

Corrigendum 8 dated September 07, 2021 to Tender Specification BHEL PSSR SCT 1979 for the works of Part A: Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney and Part B: Providing, installing and handing over of two covered coal sheds covering three coal stock piles using tubular steel sections conforming to IS 1161 / IS 4923 and Steel structural sections conforming to IS 2062-2006, Roof monitor if required shall be provided on full length as per the requirement. Scope is inclusive of Design, supply, fabrication, welding, handling, assembling & erection in position of tubular space frame structure or Steel framed structure, cladding sheets (roof and side sheeting) and handing over to customer (as per specification) At 2 X 660 MW Ennore SEZ TPP (Unit 1 and 2)

I. The following Note is added in Annexure-1A to NIT, "PRE QUALIFICATION CRITERIA/REQUIREMENT – Technical"

Note 5: In case, where BHEL has awarded a particular work to Main Vendor and the Main Vendor in turn has awarded, the work awarded by BHEL in part / full to a sub vendor (known as bidder); and the bidder has now quoted to BHEL for the said tender floated by BHEL, citing the above work as a pre-qualification experience.

In such situation as above, the following documents shall be scrutinised by BHEL before qualifying the bidder.

- i. Work Order from BHEL's main vendor in the name of bidder, indicating scope of work, Order value & Completion period.
- ii. Completion certificate issued by BHEL's main vendor, indicating the Scope, Duration of work & Quantum of work completed.
- iii. Copy of BHEL letter according permission by BHEL to sublet the work from BHEL's Main vendor to bidder.
- iv. TDS certificate and any one of the documents in the name of bidder for the plant, like Labour license / BOCW registration / Workmen compensation insurance / Gate Pass for material or for T&P and Gate Pass for labour / any other relevant documentary evidence.

The bidder shall be disqualified if any one of the above points (i to iv) are not satisfied.

II. Some of the Bidders had raised queries on the published tender Specifications. The clarifications are furnished below:

Sl. No.	Reference clause of Tender Document	Bidder's query	BHEL's clarification
1.	Volume-II, Price Bid Part C : Bill of Quantities pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A", Items at Ref. Nos. 208(a), (b) and A208 (a), (b)	Item No.208 (a), (b) and A208 (a), (b) specifies that it is including UPV testing. Also, item no. 210 specifies that it is extra for UPV testing. Hence, our understanding is that, there will not be any reduction in rate when UPV testing is carried out in item no. 208 (a), (b) and A 208 (a), (b) instead it will be paid vide item no. 210. Please clarify.	Item 208 & 208A are inclusive of price for conducting UPV testing. Therefore, item no. 210 shall not be applicable for Items 208 & 208A. Hence, item description for item no. 210 is modified. Kindly refer Price Bid Revision 01.

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Sl. No.	Reference clause of Tender Document	Bidder's query	BHEL's clarification
2.	Volume-II, Price Bid Part C: Bill of Quantities pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A", VENTILATION SYSTEM FOR CHIMNEY Item at Ref Nos.: 1.0 to 1.5	Please provide the Specification & List of approved make	Kindly refer Price Bid Revision 01. Items for Ventilation system for chimney are omitted in the Price Bid Revision 01. Therefore, Specification & List of approved make is not applicable.
3.	Volume-II, Price Bid Part C : Bill of Quantities pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A", CHIMNEY WORKS Item at Ref. No.: 66.0 Supplying and erecting after approval by Engineer an Elevator from ground upto top of chimney with landing at various platform level complete as per spec. and drawings	Please provide the Technical Specification, Drawings & List of approved make	Technical specification attached as Annexure – A to this Corrigendum. Drawing for elevator to be furnished by bidder for approval by BHEL/customer. Bidder is requested to refer Price Bid Revision 01 for modified item description for clarity. List of approved make is not available, bidder to take prior approval from BHEL/Customer before procurement.
4.	Volume-II, Price Bid Part C : Bill of Quantities pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A", Items at Ref. Nos 401, 402, 402A, 16(i)(a), 16(B)(b), 404, 16(a)(i)(a), 16(a)(ii)(a), 16(a)(ii)(b)	Item no 402A & item no 16(i)(a), 16(B)(b) specifies that transportation of reinforcement from BHEL stores and contractors supply of reinforcement for Item no 401 & 402 and Item no 16 A (ii)(a) which includes cutting, bending, and placing in position including contractor's scope of providing MS binding wire. Also, Item no 404 specifies that extra over 401, 402, 402A for providing fusion bonded epoxy coating to BHEL supply of reinforcement steel and also contractor supply of reinforcement steel as per Item no 401 & 402 including supply of PVC coated binding wire. Our understanding is that there will not be any reduction in rate in Item No. 401, 402 & 402A for not providing MS binding wire, when PVC coated binding wire is provided as	Contractor has to supply the binding wire under items 401, 402 & 402A. Item No. 404 is Extra over ST No. 401, 402, 402A for providing fusion bonded epoxy coating and providing PVC coating on binding wire. Refer Price Bid Revision 01 for modified item description of Item No. 404 for clarity.

Sl. No.	Reference clause of Tender Document	Bidder's query	BHEL's clarification
		per Item No 404 for fusion bonded epoxy coating. Please clarify.	
5.	Volume-II, Price Bid Part C : Bill of Quantities pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A", Item at Ref. No. 2301 (b)	<p>I) During our site visit, we noticed that in the Power House Building, in Grid 1 to 5, almost 85% Erection works has been completed by the existing contractor. Kindly confirm if the remaining 15% works will also be completed by the BHEL existing contractor, or it will be in our scope.</p> <p>II) Also, in Grid 20 to 23, almost 50% Erection works has been completed by the Existing Contractor. Kindly, confirm if the remaining 50% works will also be completed by the BHEL existing contractor, or it will be in our scope.</p> <p>III) In item no. 2301 (b) of the Price Bid, there is quantity of 10, 619MT for erection of fabricated structural steel material.</p> <p>We request you to kindly confirm if the quantity mentioned in the BOQ is correct.</p>	For I) & II), Bidder has to execute all the balance scope of works on ""As is where is basis"" since the scope of tender pertains to completion of Balance works. For III), Bidder to quote as per BOQ quantity.
6.	Volume-II, Price Bid Part C : Bill of Quantities pertaining to "Scope of Works-Part B" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_B", Item at Ref. No. Item No 1	In the execution of Coal sheds, please confirm if the scope of works includes the civil works for the coal shed, such as foundation, finishing and flooring works etc.	Scope of works for Coal shed is excluding civil works of foundation, finishing and flooring works. For detailed scope of work for Part-B bidder is requested to refer Clause 2 of General Technical specification for Covered Coal Shed (Vol IA Part-II: Technical specifications Chapter-3)
7.	Volume-II, Price Bid Part C : Bill of Quantities pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A", Item at Ref. No. A1501	In Item no. A1501 having quantity of 5,257 sqm and weightage is 0.000207. We feel that the weightage given for this item is very less.	Weightage is revised. Kindly refer Price Bid Revision 01.

III. Price Bid Revision

Price Bid published as Volume II of Tender BHEL PSSR SCT 1979 stands DELETED.

Price Bid-Revision 01, Volume II of Tender BHEL PSSR SCT 1979 is attached as Annexure-B to this Corrigendum.

Annexures:

- 1) Annexure A: referred at Sl. No. 3 above.
- 2) Annexure B: Price Bid-Revision 01, Volume II of Tender BHEL PSSR SCT 1979

ALL OTHER CONDITIONS REMAIN UNCHANGED.

BIDDERS ARE REQUESTED TO CONSIDER THIS CORRIGENDUM AS PART OF TENDER SPECIFICATION AND QUOTE ACCORDINGLY.

-Sd-

(Gurupriya L)
Manager/SCT

**Annexure A to Corrigendum 8 dated September 07, 2021 to
Tender Specification BHEL PSSR SCT 1979**



**SPECIFIC TECHNICAL REQUIREMENT
STACK ELEVATORS**

SPECIFICATION NO.PE-TS-Q11-503-A-001	
VOLUME II B	
SECTION C	SUB-SECTION A6
REV. 0	
SHEET 1 of 5	

**SECTION - C
SUB SECTION – A6**

STACK ELEVATORS



**SPECIFIC TECHNICAL REQUIREMENT
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SPECIFICATION NO.PE-TS-Q11-503-A-001

VOLUME II B

SECTION C **SUB-SECTION A6**

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1. SYSTEM DESCRIPTION

1.1 The Rack and pinion type stack elevator is required for installation inside multi-flue or outside single flue chimney. The stack Elevator is normally used for the movement of the maintenance personnel and for materials such as refractory bricks, etc. for maintenance of chimney.

2. SCOPE OF SUPPLY AND SERVICES

2.1 The scope of supply and services covered under the specification are broadly described below:

2.1.1 One No. Rack and Pinion type stack elevator complete with all other accessories and associated steel work.

2.1.2 Drive motor and control panel for Stack elevator

2.1.3 Control Panel

2.1.4 Equipment earthing

2.1.5 All power and control cables, trailing cables

2.1.6 Limit switches

2.1.7 Over speed governor

2.1.8 Alarm push button in the cage connected to battery operated alarm at elevator base.

2.1.9 Reverse phase relay connected to prevent operation of the cab with improper phase rotation or failure in any phase of power supply.

2.1.10 Continuous duty electrical torque motor recoil cable reels or cable trolley or any equivalent arrangement to maintain electrical power service to all electrical components of the elevator for complete travel of stack elevator.

2.1.11 One auxiliary panel shall be provided and mounted on the graded level enclosure equipped with a main ON-OFF selector switch, main contactor, breaker, relays, control transformer and fuses, tone frequency transmitter or equivalent arrangement, , terminal blocks and all other accessories required for normal operation of the elevator.

2.1.12 One main control panel shall be furnished and mounted on top of the cab. Panel shall be in enclosure equipped with necessary equipment like rectifier, battery charger charger, tone frequency receiver, contactors, breakers, control transformer and fuses, thermal overload relays, and all other equipment and accessories required for normal operation of the elevator.

