear and sound pile shaft be strictly observed.

For treime concreted piles, a sample of drilling fluid shall be taken from the base of borehole by means of an approved sampling device in the first few piles and at suitable intervals of piles thereafter. Concrete placing shall not proceed if density of fluid exceeds 1250kg/m3. The sand content in the fluid shall not exceed seven percent.

To ensure dense and sound concrete up to cutoff level concreting shall be extended for length of 1000mm above the cut off level. However, no extra payment shall be made for this and quoted rate shall be inclusive of this.

i) DEFECTIVE PILES :

Defective piles shall be removed or left in place and replace by additional piled as directed by the engineer-in-charge at no additional cost.

j) PILE TESTING:

Type of loading test

Initial loading test

1) prior to commencement of the job piling, initial vertical and lateral tests shall be carried out on separate test piles cast for the purpose. The number of tests in each category shall be as given n schedule of quantities.

2) the contractor shall be allowed to proceed with the job piping only after successful completion of the various initial piles load tests to the satisfaction of the engineer-in-charge.

Routine load tests

The number of tests in each category shall be as given in schedule of quantities. The piles for he various tests shall be randomly selected by engineer-in-charge.

Pile load test

For various tests, the test set up shall be as "specification for testing of concrete Piles.

All testing shall be done by the cyclic/direct loading test in minimums eight stages as per the relevant clause of "specification for testing of concrete piles"

Each stage of loading for various tests should be maintained till the rate of movement of piles isles than 0.02mm/hr. however, this rate is not permitted to be extrapolated for 24rs. And settlements shall be observed every hr. during this period.

Maximum test loads for various tests shall be as follows:

1) Initial vertical pile load tests-load corresponding to a total settlement of 10% of pile dia. Or 3 times the pile vertical load capacity which ever occur earlier.

2) Initial lateral pile load tests-load corresponding to 12mm total deflection.

3) Initial pull out test.

Thrice the estimate safe uplift load on respective pile or until the load displacement curve shows clear beak (downward trend) whichever occurs earlier.

4)Routine vertical load test-1.5 times or load corresponding to 12mm total settlement.

5) Routine lateral load test-pile lateral capacity or load corresponding to total deflection of 5mm

K) CRITERIA FOR ASSESSMENT OF SAFE LOADS:

Safe vertical load

It shall be the latest of the following:

-2/3 of final load at which the total settlement attains a value of 12mm.

-50% of the total at which load at which the total settlement equate 10% of the pile diameter.

The criteria for the safe load form routine load test shall also be the same.

Safe lateral load

Safe lateral load shall be the latest of the following:

-50% of the final load at which the pile deflection attains a values of 12mm

-Final load at which the total pile deflection corresponds to 5mm.

The criteria for the safe load form routine load test shall also be the same.

Safe up lift load

Safe up lift load on pile shall be the latest of the following:

1)Two-third of the load at which the total displacement attains a value of 12mm.
2)Half of the load at which the total displacement curve shows a clear break. (downward trend)

A full record of pile load tests results shall be submitted to the engineer-in-charge immediately on completion of each test. The record shall also include the plots of load-settlement and time-settlement (for various stage of loads) characteristics of pile and also the interpretation of the pile load test curve as per criteria for safe loads as mentioned in clause (K) of "Specification Requirements". Further it should also include driving record of tested piles. Any special observations shall be duly explained by the contractor.

L) RATE:

1. • Rate to be quoted for piles shall be inclusive of all equipments, labour and materials (excluding reinforcement) including boring, bentonite slurry, concrete , chipping of excess concrete over cut off length, disposal of surplus earth , used slurry and debris, shifting of plant and equipment from pile to another one etc, complete.

2. Rate for providing reinforcement to be quoted separately as per SOQ.

M) MEASURMENT OF PILES

The piles shall be measured and paid for the actual pile length from pile tip to cut-off level, given in the working drawings or as indicated by the engineer-in-charge. No extra payment shall be made for empty up to cut-off-level of 1.50mm below N.G.L or for concrete cast above cut-off-level (ref.clause-h)

If actual cut-off-length as per construction drawing is more than 1.50mm form N.G.L, payment for boring beyond 1.50m will be made.