2.1.13 Cab shall be controlled by semi-automatic floor selection control system. Cab shall be furnished with 240 V grounding receptacle, emergency alarm push button with normally open contact, indicating light, limit switches, and all other necessary control devices required to ensure safe and continuous cab operation. One trailing cable shall connect the main control panel to aux. Panel at ground level. Cable shall supply the cab necessary power supply requirements. Cable guides shall be installed at every 6 m intervals to avoid entanglement of this cable. Control signal between the aux. Panel at ground level, the main control panel on the cab and the landings shall be provided with tone frequency receiver or any other equivalent arrangement by trailing control cable.



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- 2.1.14 Each landing assembly shall include a limit switch and push button control station installed and wired to a landing junction box.
- 2.1.15 All power cable and race way shall be provided and installed by the bidder for interconnection of the main control panel, auxiliary panel and landing junction boxes. Trailing cables shall be as per relevant IS/IEC standard.
- 2.1.16 Bidder shall provide, install and connect a system equipment ground to owner's chimney grounding system. Equipment grounding system shall electrically connect panels and junction boxes which contain electrical devices, motors and elevator platform and structures. Raceway system shall not be considered as an equipment ground.
- 2.1.17 All enclosures containing electrical devices shall be provided with 240 V, single phase heaters with adjustable thermostat control.
- 2.1.18 Cab shall be equipped with a 240 V AC interior light and duplex outlet.
- 2.1.19 Cable accessories as required to install the cables in bidder's scope shall be provided by the bidders.
- 2.1.20 Complete erection, testing and commissioning including all erection materials, consumables and other tools and tackles required for erection along with commissioning spares.
- 2.1.21 All inserts, anchor bolts, sleeves, anchoring steel and any other items required to complete the job satisfactorily shall be in bidder's scope.
- 2.1.22 First fill of lubricant and consumables shall be in bidder's scope.
- 2.1.23 Satisfactory running and maintenance of elevator for a continuous period of 30 days including training of owner's operators.
- 2.1.24 Supply of One complete set of special maintenance tools and tackles shall be in bidder's scope.
- 2.1.25 Any other equipment or accessories not specified, but required for the satisfactory operation of chimney elevator shall be in bidder's scope.
- 2.1.26 Recommended spares including instrumentation for 3 years of normal operation of stack elevator. (List to be furnished by the bidder and for which order shall be placed separately by owner as per their requirements)



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3. SPECIFIC REQUIREMENTS

- 3.1 The equipment supplied, erected and commissioned shall meet the technical requirements of respective Section –D and Data Sheet-A.
- 3.2 Bidder shall note that all QP and Field quality plans shall be subject to purchaser's approval.
- 3.3 All equipment offered shall have suitable provision of termination and connection of power and control cables inclusive of cable boxes, lugs and glands, etc.
- 3.4 All the equipment shall be suitable for the power supply fault level and other climatic conditions as indicated in project information.
- 3.5 The bidder shall guarantee the rating and performance parameters of the system/equipment offered in accordance with specification requirements.
- 3.6 It is the responsibility of bidder to arrange license for operation of chimney elevator from statutory body of that area before handing over.
- 3.7 Bidder shall furnish deviation (clause wise) in the deviation schedule. In absence of duly filled deviation list, it will be presumed that offer is exactly in line with the technical specification.
- 3.8 Bidder shall furnish duly filled data sheet –B along with the offer. In absence of same, offer shall be treated as incomplete.
- 3.9 Bidder shall offer the stack elevator considering prevailing statutory and regulatory requirements of project location.
- 3.10 Bidder shall indicate degree of protection of various electrical equipment in the offer.
- 3.11 Makes of all bought out items shall subject to purchaser's approval after award of contract.
- 3.12 All drawings/documents shall subject to purchaser's approval after award of contract.
- 3.13 Please refer/ comply customer/ specification (*rack & pinion type elevator* CHAPTER: 20 Page no. Vol-III-713 TO Vol-VI-98)



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DATA SHEET

- | | | | |
|----|---|---|--|
| 1 | Designation
Elevator | : | Rack and Pinion type Stack |
| 2 | Type of loading | : | Passenger/goods |
| 3 | Quantity | : | As per project requirement |
| 4 | Carrying Capacity | : | 400 Kg |
| 5 | Operating Speed | : | 0.7 m/min (Approx) |
| 6 | Dimension of lift and lift well/cut out | : | As per IS:3534 |
| 7 | No. of landings | : | Eight (8) nos. including ground.
(0.0 m, 35m, 70m, 105m, 145m,
185m, 225m, and 265m) |
| 8 | Total vertical travel | : | 265m. |
| 9 | Electrical power supply system | : | 415 V, 3 ph, 3 wire, 50 Hz |
| 10 | Other accessories | : | As required |

CHAPTER 20**20.0 ELEVATORS****20.1 Scope**

20.1.1 Scope covers design, engineering, fabrication, installation, commissioning and testing of elevators listed below.

20.1.2 The required equipment and services shall be as described below:

20.1.2.1 One (1) no. rack & pinion type stack elevator of 500 kg capacity complete with all other accessories and associated steel works for 275 m high **chimney**.

20.1.2.12 Electrical equipment such as motors, starters, switches, switch gears, control panels, interlocks, control & power cabling and earthing of electrical equipment.

20.1.2.13 Any other equipment or accessories not specified here in but required for the satisfactory and safe operation of the Elevator shall also be included in scope of work.

20.2 Rack & Pinion Elevators**20.2.1 Design Criteria for Rack & Pinion Elevators**

20.2.1.1 Elevator shall be located outside the RCC stack, ~~Crusher house CRH-1, TT-5 & JTB-5~~ and shall be capable of operating from the ground floor to the top interior platform with intermediate stops at all interior platforms.



- 20.2.1.2 All mechanical and electrical operating devices and trailing cable shall be designed for operation indoors with dusting and high humidity conditions and shall operate equally well in any ambient temperature from 75°C to 10°C. Additionally, all mechanical and electrical components of the elevator shall be designed to withstand without damage a temperature of 100°C when the elevator is not operating.
- 20.2.1.3 Elevator shall be attached to the chimney shell using anchor bolts supplied and installed into the chimney shell by the contractor.
- 20.2.1.4 Design and Operational Requirements
- 20.2.1.4.1 Design and operation of the stack elevator shall comply with the following requirements:
- i. Carrying capacity (kg) : 400 (minimum)
 - ii. Operating speed (m/min) : 40
 - iii. Cab floor size (inside) (mm) width x length : 1100x1100 (minimum)
 - iv. Landing levels (Nos.) : Minimum 22 (at all internal platform levels) (landing platform shall be provided)
 - v. Landing elevations : As per requirement
 - vi. Total vertical travel (m) : 275.0
 - vii. Electrical power supply system : 415 Volts, 3 phase, 50 Hertz
 - viii. Type of loading : Passenger cum goods



20.2.2 **Equipment Specifications for Rack & Pinion Elevators**20.2.2.1 **Enclosures**

A three-sided enclosure with one access door shall be provided for ground landing. At each platform landing above ground level, a one-sided enclosure with access door shall be provided. Enclosures shall be fabricated from tubular steel and expanded metal or wire mesh of suitable height and primer coated with coats of the manufacturer's standard primer and finish paint. The ground landing shall be provided at a suitable height above the foundation slab to ensure a safety space underneath the cage. The space under the landing shall be surrounded by foundation enclosure. The staircase, bolted to the door front, shall be provided for access to the cage. Enclosure access doors shall be electrically and mechanically interlocked so that they remain closed and locked except when the cab is at a landing. Doors shall be bi-parting and swinging.

Base of the three sided enclosure shall be securely anchored to the ground level floor slab using expansion type anchors.

20.2.2.2 **Mast**

Mast shall be provided in flat sections of suitable length, consisting of tubular sections and/or structural shapes welded together to form a frame work to which the rack is bolted. Mast shall be securely anchored to the concrete chimney walls.

20.2.2.3 **Cab**

- a. Cab frame shall be fabricated from tubular steel and enclosed with expanded metal or wire mesh.
- b. Cab floor shall be of skid resistant chequered plate or fibreglass reinforced plywood or approved equivalent. Cab shall be attached to a framed structure and form an integral part with the drive mechanism located atop the cab.
- c. Framed structure shall include guide rollers and safety hooks to ensure positive engagement of the rack and pinions to prevent cab disengagement in case of roller failure.
- d. Cab roof shall be provided with an escape hatch electrically interlocked with the hoist control system. Tubular steel handrail shall enclose the cab roof for maintenance operations.
- e. Cab door and landing level enclosure doors shall be electrically and mechanically interlocked to prevent the cab from being operated unless the cab door and landing level enclosure doors are fully closed and to prevent the doors from being opened while the cab is in motion.

20.2.2.4 **Drive Units & Safety Device**

- a. Drive unit shall be located on top of the cab. It shall be a compact with pinion engaging into the rack of the mast. The pinion shall be mounted on a key joint & fitted to the secondary shaft of the worm gear which shall be driven by a AC squirrel cage induction motor.

Drive unit shall incorporate an Electro Hydraulic Thruster (EHT) type brake and an external manual brake release. The mechanical compression spring shall be held off by hydraulic pressure. This hydraulic pressure shall be



provided by EHT brakes. In the event of power failure, the brake shall be automatically applied & will stop the cab. The brake shall be of self adjusting type and released by means of a special handle provided in the cab.

- b. A safety device shall be provided in conjunction with the drive unit & shall have a separate flame hardened steel pinion engaging in the rack. The device shall be actuated by centrifugal weight & stops the hoist smoothly in case the normal travelling speed exceeds. The safety device shall remain locked on following this action & has to be manually reset before normal elevator operation can be resumed. For testing the safety device, the hoist shall be provided with a remote control facility. Bidder shall ensure that no person is in cab during the test.
- c. The hoist shall be provided with a centrifugal brake to prevent accidental tripping of the safety device when the cage shall be taken to the ground by gravity in case of power failure. The motor brake shall be released mechanically by a lever in the cage to allow the cage to move down. The centrifugal brake shall keep the preset speed lower than the tripping speed.

20.2.2.5

Power and Control

All electrical components furnished with the elevator shall be completely wired, energized and checked as part of the work.

All electrical control devices shall be in enclosures. Equipment furnished shall also include the following:

- a. Momentary contact push button for raise/lower control.
- b. Reversing combination motor starter with a three phase thermal overload relay for motor protection. However, the control circuit in the elevator will have miniature circuit breakers.
- c. Electric and mechanical interlocks on cab access door and landing level enclosure doors.
- d. An ultimate three phase over travel limit switch, which cuts off power and control supply in the event of over travel. The switch can also be manually turned to off position.
- e. Safety devices as described above.
- f. An alarm push button shall be provided in the cage. Alarm signal will be transferred to elevator base by means of alarm facility incorporated within the tone frequency equipment.

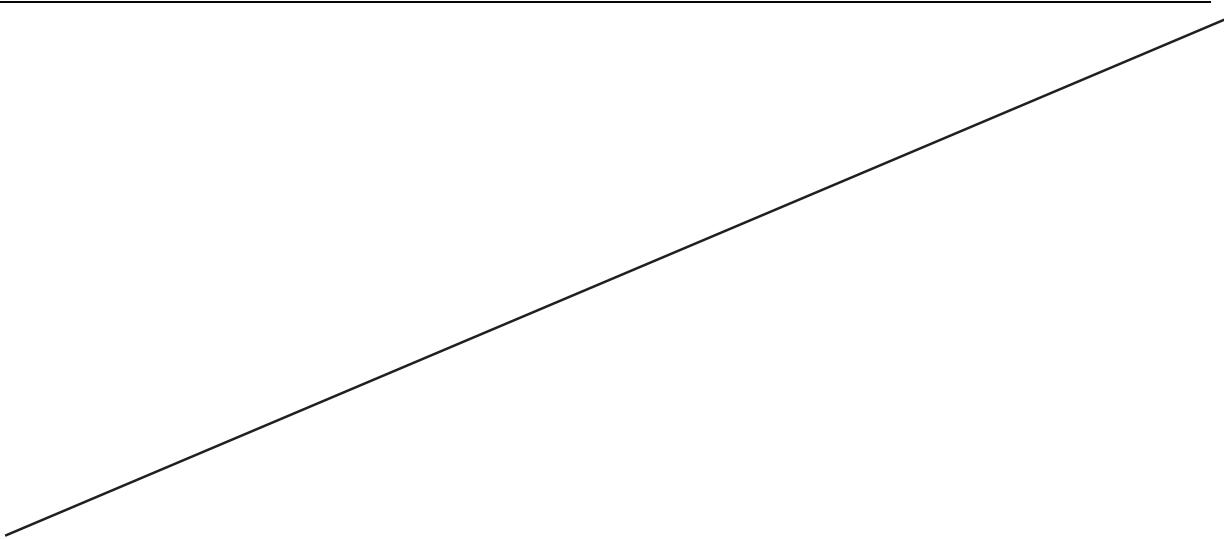
The auxiliary panel at the base will have battery and battery charger for the alarm horn. In case the bidder does not have tone frequency equipment the alarm push button shall be connected to a battery operated alarm at the elevator base.

- g. Reverse phase relay connected to prevent operation of the cab with improper phase rotation or failure in any phase in the power supply.
- h. The cable shall be supported by brackets on the cage and guide rails. A cable trolley will keep it in the tension and will be guided on the same rail as the cage. The traveling cable shall run through cable guides.



- i. One auxiliary panel shall be furnished and mounted on the ground level enclosure. Panel shall be in enclosure equipped with a main "ON-OFF" selector switch, main contactor, relays, control transformer and MCB's, tone frequency transmitter, terminal blocks, and all other accessories required for normal operation of the elevator.
- j. One main control panel shall be furnished and mounted on the top of the cab. Panel shall be in enclosure equipped with necessary equipment like rectifier, battery, battery charger, tone frequency receiver, contactors, breakers, control transformer and MCB's, thermal overload relays and all other equipment and accessories required for normal operation of the elevator.
- k. Cab shall be controlled by a semi-automatic control system with push buttons for 'UP', 'Down' and 'Stop next landing'. Cab shall be furnished with grounding type receptacle, emergency alarm push button with a normally open contact rated one ampere at 1 volts Dc, indicating light, limit switches, and all other necessary control devices required to ensure safe and continuous cab operation. One trailing cable shall connect the cab main control panel to the auxiliary panel at ground level. Cable shall supply the cab with all power requirements. Multicore cables shall be used and installed in accordance with latest applicable IS or equivalent international standards. Cable guides shall be installed every 6 metres to avoid entanglement of this cable. Control signals between the auxiliary panel at ground level, the main control panel on the cab, and the landings shall be provided with the tone frequency receiver. However, tone frequency receiver system is not available, system with trailing control cable is acceptable.
- l. Each landing assembly shall include a limit switch and push button control station installed and wired to a landing, junction box.
- m. Cab shall be equipped with a 220 volt AC interior light & duplex outlet





20.3.5 **Elevator Electrical**

20.3.5.1 **Electric Motor**

- The driving motors shall conform to IS 325 and suitable for variable voltage variable frequency (VVVF) application. All motors shall be squirrel cage induction type, suitable for operation at 415 V(+/- 10% variation), 3 phase, 3 wire 50 HZ (+3 % to -5% variation) supply. Motors shall be provided with class F Insulation.

20.3.5.2 **Controls**

The controls shall be variable voltage and variable frequency type and shall provide smooth and constant acceleration and retardation under all conditions of operation. Suitable control shall be provided in the machine room.

20.3.5.3 **Cables & Wiring**

All the cables except trailing cables shall be as per IS 1554-1 or IS 7098-1. The PVC outer sheath of these cables shall be flame retardant, low smoke (FRLS) type with the following FRLS properties.

1. Oxygen index of min 29 (as per IS:10810 Part 58).
2. Acid gas emission of max 20% (as per IEC 754-1)
3. Smoke density rating shall not be more than 60% (as per ASTMD-2843)

The circular trailing cables shall be either in accordance with IS 4289 Part-I (elastomer insulated) or IS 4289 Part II (PVC insulated). The flat type trailing cables if offered shall be in accordance with IEC 60227-6.

All wiring/ cabling between the equipments in the lift machine room and that between the machine room and equipments in the lift well and at the landings shall be wired in HDP conduits/ galvanized steel conduits to be supplied by the contractor. Alternatively armored cables may be used.

20.3.5.4 **Earthing**

The elevator structures and all equipment including metal conduits shall be effectively earthed with earth conductors provided in the machine room as per IS 3043.



12.08.11 Lift

Lift shall be provided for the chimney inside the wind shield. The lift shall be of open cage type and suitable for corrosive and dusty atmosphere that generally exists in thermal power stations/industrial complexes. It shall generally confirm to the provisions of IS:1860 and IS:4289 unless otherwise specified.

The lift shall have a minimum carrying capacity of 400 kg at a speed of 0.70 metre per second. The lift shall be of rack and pinion driven service type of approved make.



2 x 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Spec. No. CE/C/ P & E/ EE/ E/OT No.3 /2013-14

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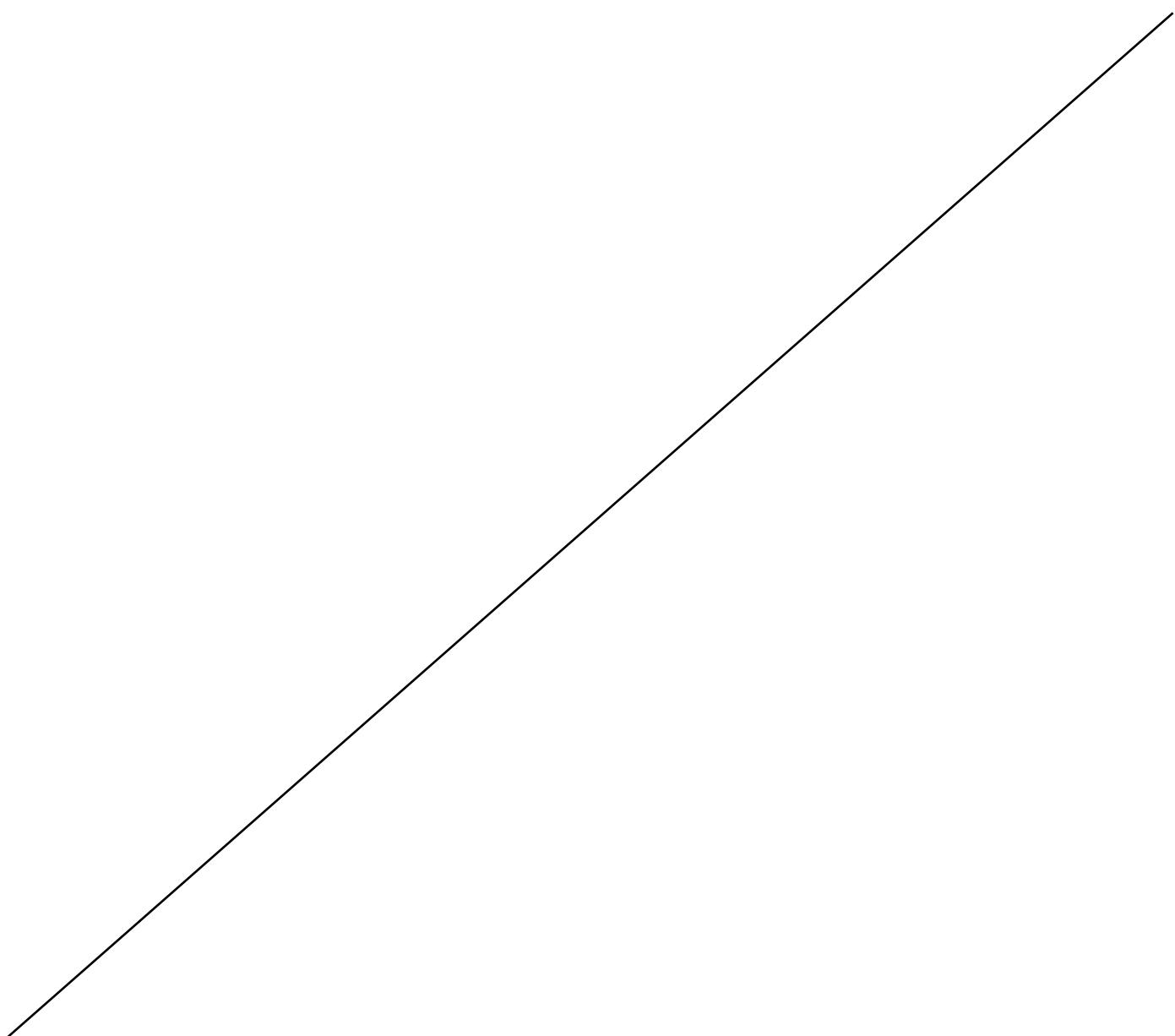