Reinforcement will be measured as per actuals and paid for by weight as a separate item

6. Construction of following services

i). Strengthening of existing roads if required.
ii). Maintenance and erection approach roads/ by strengthening of roads.
iii). Preparation of As built drawing for construction, and getting approval of the same from PMC/ Owner/ Licensor.
iv). Any temporary activities required to complete the work.
v). Approval from statutory and local authorities to complete the work.
vi). The plot for construction area/ fabrication yard/ field office/ construction stores has to be developed by the contractor of its own and the Client shall only identify the space on as in where is basis. All the infrastructure facilities, which include roads, approaches, drainage system, pavements etc., shall be developed & provided by the contractor of its own. (if required)

7. Work shall be executed as per the instructions of BHEL site engineer. In case of any dispute, decision of BHEL site engineer shall be final and binding on contractor. For detailed scope of work, please refer chapter 1, part-II of this TCC
8. Royalty for Coarse & fine aggregates for the concrete used quantity used at site.
9. Local issues if any should be resolved by the contractor
10. Dewatering as and when required as per the site condition should be carried out by the contractor.

Chapter III- Facilities in the scope of BHEL/Contractor

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	
b	Open space for storage (as per availability)		Yes	
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 labor colony (as per availability)		Yes	
b	Labor Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	**ELECTRICITY**			
3.2.1	Electricity For construction purposes		Yes	Electricity shall be provided by BHEL/NTPC at one point on chargeable basis. Further distribution shall be done by contractor.
3.2.2	Electricity for the office, stores, canteen etc. of the bidder		Yes	
3.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc.		Yes	
3.3.0	**WATER SUPPLY**			

S. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.3.1	For construction purposes		Yes	Water shall be provided by NTPC at one point on chargeable basis. Further distribution shall be done by contractor.
3.3.2	Water supply for bidder's office, stores, canteen etc.		Yes	
3.3.3	Water supply for Living Purpose		Yes	
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	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 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	

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**		Drawing schedule shall be finalized at the time of kick off meeting
b	Drawings for construction methods			NA
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 are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two Weeks.		Yes	
j	Arranging the materials required for Work		Yes	
k	Coordination for inspection & checking and getting clearance from customer		Yes	
l	Preparation of formats for completion of activities		Yes	
3.10	**Work Permits, gate pass etc. from customer for manpower, machinery and material**		Yes	

Chapter IV- Tools & plants to be deployed by Contractor

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 batching plant (Stationary/Movable)	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 x 15cm x 15cm)	6 nos.	
15.	Sieve analysis sieve sets for coarse & fine aggregates	1 set	
14.	Jar/Beaker for Bulk density test of sand	1 no.	
15.	Mobilisation of TMR(Truck Mounted Lattice Mast Hydraulic operated) piling rigs	1 no.	For Piling works

BHEL will not provide any tool, plants, facilities 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 because 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.

Chapter V- Time Schedule

5.1 TIME SCHEDULE

5.1.1
The entire work detailed elsewhere in the Tender Specification shall be completed within **06 Months** from the date of commencement of work at site.

5.1.2
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.

5.1.3
The work shall be commenced on the mutually agreed date between the bidder and BHEL engineer. 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.

5.2 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.

5.3 MOBILISATION

5.3.1
The activities for "General Civil Works" shall be started as per directions of Construction manager of BHEL.
5.3.2
The contractor should mobilize manpower in order to complete the work in **06 Months.**
5.3.3
Requisite Material, men and machinery should be arranged in order to complete the project within stipulated time.
5.3.4
The contractor has to augment his resources in such a manner that following major milestones of the project are achieved on specified schedules:

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

5.4 CONTRACT PERIOD

For the purpose of contract, the period shall be taken **as 06 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 as per site requirement without any extra cost to BHEL.

5.5 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.

5.6 PROTECTION OF WORK

The contractor shall have total responsibility for protecting his works until it is taken over by the Employer. No claim will be entertained by the Employer or the representative of the Employer for any damage or loss to the Contractor's works and the Contractor shall be responsible for complete restoration of the damaged works to original conditions to comply with the specification and drawings. Should any such damage to the Contractor's Works occur because of other party not being under his supervision or control, the Contractor shall make his claim directly with the party concerned.

If disagreement, conflict, or dispute develops between the Contractor and the other party or parties concerned regarding the responsibility for damage to the Contractor's Works the same shall be rectified. 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.

Chapter VI- Statutory Regulation

6.1 GST: For All types of works excepting works covered under sl no 6.2

6.2 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 and

INTER-STATE MIGRANT WORKMEN ACT, 1979 (IN CASE BIDDER ENGAGE MANPOWER FROM OTHER STATE)

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

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/or ISMW Act as applicable 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.

It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these acts and rules including that of payment / deposit of cess as per the applicability under above referred Acts within a period of one month from the receipt of payment.

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/Inter-state Migrant workmen) 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.