All the control devices inside the car shall be housed in a dust free and water proof enclosure. Only copper conductor FRLS insulated armoured cable of suitable size shall be included in BIDDER's scope.

Landing at all locations of platforms shall be provided unless otherwise specified in Data Sheet-A.

Construction of guard cage and supply of other accessories required for satisfactory and safe operation of lift shall be included in BIDDER's scope. BIDDER shall also supply and install safety devices such as automatic stop equipment, over speed governor etc. all complete as per Manufacturer's recommendation.

All the embedments for the lift structure, approach platforms at landing levels and the lift supporting structure including lift car shall be hot dip galvanized.



	TITLE: TECHNICAL SPECIFICATION STACK ELEVATOR	SPECIFICATION NO. PE-SS-EPC-503-A-001	
		VOLUME - IIB	
		SECTION "D"	SUB-SECTION A6
		REV. 00	DATE:
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SECTION - D
SUB-SECTION – A6

STACK ELEVATOR

	TECHNICAL SPECIFICATION STACK ELEVATOR	SPECIFICATION NO.PE-SS-EPC-503-A-001	
		VOLUME II B	
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1. DESIGN AND CONSTRUCTION

1.1 Stack Elevator - General

1.1.1 The stack elevator including mechanical and electrical components shall be installed outside/inside Single flue/ multi flue chimney. Since chimney is a free standing structure, deflection of chimney top is expected during the normal operation, so the design of the elevator shall be in such a way that the elevator operation will be safe even with the expected maximum deflection of the chimney structure. The stack elevator shall lift a pay load as indicated against rated load as mentioned in Data sheet-A or its nearest as per manufacturer's present standard in addition to the weight of the car and its accessories and shall travel at a rated speed as indicated in the data sheet-A. Travel of the elevator car, number of landings and levels shall be as per Data sheet-A attached to this section.

1.1.2 Stack elevator mechanical and electrical operating devices and trailing cable shall be designed for operation indoors/out door with dusty and high humidity conditions and shall operate equally well in any ambient temperature encountered in the site conditions. Additionally, all mechanical and electrical components of the elevator shall be designed to withstand without damage a temperature of 100°C when the elevator is not operating.

1.1.3 Cage earthing shall be done through trailing cable.

1.1.4 Stack elevator shall be attached to the chimney shell using expansion type anchor bolts drilled in to chimney shell. Elevator shall be capable of operating from the ground floor to the top platform with intermediate stops at all platforms. Landing for elevator parking shall be one (1) metre above the stack ground floor. Suitable concrete/brick steps leading to the landing for entry to cabin shall also be provided,

1.1.5 The stack elevator shall be designed in line with recommendations contained in the latest editions of the applicable codes and standards.

1.2 Equipment Specification

1.2.1 Enclosures

i. A three-sided enclosure with one access door shall be provided at graded level. At each platform landing above graded level, a one sided enclosure with access door shall be provided. Enclosures shall be fabricated from tubular steel and expanded metal or wire mesh, 2.1 m high and one coat of epoxy primer coated. Enclosure access doors shall be electrically and mechanically interlocked so that they remain closed and locked except when the Cab is at the landing. Doors shall be bi-parting and swinging type.

ii. Base of three-sided enclosure shall be securely anchored to the grade level floor slab using expansion type anchors.

1.2.2 Mast

i. Mast shall be provided in sections approximately 1.52 m in lengths considering of tubular sections and/or structural shapes welded together to form a frame work to which the rack is bolted. Mast shall be securely anchored to the concrete chimney walls.

1.2.3 Cab

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1.2.4	<p>i. Cab frame shall be fabricated from tubular steel and enclosed with expanded metal or wire mesh.</p> <p>ii. Cab floor shall be of skid resistant glass fibre reinforced plywood or approved equal. Cab shall be attached to a framed structure and form integral part with the drive mechanism located atop the cab.</p> <p>Framed structure shall include guide rollers and safety hooks to ensure positive engagement of the rack and pinion to prevent cab disengagement in case of roller failure.</p>		
1.2.5	Buffers	<p>i. Sufficient numbers of buffers of spring loaded/hydraulic type shall be fitted below the cab. The buffers shall be capable of stopping the cab without permanent damage or deformation to themselves or any other part of the equipment. The number of buffers shall be so fixed as to ensure proper sharing of impact loads by all of them.</p>	
1.2.6	Drive unit and safety Device	<p>i. Drive unit located on the top of the cab shall be complete with Ac squirrel cage induction motor, reduction gear, drive pinion and an over speed governor. Drive unit shall incorporate an electric disc brake and an external manual brake release. The brake on the electric motor will be of the electromagnetic single disc self-adjusting type with the mechanical compression spring being held off by the electromagnet.</p> <p>ii. The hoist shall be provided with a centrifugal brake to prevent accidental tripping of safety device when the cage shall be taken to the ground by gravity in case of power failure.</p>	
1.2.7	Power and Control	<p>i. All electrical components furnished with the elevator shall be completely wired, energised and checked. Necessary power distribution arrangement shall be provided by the contractor to feed the electrical power to the elevator.</p> <p>ii. All electrical control devices shall be in enclosures. Equipment furnished shall also include the following:</p> <ol style="list-style-type: none"> Momentary contact push button for raise lower control. Reversing combination motor starter with a moulded case circuit breaker for the motor. Starter shall be equipped with three thermal overload relays for motor protection. Operating handle for the combination starter circuit breaker shall be accessible from inside the cab and shall also serve as an emergency stop switch. Electrical and mechanical interlocks on cab access door and landing level enclosure doors. Over travel protection, emergency stop push button, over speed governors. All electrical and mechanical interlocks on cab access door and landing level enclosure doors, phase reversal protection shall be provided. An alarm push button shall be provided in the cage connected to a battery-operated alarm at the elevator base. Simultaneous alarm shall also sound at the plant control room in the event of any fault in the stack 	



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elevator for which one potential free contact shall be provided in each elevator for audiovisual alarm in PCR for "Stack Elevator fault" indication.

- g) Reverse phase relay connected to prevent operation of the cab with improper phase rotation or failure in any phase in the power supply.
- h) Continuous duty electric torque motor recoil cable reels as required to maintain electrical power service to all elevator electrical components throughout the limits of travel.
- i) One auxiliary panel shall be furnished and mounted on the grade level enclosure. Panel shall be equipped with a main 'ON-OFF' isolating switch, main contactor, relays, control transformer and fuses, tone frequency transfer, terminal blocks and all other accessories required for normal operation of the elevator.
- j) One main control panel shall be furnished and mounted on the top of the cab. Panel shall be equipped with necessary, equipped like rectifier, battery, charger, tone frequency receiver, contactors, MCBs, control transformer and fuses, thermal overload relays, and all other equipment and accessories required for normal operation of the elevator.
- k) Control cabinets shall be sheet steel enclosed and shall be dust, weather and vermin proof. Sheet steel used shall be cold rolled and at least 2.0 mm thick and properly braced to prevent wobbling. Degree of protection of the control cabinets shall be IP-52 as per IS:2147. Control cabinets shall be provided with hinged door(s) with padlocking arrangement. All doors, removable covers and plates shall be gasket all around with neoprene gaskets, louvers, when provided, shall have screeners and filters. The screens shall be of fine wire mesh made of brass or GI wire. Suitable cable gland plate shall be supplied fitted on to this gland plate. All cable glands shall be screwed on type and made of brass.
- l) Each motor to be controlled from the control cabinet shall be provided with 3 pole isolating switch. HRC fuses, contactors of AC4 duty class with thermal overload relays with single phasing preventer and other equipment required for satisfactory control motor. The isolating switch and contractor shall be rated at least 20% more than the connected motor full load current. Motors of 0.2 KW and above shall be rated for 415 V 3 Phase and below 0.2 KW will be 240 V single phase supply.
- m) The controllers and resistors for motors shall conform to IS-8544 (latest edition) and IS-2959 (latest edition) and shall be continuously rated for 150% full load current of the motor. Switches shall be hand operated, air breaker heavy duty, quick make, quick break type conforming to IS-4064. The rating of switch shall be so chosen as to get complete protection by associated O/L relay or fuse under all normal / abnormal conditions such as full load, overload, locked rotor, short circuit. The incoming power supply isolating switch shall be interlocked with the control cabinet door so as to prevent opening of the door when the switch is closed. Device for bypassing the door interlock shall also be provided. Switch handle shall have provision for locking in both fully open and fully closed positions.



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- n) All fuses shall be of the HRC cartridge type mounted on plug in type of fuse base having a prospective current rating of not less than 80 KA. Fuses shall be provided with visible operation indicators to show that they have operated. All accessible live connections shall be adequately shrouded and it shall be possible to change fuses with the circuit alive without danger of contact with live metal.
- o) Contractor shall provide dry type transformers with class B insulation for control power supply, lighting and space heating. Control supply will be 240 V AC. Transformer for control supply shall be provided with a control tap at 110 V, which will be earthed. Power and control supply to individual drives and users shall be distributed with separate isolating switches and primary and secondary fuses.
- p) All push buttons shall be of push to actuate type having 2 "NO" and 2 "NC" self reset contacts. They shall be provided with integral escutcheon on plate engraved with their functions. Push button contacts shall be rated for 5 Amp at 415 V AC and 1 Amp. Inductive breaking at 250 V, DC. Mushroom type emergency push button to open the main contactor shall be provided in the operator's cabin and two on the bridge platform within easy reach indicating lamps shall be of the filament type and low watt consumption lamps shall be provided with series resistors.
- q) Strip type space heaters of adequate capacity shall be provided inside in each cabinet.
- r) Control cabinets shall be supplied completely wired. All wiring shall be carried out with 650 V grade PVC insulated, stranded conductors. Power circuits shall be wired with stranded aluminum conductors of adequate sizes to suit the rated circuit shall be wired with stranded copper conductors of sizes not small than 1.5 Sq.mm. Control circuits shall be isolated from power circuits.
- s) Cab shall be controlled by a semi-automatic floor selection control system. Cab shall be furnished with 240 Volt grounding type receptacle, emergency alarm push button with a normally open contact rated 0.5 ampere at 220 VDC volts, indicating light, limit switches, and all other necessary control devices required to ensure safe and continuous cab operation. One trailing cable shall connect the cab main control panel to the auxiliary panel at ground level. Cable shall supply the cab with all power requirements. Cable guides shall be installed at every 6 metres to avoid entanglement of this cable. Control signals between the auxiliary panel at ground level and the main control panel on the cab. Will be provided with the tone frequency receiver. However control and interlocks from the landings shall be connected to the auxiliary panels located at ground level through fixed armoured cables. The power and control cables and training power cables shall be FRLS type.
- t) Each landing assembly shall include a limit switch for door interlock and push button control station installed and wired to a landing junction box.
- u) Cable trolley with cable guides for recoil of cable on to cable reel to maintain electrical power service to all elevator components through out the limits of travel.

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- v) Contractor shall furnish, install, and connect a system equipment ground to the Owner's existing chimney ground system. System equipment ground shall electrically connect panels and junction boxes, which contain electrical devices, motors, and elevator platforms and support structure. Raceway system shall not be considered as an equipment ground.
- w) All enclosures containing electrical devices shall be provided with 240 Volt, single-phase space heaters with adjustable thermostat control.
- x) All power cables and race way shall be furnished and installed by the Contractor for interconnection of the main control panel, auxiliary panel and landing junction boxes etc. Conductors included in the cable shall be as required to energise all electrical equipment furnished with the elevator. Transmission of alarm signals is done by means of tone frequency equipment. Hence communication conductors are not required.

1.2.7 Electric Motor

- i. Elevator drive motor shall be squirrel-cage induction type designed and fabricated to conform to the requirements indicated below.
- ii. Motor shall be designed for operation at the required speed: 415 Volts, 3 phase, 50 hertz. And shall be suitable for full voltage starting, S4 duty class as per IS-4722 with CDF of 25% and maximum number of 120 starts per hour in 55 Deg. C ambient temperature. Motor shall be tested at the factory to determine that it is free from electrical or mechanical defects.

1.2.8 Raceway

- i. General
 - a) Complete raceway system for the elevator shall be furnished and installed in accordance with this section and the Contractor's shop drawings as reviewed and accepted by the Engineer-in-Charge. The Contractor shall provide drawings for acceptance showing the routing of conduit and wiring for the control circuits associated with the elevator.
 - b) Raceway system is defined to include conduit and all related materials and devices required to support, secure and provide a complete system for support and protection of electrical cable and wiring.
- ii. Materials
 - a) Raceway shall be rigid galvanized steel conduit, provided in accordance with IS-1653 (latest edition).
 - b) Steel conduit, couplings, and elbows shall be hot-dip galvanized rigid mild steel. Each length of threaded conduit shall be complete with a coupling on one end and a thread protector on the other. Thread protector shall have sufficient mechanical strength to protect the threads during normal handling and storage. Flexible conduits shall be plastic jacketed, liquid tight galvanized steel.
 - c) Galvanized iron or galvanized cast steel fittings shall be used with galvanized steel conduit. Fittings installed outdoors or in damp locations

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shall be sealed and gasketed. Outdoor fittings shall be of heavy cast construction.

1.2.9 PVC Insulated FRLS Cable

i. Materials

- a) Electrical part of this specification shall be referred for FRLS cable. Unless specified otherwise, Contractor shall submit to the Engineer-in-Charge four copies of the manufacturer's test report on each cable furnished. Conductor accessories including terminal materials like glands, lugs etc. makers, tying materials and cable support shall be furnished and installed. Wire termination materials for conductors 10 Sq. mm and larger shall be pressure or bolted type. Terminals for conductors smaller than 10 Sq. mm shall be an insulated pressure connection in the shape of a ring.

ii. Installation

- a) Power and control cable shall be routed as required by the drawings. Cables pulled into the wrong conduit or cut too short shall be replaced. Cables removed from one conduit shall not be installed in another conduit.

1.2.10 Earthing

i. General

- a) Earthing system furnished and installed and include a complete earthing system for the elevator. Earthing equipment and materials shall be furnished and installed in accordance with the reference codes and standards these specification and the contractor's shop drawings as reviewed and accepted by the Engineer-in-Charge.

ii. Materials

- a) The earthing of all electrical items being supplied by the Bidder shall be in his scope. For earthing the various equipment, conductor sizes shall be as listed below:

- MCCs Motor above 90 KW : 50 x 6 Sq.mm G.I. flat
- Motors above 30 KW, upto 75 KW and lighting panel/ control panels/auxiliary panels : 25 x 6 Sq. mm G.I. flat
- Motor above 5 KW upto 30 KW : 25 x 3 mm G.I. flat
- Motors upto 5 KW and misc. : 8 SWG GI wire
- Small item like conduits,
- Junction boxes etc

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SUB-SECTION - A6

STACK ELEVATORS

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1.01.00 ELEVATOR PARTICULARS

- i) Load Carrying Capacity in Kg
- ii) Type of loading for which the stack elevator is designed
- iii) Type of stack elevator
- iv) Rated Load in Kg
- v) Speed in metre/minute
- vi) Chimney height in metre
- vii) Total travel height in metre
- viii) No. of floors to be served
- ix) Elevations of the floors to be served
- x) Method of control
- xi) Details of indicators and control
- xii) Weight of cab complete without load in Kg
- xiii) Weight of hoist cab in Kg
- xiv) Efficiency of Elevator

1.02.00 GROUND ENCLOSURE

- i) Size of the enclosure
(Length x breadth x height)
- ii) Material of construction
- iii) Size of landing entrance
- iv) Method of door operation
- v) Electrical & mechanical interlocking
Of the door provided.
- vi) Method of fixing enclosure to chimney
- vii) Any other details not covered above

1.03.00 LANDING ENCLOSURES

- viii) Size of the enclosure
(Length x breadth x height)

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- ix) Material of construction
- x) Size of landing entrance
- xi) Method of door operation
- xii) Electrical & mechanical interlocking
Of the door provided.
- xiii) Method of fixing enclosure
- xiv) Any other details not covered above

1.04.00 MAST

- i) Material of mast
- ii) Section of mast
- iii) Size of each piece of mast
- iv) Method of fixing of mast
- v) Type of mast

1.05.0 CAB

- i) Internal size
(Length x breadth x height)
- ii) Material of construction
- iii) Type of floor
- iv) Size of the cab door
- v) Method of operation of cab door
- vi) Electrical & mechanical interlocking provided
- vii) Escape hatch, electrically interlocked
- viii) Guide roller and safety hooks provided
- ix) Arrangement of light/fan inside the cab.
- x) Indicators & controls inside the cab.

1.06.0 ELEVATOR DRIVE UNIT

- i) Location of drive unit
- ii) Name of components of drive unit

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1.07.00 DETAILS OF ELECTRIC MOTOR

- i) Manufacturer
- ii) Equipment driven by motor
- iii) Type
- iv) Frame size, type & designation
- v) Maximum load considered for
 - Sizing of motor
- vi) Margin considered for sizing motor
- vii) Rated power in KW
- viii) Service factor
- ix) Speed in rpm
- x) Rated voltage in V
- xi) Current at rated voltage
 - Full load
 - Locked rotor
- xii) Insulation class
- xiii) Type of bearing and type of lubricant
- xiv) Space heater rating
- xv) Duration considered for specified
 - Ambient temperature
- xvi) Applicable standard to which motor conforms
- xvii) Degree of protection
- xviii) Efficiency at rated output
- xix) Power factor
- xx) Type of mounting

1.08.00 DETAILS OF REDUCTION GEAR

- i) Make
- ii) Material of the gears and hardness in BHN
- iii) Type of gear
- iv) Gear ratio

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- v) Gear power transmitted
 - vi) Input and output speed
- 1.09.0 DETAILS OF DRIVE AND PINION
- i) Material
 - ii) Hardness
 - iii) Fixing arrangement
- 1.10.0 DETAILS OF RACK
- i) Material
 - ii) Hardness
 - iii) Fixing arrangement
- 1.11.00 SAFETY DEVICE
- i) Make
 - ii) Type of safety device
 - iii) Speed at which the safety device
Come into action
 - iv) Method operation
 - v) Other details
 - vi) Remote control for testing
The safety device
- 1.12.00 BRAKES
- i) Manufacturer
 - ii) Types of brakes provided
 - iii) Method of operation
 - iv) Interlocking if any
 - v) Electromagnetic brake and external
Manual brake release
 - vi) Degree of protection

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1.13.00 CENTRIFUGAL BRAKE

- i) Make
- ii) Details
- iii) Remote control for testing
The safety device provided.
- iv) Any other details of drive unit
Not covered above.