Chapter VI- Field quality control plan

1. Work shall be executed as per approved field quality control plan (FQCP).
   Tentative FQP Attached.

Chapter VIII: HSE (Health, Safety, Environment) and PPE (personal Protective Equipment) Guidelines

1. Contractor shall follow all the HSE guidelines as mentioned NTPC Safety Management **(Annexure-II)**
2. Contractor shall deploy one (1) number of qualified and experienced safety officer for the entire period of contract.
3. Contractor shall submit the biodata of safety officer to BHEL/Customer (NTPC), for approval.
4. In case of any dispute/ contradiction, NTPC HSE rules and guidelines shall prevail.

Volume IA
Part II
Technical Specification

SCOPE OF WORK

1.0

The work to be performed under the scope of this tender mainly consists of construction of Methanol tank foundation (piling and pile cap), Dyke wall, DV shed other miscellaneous structures for pipe supports cable tray etc., installation & testing of 500mm dia bored cast-in situ piles of approximately 21m long from pile cut-off. Pile cut-off length shall be approx. 2.0m from FGL. In addition to above, dismantling of existing RC dyke wall (one side only -approx. 20m long & 1.5m high), Retrofitting of existing dyke wall with new dyke wall, pipe supports, barbered wired fence etc.,

The scope will cover all works connected with installations and Testing of Bored Cast-in-situ piles including mobilizations of rigs and other equipment their erection/dismantling/transportation/assembling and erecting from one area to another within the plant, preparation of firm ground as required for supporting the pile rigs, supply of materials, sampling and testing of materials consumables, labours, transportation etc. all complete as required for the proper and satisfactory completion of the job.

For location of tank and dyke wall refer plot plan. Please note that these are tentative locations and likely to change as per approved construction drawings.

10.1.1 Piling work for following tank

i. Methanol Storage Tank (approx. 7.0m dia & 9.0m height). The pile shall be 500mm dia. Bored cast-in situ of approximately 21m long from pile cut off level which is approx. 2.0m below ground level.
ii. For carrying out pile load tests, i.e. compression, lateral & pullout contractor has to make arrangement of loads like concrete blocks, jack, dial gauges etc. Also machinery such as crane, hydra or any other suitable equipment for placement of concrete blocks etc. shall be provided by the contractor as per site conditions. The loading for pile load test shall be carried out as per the relevant IS standard/ Customer specification/ mutually agreed by the customer. No separate payment shall be given for placement concrete blocks and allied equipment for pile load test as well as machinery, trailer etc. required in facilitating placement of concrete blocks and allied equipment for carrying out pile load tests.

10.1.2 Buildings

i. DV shed

10.1.3 Foundations for the following Equipment, pits and tanks

i. Methanol Storage Tank (approx. 7.0m dia & 9.0m height)

10.1.4 Construction of following services

i. RC Dyke wall
ii. RCC Paving inside Dyke area
iii. Pipe supports
iv. RC approach roads, drains
v. Pipe Crossings for piping etc.,
vi. Maintenance and erection approach roads/ by strengthening of roads.
vii. Preparation of basic/ detailed engineering drawings for construction, and getting approval of the same from PMC/ Owner/ Licensor.
viii. Any temporary activities required to complete the work.
ix. Approval from statutory and local authorities to complete the work.
x. The plot for construction area/ fabrication yard/ field office/ construction stores has to be developed by the contractor of its own and the Client shall only identify the space on as in where is basis. All the infrastructure facilities which include roads, approaches, drainage system, pavements etc. shall be developed & provided by the contractor of its own.

10.1.5 Dismantling

i. Dismantling of existing dyke wall (one side – approx 20m length, 1.5m height and 200mm thk.)
iii. Existing RC Pipe supports
iv. Existing Barbed wire fence

10.1.6 Retrofitting

i. Retrofitting of New and Old dyke wall joint along height of wall using pressure grout and water proofing along the joint.

2.0 THE WORK WILL INVOLVE.

All civil, and structural connected with the above mentioned structures such as earth work, piling work, concrete work, brick work, steel work, embedment, plastering and painting, dismantling, waterproofing, grouting etc.

3.0 EXCUSION:

-NIL-

4.0 CIVIL WORKS

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

a) Excavation of earth and backfilling including dewatering of excavations for foundations, dyke walls, pipe supports, etc. till the construction of the same is completed and disposal of surplus.

b) Construction of Bored cast -in-situ piles

c) Construction of RCC pile caps with ring wall, foundation footing for loaded structures, dyke wall etc.

d) 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.

e) Preparation of detailed working drawings and bar bending schedules for all reinforced concrete work and getting them approved by the BHEL Engineer.

f) Fabrication and fixing structural steelwork.

g) Fabrication supply and fixing of anchor bolts, sleeves, embedment etc. in concrete.

h) Supply of all instruments like Dumpy Level, Total Station, measurement tapes etc and personnel for conducting necessary tests at site as specified/as directed by the Engineer.

i) Making appropriate fabrication drawing as per agreed schedule before starting fabrication work for any structural GA drawing.