1.14.00 BUFFERS

- i) No. and location of the buffers provided
- ii) Type of buffers
- iii) If the buffers are spring type

Furnish the following:

- Diameter of the spring in mm
- Max. Compression under extreme cond.
- No. of spring coil
- Sectional dimension
- Material of spring
- Compression /unit load

1.15.00 POWER CABLES

Fixed

Trailing

- i) Manufacturer
- ii) Type and material
- iii) Rated voltage
- iv) Rated current
- v) Type of insulation
- vi) No. of strands
- vii) No. of cores
- viii) Short circuit current rating
- ix) Resistance per 1000 metres

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- x) Applicable standards

1.16.00 CONTROL CABLES

- xi) Manufacturer
- xii) Type and material
- xiii) Rated voltage
- xiv) Rated current
- xv) Type of insulation
- xvi) No. of strands
- xvii) No. of cores
- xviii) Short circuit current rating
- xix) Resistance per 1000 metres
- xx) Applicable standards

1.17.00 CONDUITS/ACCESSORIES AND FITTINGS

- i) Material
- ii) Manufacturer
- iii) Applicable standard

1.18.00 CONTACTORS

- i) Make
- ii) Type
- iii) Applicable standards
- iv) No. of poles
- v) Rated voltage
- vi) Rated frequency
- vii) Rated current
- viii) Closing coil
 - Rated voltage
 - Current consumption

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- Power consumption in KW
 - Insulation class for electromagnet
- ix) Rated duty
- Rated insulation category
 - No. of operations per hour
 - Rated breaking capacity
 - Rated making capacity
 - Short time rating in sec
- ix) Limits of operation
- Supply voltage variations (%)
 - Supply frequency variations (%)
 - Drop out voltage (%)
 - Min. pick up voltage (%)
- x) Thermal overload relay setting range available
- xi) Auxiliary contacts
- Numbers
 - Current rating (Make and break)
- xii) Rated utilization category as per IS 2459
- xiii) Max. recommended back up HRC fuse size

1.19.00 FUSES

- i) Make
- ii) Type
- iii) Continuous current
- iv) Rated voltage
- v) Rated frequency
- vi) Rupturing capacity
- vii) Mounting details
- viii) Fixing and removing arrangement
- ix) Visual indication for fuses
- x) Applicable standards

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1.20.00 INDICATING LAMPS

- i) Make
- ii) Type
- iii) Rated voltage
- iv) Rated power consumption in Watt
- v) Permissible voltage variation
- vi) Series resistance provided

1.21.00 PUSH BUTTONS

- i) Make
- ii) Type
- iii) Rating
 - Voltage
 - Continuous current
- iv) No. of aux. Contacts
 - Normally open
 - Normally closed
- v) Contact rating
- vi) Colours
- vii) Mounting arrangement

1.22.00 OVER TRAVEL LIMIT SWITCH

- i) Make
- ii) Type
- iii) Material of contacts
- iv) Contact rating
- v) Numbers furnished

1.23.00 CONTROL TRANSFORMER

- i) Make
- ii) Type
- iii) Output rating (VA)
- iv) Ratio

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- v) Class of insulation
- vi) Max. temp rise of winding over
Specified ambient temperature.
- vii) One minute power frequency test voltage
- viii) Applicable standards

1.24.00 CIRCUIT BREAKER AND ISOLATOR

- i) Make
- ii) Type
- iii) Current rating in amps
- iv) Interruption duty
- v) Max. breaking capacity
- vi) Operating voltage of tripping and closing coils
- vii) Max. permissible variation of operating voltage

1.25.00 RACEWAY

- i) Raceway as per specification
- ii) Material of
 - Indoor fittings
 - Outdoor fittings
 - Raceway support
 - Junction boxes

1.26.0 EARTHING

- i) Earthing conductor
 - Size
 - Material
- ii) Material of earthing cable
- iii) Clamps. Bolts, washers, nuts and another
Hardware of iron steel are galvanized.

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1.27.00 MOTOR STARTER

- i) Make & Size
- ii) Rating]
- iii) Mechanically latched type
- iv) Single phase prevention feature provided
- v) Degree of protection

1.28.00 DETAILS OF CONTROL PANELS

- i) No. of panels
- ii) Type of enclosures (Degree of protection)
- iii) Thickness of sheet metal
- iv) Painting
 - Colour
 - Finish
- v) Cable entry
- vi) Manufacturer

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Annexure B to Corrigendum 8 dated September 07, 2021 to
Tender Specification BHEL PSSR SCT 1979

Price Bid-Revision 01, Volume II of Tender BHEL PSSR SCT 1979

TENDER SPECIFICATION BHEL PSSR SCT 1979

for

Part A: Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney and

Part B: Providing, installing and handing over of two covered coal sheds covering three coal stock piles using tubular steel sections conforming to IS 1161 / IS 4923 and Steel structural sections conforming to IS 2062-2006, Roof monitor if required shall be provided on full length as per the requirement. Scope is inclusive of Design, supply, fabrication, welding, handling, assembling & erection in position of tubular space frame structure or Steel framed structure, cladding sheets (roof and side sheeting) and handing over to customer (as per specification)

At 2 X 660 MW Ennore SEZ TPP (Unit 1 and 2)

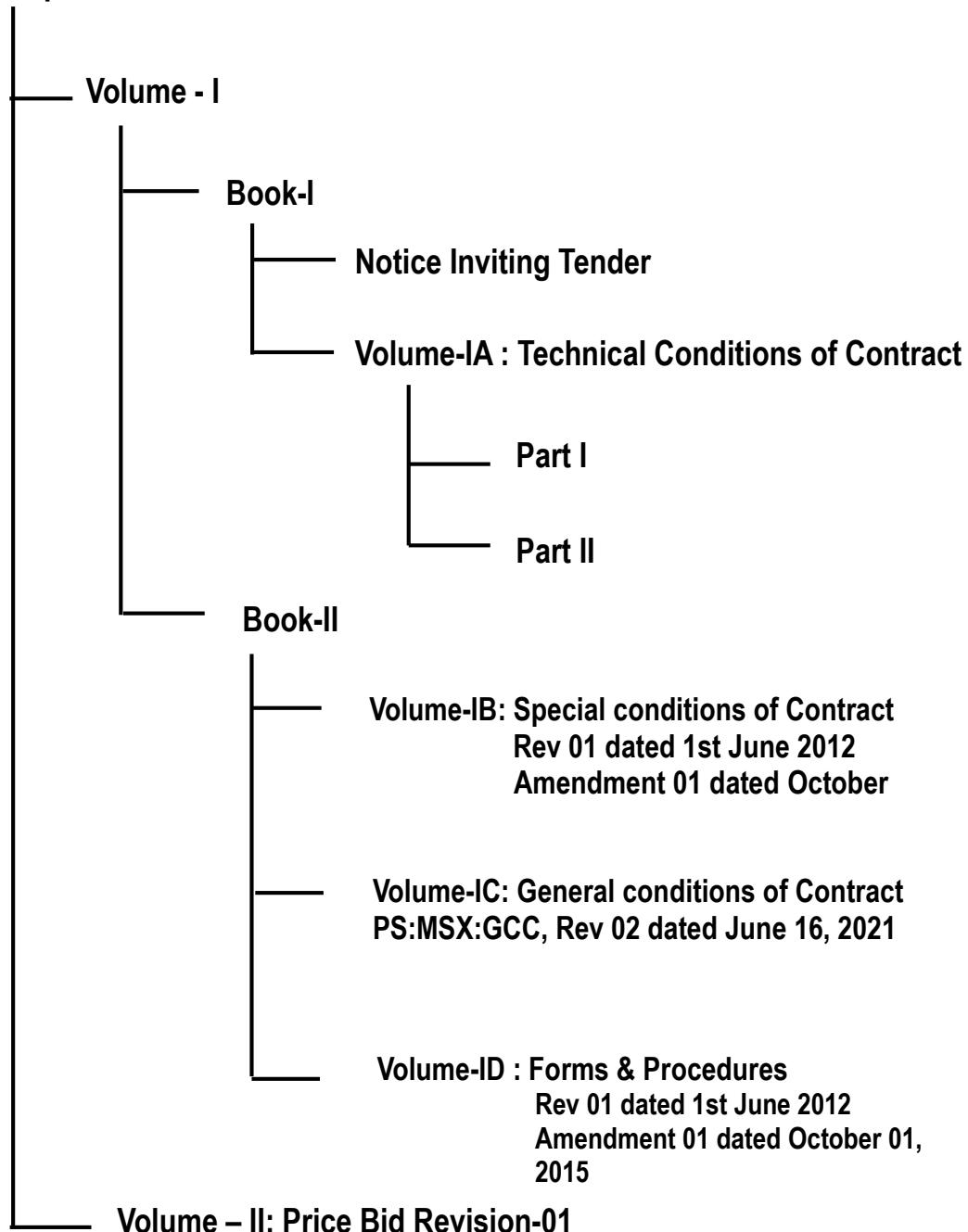
VOLUME –II PRICE BID REVISION-01



BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector – Southern Region
Tek Towers, No.11, Old Mahabalipuram Road,
Okkiyam Thoraipakkam, Chennai - 600097

TENDER SPECIFICATION CONSISTS OF

Tender Specification



PRICE BID-REVISION 01

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Description	No. of pages
Part A of Price Bid: Instructions to the Bidders	02
Part B of Price Bid : Format for quoting “Total Amount” for “Scope of Works-Part A”. (Enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender)	(Separate Excel File)
Part C of Price Bid Revision -01 consisting of a) Bill of Quantities pertaining to “Scope of Works-Part A” titled “Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1”, with weightage for amount of each items with respect to the total quoted price b) Bill of Quantities pertaining to “Scope of Works-Part B” titled “Tender Specification BHEL:PSSR:SCT:1979_PART_B Rev 1”	107 01

PART A

Instruction to Bidders:

1. The BOQ in Part C of Price Bid-Revision 01 consists of two parts:
 - I. Bill of Quantities pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1"
 - II. Bill of Quantities pertaining to "Scope of Works-Part B" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_B Rev 1"
2. Bidder shall furnish his quote for "Scope of Works-Part A".
3. The amount for "Scope of Works-Part B" shall be derived from value quoted for "Scope of Works-Part A".

The ratio of the amount for works under Part A and Part B scope of works shall be 1 : 0.1176471.

(Explanatory statement: If the final accepted amount for works under Part A scope of works is considered as 1, then the amount for works under Part B scope of works shall be considered as 0.1176471).

4. Bidders shall quote "Total Amount" for "Scope of Works-Part A" in the format enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender and upload the same under 'Packet details - > Tender covers -> Finance '(Cover Type Description – Price Bid)". The same shall be complete in all respect for the full "Scope of Works-Part A" defined in specification and in accordance with terms & conditions of the tender. Any other entry elsewhere in the price bid shall be treated as Null and Void. Quoting of rates in any other form/formats will not be entertained.

The above mentioned "Total Amount" is for the entire Bill of Quantity (BOQ) pertaining to "Scope of Works-Part A" titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1" in Part-C of this Price Bid.

5. For "Scope of Works-Part A"

- i. In the Bill of Quantity titled "Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1", BHEL has pre-fixed the weightages for the amount of individual items of Bill of Quantity with respect to the 'Total Amount' in Part C of Price Bid.
- ii. Based on the pre-fixed weightages, the amount for the individual items of the Bill of Quantity shall be arrived at. This amount shall be rounded off to the nearest rupee.

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- iii. Based on the quantities of individual item and the amount arrived in Sl. No. (ii) above, unit rate of individual items shall be derived. This unit rate shall be rounded off to four decimal places.
- iv. Bidders to note that this Bill of quantities For “Scope of Works-Part A” is approximate only and is liable for variation. Payment shall be made on item rate basis for the actual quantities of work executed at the unit rate arrived at as per Sl No. (iii) above.

6. **For “Scope of Works-Part B”**

- i. The value for works for “Scope of Works-Part B” as derived at Sl No.3 above is for the entire Bill of quantities for “Scope of Works-Part B”
 - ii. Payment shall be made as per the Terms of Payment specified in Chapter VII of Part I of Volume IA, Technical Conditions of Contract.
7. Bidders are also requested to refer Clause 36.0 of NIT for “Mode of Award”.

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
3000.0	Ground Improvement	--		
3001.0	Mobilisation of ground improvement rigs and accessories capable of installing driven cast-in-situ compaction piles (applicable for ST No.3002) in all types of strata/ash etc. to the project site and demobilisation of the same after completion of works etc all complete.	Each	1	.0000851
3002.0	Providing and installing 550 mm diameter and 14 m deep driven cast-in-situ compaction pile by driving a suitable MS casing pipe (removable) with detachable M.S.shoe (flat/conical) at the bottom and filling inside the casing pipe in layers of 800mm using 1 sand: 2 stone aggregates and each layer be well compacted by dynamic compaction method including all materials, equipments etc all complete as per specification, drawing and as directed by the engineer-in-charge. Prior to compaction of fill at each layer, lift the casing for about 800mm from bottom and then the backfill shall be thoroughly compacted. This procedure shall be repeated for every layer till the ground level is reached for ground improvement of pond ash/soil deposit at desired location.	Each	1,947	.0252176
3003.0	Mobilisation of ground improvement rigs and accessories capable of installing stone columns by vibro-displacement method (dry method) using vibro float/vibro cat/any other suitable means (applicable for ST No.3004) in all types of strata/ash etc to the project site and demobilisation of the same after completion of works etc all complete.	Each	2	.0004135
3004.0	Providing and installing 550 mm diameter and 14 m deep stone column by vibro-displacement method (dry method) using vibro float/vibro cat/any other suitable means and filling in layers of 800 mm using 1 sand : 2 stone aggregates and each layer be well compacted by vibro compaction method including all materials, equipments etc complete as per specification, drawing and as directed by the engineer-in-charge. This procedure shall be repeated for each layer of fill till the ground level is reached for ground improvement of pond ash/soil deposit at desired location.	Each	6,343	.0598253

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
3005.0	Rebate on ST No 3002 for not providing 1 sand : 2 stone aggregates to a depth of 2m below ground level.	Cum	925	-.0017191
3006.0	Rebate on ST No 3004 for not providing 1 sand : 2 stone aggregates to a depth of 2m below ground level.	Cum	3,012	-.0036364
3007.0	Extra over ST. No. 3002 for driven cast-in-situ compaction pile of length beyond the specified depth of 14m.	RM	10	.0000089
3008.0	Extra over ST. No. 3004 for stone column with vibro-displacement method (dry method) of length beyond the specified depth of 14m.	RM	10	.0000076
3009.0	Rebate on ST.No.3002 for driven cast-in-situ compaction pile of length less than the specified depth of 14m.	RM	10	-.0000089
3010.0	Rebate on ST No.3004 for stone column with vibro-displacement method (dry method) of length less than the specified depth of 14m.	RM	10	-.0000076
3011.0	Dismantling of conventional ground improvement rigs and accessories capable of installing driven cast-in-situ compaction piles that is already deployed at site by M/s Simplex and stacking at a place as directed by BHEL Engineer In - Charge	Each	1	.0000425
--	100 EARTH WORK	--		
--	Earth work In excavation, backfilling and disposal including necessary men/women, materials, equipment, loading, transportation, unloading, dewatering etc as per specification, drawing and as directed by engineer- in-charge for the following.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
101.0	Earth work in excavation in all types of soil/ash which can be excavated by any means including setting out, levelling, dewatering (but excluding special type of dewatering viz. well point method), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 500 m, spreading/levelling of disposed materials etc all complete for following depths below ground level.	--		
a	Depth from ground level but not exceeding 2 m	CUM	15,159	.0005892
b	Depth exceeding 2 m but not exceeding 4 m	CUM	5,000	.0002251
c	Depth exceeding 4 m but not exceeding 6 m	CUM	3,000	.0001735
d	Depth exceeding 6 m but not exceeding 8 m	CUM	1,500	.0001202
e	Depth exceeding 8 m but not exceeding 10 m	CUM	569	.0000653
f	Depth exceeding 10 m but not exceeding 15 m	CUM	100	.0000163
AA10 1	Removal of sludge for excavated pit for carrying out various works viz. PCC, reinforcement placement, shuttering, staging, RCC, etc. as per direction of engineer in charge Note: This item shall be applicable for areas wherein excavation has been executed by M/s SIMPLEX and subsequent activities need removal sludge in opinion of engineer in charge For measurement purpose volume of sludge removed shall be considered. Level shall be taken prior to start of work and after completion of sludge removal for calculation of volume of sludge. All lifts are included in this item and lead upto 100m is included in this item. Further disposal of sludge shall be paid under item no. 109.	CUM	10	.0000014

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A101	Filling geo bags with available earth (within 500m), sewing/ stitching the bags and stacking all complete including providing labour, tools & plant, etc. as per the direction of BHEL engineer in-charge Geo bags shall be supplied by BHEL.	MT	1	.0000001
AAA1 01	Supply of geo bags of size 0.7m x 1m	Each	100	.0000029
B101	Taking from stack and placing in position filled-in geo bags inside excavated area of all depths for side protection including providing all required machineries, tools and plants, labour, consumable, fuels, etc. all complete as per direction of Engineer In-charge	MT	1	.0000007
102.0	Extra over ST No. 101 for dewatering of ground water by well point method as per IS 9759.	CUM	3,000	.0004763
107.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with selected materials from compulsorily excavated soil/ash available within a lead upto 500m and compacted as specified including re-excavation of stacked earth, watering, ramming/compaction by manual/mechanical means, dressing etc all complete.for the following.	--		
a	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII)	CUM	6,000	.0003299
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	3,500	.0001825
108.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with soil/ash directly from excavation and compacted as specified including watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII)	CUM	1,486.228	.0000648
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	8,127	.0003313
109.0	Extra over ST No. 101, AA101, B101, 107 & 108 for carriage of excavated earth/selected materials for every 1 km or part thereof beyond an initial lead of 500m.	CUM	11,000	.0000834
110.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with approved borrowed soil (borrowed soil to be arranged by the bidder) and compacted as specified including supplying borrowed soil, royalty (if any), watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following.	--		
a	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII)	CUM	35,788	.0151813
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM	10,098.975	.0042553
111.0	Supplying and filling sand upto any depth under floors, around foundations, plinths etc. in layers not exceeding 250 mm thickness and compacted so as to achieve at least 80% relative density as per IS-2720 (Part-XIV) including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any) etc. all complete.	CUM	1,500	.0017181
A112	Earthwork in excavation using Horizontal directional drilling (HDD) technique including equipments, machinery etc. all complete.	CUM	100	.0005662