5.0 GENERAL

a) The drawings enclosed with this tender are intended to give the tenderer a general idea of the type and extent of work involved. The drawings are as such only indicative and not to be considered as the exact construction drawings.
Further this is to be noted that the drawings and the documents furnished along with this specification are the sole property of B.H.E.L. It must not be used directly or indirectly in any way detrimental to the interest of the company.

b) 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.

c) 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.

6.0 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.

a) 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 provide by the engineer during the course of works.

b) 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.

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

g) On completion of work, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and leveled and debris shall be removed as per instructions of BHEL by the contractor at his cost. In the event of his failure to do so, the expenditure towards clearance of the same will be recovered from the contractor. The decision of BHEL Engineer in this regard is final

7.0 WORK BY OTHERS

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

TECHNICAL SPECIFICATIONS & DRAWINGS FOR INFORMATION.

SECTION	***DESCRIPTION***
SECTION – A	**LIST OF TECHNICAL SPECIFICATIONS**
SECTION – B	**LIST OF TENDER DRAWINGS**

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

SECTION-A

LIST OF TECHNICAL SPECIFICATIONS.

SECTION-A.

LIST OF TECHNICAL SPECIFICATIONS

SL.NO.	DESCRIPTION	SPECIFICATION NUMBER	REV	PAGES
1	GENERAL SCOPE.	PEDC/STD.SPEC/001	0	2
2	EARTHWORK INEXCAVATION & BACKFILLING.	PEDC/STD.SPEC/003	0	19
3	CEMENT CONCRETE-PLAIN& REINFORCED.	PEDC/STD.SPEC/004	0	55
4	FABRICATION & STRUCTURAL STEEL WORK.	PEDC/STD.SPEC/005	0	25
5	ERECTION OF STRUCTURAL STEEL WORK.	PEDC/STD.SPEC/006	0	15
6	MISCELLANEOUS STEEL WORK.	PEDC/STD.SPEC/007	0	5
7	MISCELLANEOUS METAL.	PEDC/STD.SPEC/008	0	5
8	PAINTING ON STRUCTURAL STEEL.	PEDC/STD.SPEC/009	0	5
9	INSERTS / EMBEDMENTS IN CONCRETE WORK.	PEDC/STD.SPEC/010	0	3
10	GROUTING.	PEDC/STD.SPEC/011	0	4
11	MASONRY & ALLIED WORKS.	PEDC/STD.SPEC/012	0	8
12	FINISH TO MASONRY &CONCRETE.	PEDC/STD.SPEC/013	0	7
13	PAINTING, WHITEWASHING, POLISHING etc.	PEDC/STD.SPEC/014	0	11
14	ROOF WATER PROOFING, INSULATION & ALLIED WORKS.	PEDC/STD.SPEC/019	0	9
15	PREMOULDED BITUMINOUS JOINT FILLER & SEALING COMPOUND.	PEDC/STD.SPEC/025	0	2
16	DEMOLITION & DISMANTLING.	PEDC/STD.SPEC/026	0	5
17	50mm THK PREMIX BITUMINOUS CARPET (HOT PROCESS) OVER WBM ROAD SURFACE.	PEDC/STD.SPEC/029	0	4

18	TANK PADS.	PEDC/STD.SPEC/034	0	5
19	CONCRETE PAVEMENTS.	PEDC/STD.SPEC/035	0	11
20	PILING.	PEDC/STD.SPEC/040-a	0	
	(b) PART II - GENERAL SPECIFICATIONS.	PEDC/STD.SPEC/0040-b	0	4
	(c) PART III - SPECIFIC REQUIREMENTS.	PEDC/STD.SPEC/0040-c	0	6
	(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
	(f) PILING PART-VI -CONSTRUCTION AND INSTALLATION OF RCC BORED CAST IN-SITU PILES	PEDC/STD.SPEC/0040-f	0	8

SECTION-B

LIST OF DRAWINGS

SECTION-B

LIST OF DRAWINGS

S.NO.	TITLE	DRAWING No.	REV. NO.	COPY TO PESR
1	PLOT PLAN (TENDER PURPOSE ONLY)	PY-LE-1-M231-2012-01	00	PDF
2	ALL RELIVANT NTPC SPEC & STD. DRAWINGS	CS-0011-130A-9	-	PDF
3	WORKING PILE (TENDER PURPOSE ONLY)	PY-DZ-1-M231-1201-01	00	PDF

PREAMBLE FOR THE SCHEDULE OF QUANTITIES.

PREAMBLE TO THE SCHEDULE OF QTS. (SOQ)

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

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.

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

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

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.

7) Void

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.

9) 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.

10) In case of any discrepancy between item descriptions, 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.

HIERARCHY

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

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

ANNEXURE- I

WEB BASED CONTRACTORS' LABOUR INFORMATION AND MANAGEMENT SYSTEM [CLIMS] IN NTPC.

INTRODUCTION:

NTPC has implemented an in house 'captive private cloud' based solution; **'Contractors' Labour Information Management System (CLIMS)**' to streamline the labour management processes, to ensure physical and social welfare of workers, statutory compliances and to get accurate picture of real time availability of workers. It has also resulted in proper keeping of records in a digitalized format and ensuring that the wages and other benefits of labour deployed at NTPC Plants are disbursed correctly and in time.

The **CLIMS application** also has inbuilt features like bio-metric attendance, medical fitness, safety training/ clearances, ESI registration and other regulatory checks. CLIMS is designed to automate several time-consuming processes in a contract involving labour force, including wage sheet processing for contractor's labour and statutory reporting and archival. The application covers the management of information of contractors and their work contracts including management and control of contractor's labour force; their work timings, wages, welfare, safety and health concerns. While the contractor retains ownership of labour data and enjoys full control over labour attendance, work timing, wages etc., system provides real time information windows to concerned NTPC officers like Engineer-in-charge, HR and safety department etc. for ensuring compliance of labour laws and labour welfare.

Pre-set Workflows have been incorporated in CLIMS wherein labour can enter the plant only after the requisite safety training and medical clearance. It is not only a labour information and attendance system but a system spanning bigger objectives of economic development, social justice and safety & welfare of labour. The administration of CLIMS since its rolling out has proven a game changer by all means. The digital transformation achieved through CLIMS in management of contractors' workers has tremendously benefitted all its stakeholders. It is institutionalized in NTPC and is running successfully at 47 projects ensuring and ascertaining social security, welfare and financial stability to thousands of workers.

SALIENT FEATURES OF CLIMS:

1. **Repository of Contracts' data, Work' data and Workers' data:** CLIMS keeps information of all types of work contracts including the contracts of project construction, regular operation or periodic maintenance. The database keeps record of the contractors, their works or contracts; single or multiple, and the labour registered by the contractors against each contract. The system also keeps record of workers' medical fitness, safety training, skill training, training requirements, safety clearances and several other regulatory checks. A completely digital data repository of workers' data is maintained which includes workers' addresses, qualifications, designation, skills, bank account details, nominees, PF/ESIC numbers etc.

2. **Workers' Biometric data:** Biometric authentication employing face detection or finger print identification ensures that there will be no unlawful entry and each entry and exit will also be immediately recorded. Biometric authentication system at all entry and exit points. This has further helped in strengthening the security of the power plants.

3. Authentication of Workers' for access control and attendance: Labour authentication at plant gates and automated attendance of contractors' labour form an important part of CLIMS. Plant gates are fitted with biometric face or finger authentication systems. All the contractors' workmen registered in the CLIMS database have a workman ID and their finger prints and face matrix are captured and recorded by the authentication machines. All the authenticating machines at the gates are connected to the central database of CLIMS through Intranet and the in-out timing of labour at all gates is stored in the central

database in real time.

4. Wage sheet preparation: Wage sheets of workers are automatically generated by CLIMS application using the attendance data of workers received from biometric machines. This feature makes it possible to handle millions of numbers in a few minutes and prepare accurate wage sheets of workmen without any manual slogging. This also helps in processing of wages as per statutory guidelines and bringing transparency in wages paid to workers based on their actual attendance. Contractors, EIC, Finance and HR personnel can review the attendance and wage sheets of workers using their CLIMS portal login account. This is the most important feature of CLIMS which helps in faster wage sheet generation, statutory compliances, faster HR clearance and helps in ensuring wage payment on the last day of the Month.

5. Data Management: Contractors are primarily responsible for maintaining correct data of their labour force in CLIMS. Each contractor gets its own login and password to work in CLIMS. Contractor details, assigned work and worker details are filled into the CLIMS web application by contractors using their CLIMS login. Complete details of workmen are captured and stored in the system including their permanent address, emergency contacts, education level, designation & skill level, category, insurance details, EPF, UAN, ESI-IP Number, bank account details, PMJJY and PMSBY data etc. Photographs of workers and scanned identity documents are also uploaded. Contractor uploads all the required forms and documents into the CLIMS repository to get clearance of labour entry inside the plant premise.