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A113	Providing and laying rubble soling with specified sizes of approved quality hard rock rubble or hand broken hard metal of sizes ranging from 100mm to 230mm, at all position and depths below or above finished ground floor level, below foundations, below flooring, and for providing hard standing etc in one or more layers each of approximately 230mm thickness, hand packing, filling in interstices with quarry spalls, grits and providing a layer of 50mm. thickness (consolidated) of moorum/equivalent locally available approved material over each layer of soling including watering, thoroughly compacting each layer with 10 tonne power roller with minimum 6 passes (or with vibrating plate of approved capacity at places not approachable by power roller) all as per the direction of the Engineer and as per specification.	CUM	2,300	.0017151
114.0	Shoring & strutting of already excavated area (Measurements to be taken of the face area timbered)	--	--	--
a	Depth not exceeding 1.5 m	SQM	10	.0000006
b	Depth exceeding 1.5 m but not exceeding 3 m	SQM	10	.0000007
c	Depth exceeding 3 m but not exceeding 4.5 m	SQM	10	.0000008
--	200 CONCRETE WORKS	--	--	--
--	Providing and placing concrete work including cost of labour, materials and equipment for handling, transportation, batching, mixing, placing, vibrating and curing, (excluding cost of centering, shuttering and reinforcement) with mechanised equipments like batching plant, transit mixer, concrete pump etc. complete as per drawing, specifications and as per direction of engineer in charge for the following.	--	--	--
201.0	Concrete of grade M7.5 (1 part cement, 4 part fine aggregate, 8 parts of 40 mm graded aggregate by volume) as filling course at any depth below finished floor level, under and around foundations/floors, mass fill etc.	CUM	100	.0002577

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A201	Concrete of grade M15 (1 part cement, 2 part fine aggregate, 4 parts of 40 mm graded aggregate by volume) as filling course at any depth below finished floor level, under and around foundations/floors, mass fill etc.	CUM	200	.0006044
202.0	Concrete of grade M10 (1 part cement, 3 part fine aggregate, 6 parts of 40 mm graded aggregate by volume) as lean concrete, levelling course, mud mat under and around foundations/floors at any depth below finished floor level etc.	CUM	2,300	.0062689
203.0	Concrete of grade M15 (1 part cement, 2 part fine aggregate, 4 parts of 40 mm graded aggregate by volume) as lean concrete, levelling course, mud mat under and around foundations/floors at any depth below finished floor level etc.	CUM	200	.0006044
204.0	Concrete under floors, paving, plinth protection, pipe encasing etc complete with 20 mm nominal size graded aggregate at any depth below finished floor level for the following grades.	--		
a	M15 Grade	CUM	3,000	.0091055
b	M20 Grade	CUM	2,017.08	.006184
A205	Providing and laying Design Mix cement concrete conforming to IS:456 & IS 10262-2009 for reinforced concrete works with fine aggregate and graded hard stone aggregate of 20mm nominal size in foundations/substructure, grade slab, paving, drains, under floors etc at any level below finished floor level, any shape, position or thickness etc complete including use of plasticizer/ superplasticizer conforming to IS:9103 (latest) to achieve required slump in concrete all complete as per specification & drawing for the following.	--		
a	M25 Grade	CUM	4,940	.0160652
b	M30 Grade	CUM	5,100	.0170038
c	M35 Grade	CUM	1,500	.0051241

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
206.0	Providing and laying Design Mix cement concrete conforming to IS:456 & IS 10262-2009 for reinforced concrete works with fine aggregate and graded hard stone aggregate of 20mm nominal size in superstructure at any level above finished floor level, any shape, position or thickness etc complete including use of plasticizer/superplasticizer conforming to IS:9103 (latest) to achieve required slump in concrete all complete as per specification & drawing for the following.	--		
a	M25 Grade	CUM	1,294	.0041986
b	M30 Grade	CUM	11,798	.0392479
207.0	Providing and laying Design Mix cement concrete confirming to IS:456 & IS 10262-2009 for reinforced concrete works of grade M-30 Grade in machine foundations for TG, Gas Turbine, ID/FD/PA fans, BFP, Coal mills at all elevations below/above finished floor level except TG deck and top decks supported over vibration isolation system including addition of suitable plasticizer conforming to IS 9103(latest) to achieve a slump more than 125mm in concrete as per manufacturer's recommendation with 20 mm nominal size graded aggregate in concrete all complete as per specification & drawing.	CUM	5,407	.0185863
A207	Providing and laying Design Mix cement concrete confirming to IS:456 & IS 10262-2009 for reinforced concrete works of grade M-35 Grade in machine foundations for TG, Gas Turbine, ID/FD/PA fans, BFP, Coal mills at all elevations below/above finished floor level except TG deck and top decks supported over vibration isolation system including addition of suitable plasticizer conforming to IS 9103(latest) to achieve a slump more than 125mm in concrete as per manufacturer's recommendation with 20 mm nominal size graded aggregate in concrete all complete as per specification & drawing.	CUM	2,718	.0095658

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
208.0	<p>Providing and laying Design Mix cement concrete as per IS:456 & IS 10262-2009 of grades mentioned below for reinforced concrete works using graded aggregate in top decks of all machine foundations supported on vibration isolation system (excluding supply and installation of vibration system) at all levels including addition of suitable plasticizers conforming to IS9103 to achieve a slump more than 125 mm in concrete as per manufacturers recommendation, preparation of scheme for concreting, getting it approved by engineer, labour, materials, equipment, handling, batching, transporting, mixing, pumping, placing, leveling, vibrating, compacting, curing, testing, cleaning and rendering the exposed surface with cement sand mortar to give a smooth and even surface, maintaining and submitting records of concreting, petrographic examination and potential reactivity of aggregate etc. all complete as per specification, drawing and instructions of engineer, including UPV testing as directed by engineer in charge, rectification of the defects in concreting observed by ultra-sonic pulse velocity (UPV) testing by cement/epoxy grout etc, but excluding formwork, staging, reinforcement, embedments and temperature control of concrete.</p> <p>Payment terms - a) After casting 75% ; b) After receipt of ultrasonic test report - 25%.</p>	--		
a	M30 grade (with 20mm nominal size graded stone aggregate)	CUM	2,087	.0086331
b	M35 grade (with 20mm nominal size graded stone aggregate)	CUM	248	.0010528

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A208	Providing and laying Design Mix cement concrete as per IS:456 & IS 10262-2009 of grades mentioned below for reinforced concrete works using graded aggregate in top decks of all machine foundations and top deck of TG foundation at all levels including addition of suitable plasticizers conforming to IS9103 to achieve a slump more than 125 mm in concrete as per manufacturers recommendation, preparation of scheme for concreting, getting it approved by engineer, labour, materials, equipment, handling, batching, transporting, mixing, pumping, placing, leveling, vibrating, compacting, curing, testing, cleaning and rendering the exposed surface with cement sand mortar to give a smooth and even surface, maintaining and submitting records of concreting, petrographic examination and potential reactivity of aggregate etc. all complete as per specification, drawing and instructions of engineer, including UPV testing as directed by engineer in charge, rectification of the defects in concreting observed by ultra-sonic pulse velocity (UPV) testing by cement/epoxy grout etc, but excluding formwork, staging, reinforcement, embedments and temperature control of concrete. Payment terms - a) After casting 75% ; b) After receipt of ultrasonic test report - 25%.	--		
a	M30 grade (with 20mm nominal size graded stone aggregate)	CUM	362	.0014975
b	M35 grade (with 20mm nominal size graded stone aggregate)	CUM	2,688.5	.0114133
A209	Extra over St. No. A205 to 208, A208 for controlling of temperature of fresh concrete to less than 25 degree centigrade using ice, including all related arrangements for providing, storing and mixing of ice with water, cooling of aggregates etc. All complete as per specification, drawing and instruction of engineer in charge.	CUM	2,350	.0011083
210.0	Extra over ST Nos. A205 to A207 for conducting UPV test for concrete at all levels including all equipments, making necessary arrangements, staging, submission of report etc. all complete as directed by engineer in charge and as per specification.	CUM	8,392.61	.0006325
A210	Conducting UPV test for already casted concrete decks/foundations at all levels including all equipments, making necessary arrangements, staging, submission of report etc. all complete as directed by engineer in charge and as per specification.	CUM	50	.0000038

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A211	Providing and encasing of structural steel member with concrete using nominal aggregate size of 12.5mm down. Encased member shall be wrapped with chicken wire mesh with proper lap etc. complete as per specification for the following grades.	--		
a	M20 Grade	CUM	869	.002737
b	M25 Grade	CUM	415	.001334
c	M30 grade	CUM	1,176.47	.0038575
212.0	Screeed concrete conforming to IS 456 with fine aggregate and graded hard stone aggregate 12.5mm/6 mm nominal size on the roof at any level or thickness, drains etc complete as per following.	--		
a	1:2:4 (1 part cement, 2 part fine aggregate, 4 parts of aggregate by volume)	CUM	50	.0001511
b	1:1.5:3 (1 part cement, 1.5 part fine aggregate, 3 parts of aggregate by volume)	CUM	50	.0001543
A212	Screeed concrete conforming to IS 456 with fine aggregate and graded hard stone aggregate 12.5mm/6 mm nominal size on the roof at any level or thickness, drains etc complete as per following.	--		
a	M 20 grade	CUM	100	.0003087

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A213	Providing and laying Design Mix cement concrete as per IS:456 & IS 10262-2009 for reinforced concrete works using graded aggregate for Concrete in precast works like roof slabs/trench covers, fins, lintels, chajas, beams, columns, wall panels, facias etc. at all levels in all kinds of work including formwork/moulds, curing, making of grooves/notches, rendering the top exposed surface with cement sand mortar (1:3), handling, storing, transporting, all leads, erection without damage, setting in position / pockets with mix 1:1:2 (1 cement : 1 coarse sand : 2 aggregate of 6 mm down graded stonechips) using non shrink admixture, filling the gaps between adjacent precast units with M30 grade concrete or cement sand mortar (1:3) and including making of holes for bolts for fixing, welding etc. complete with graded aggregate (20/12.5/10 mm) and as per specification and drawing for following grades. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor). Payment shall be made for the measurement of the volume of the precast works.	--		
a	M 25 grade	CUM	1,542	.0069947
b	M 30 grade	CUM	500	.0022973
A213c	Rendering the top exposed surface with cement sand mortar (1:3), handling, storing, transpoting, all leads, erection precast column & panel without damage, setting in position / pockets with mix 1:1:2 (1 cement : 1 coarse sand : 2 aggregate of 6 mm down graded stonechips) using non shrink admixture, filling the gaps between adjacent precast units with M30 grade concrete or cement sand mortar (1:3) and including making of holes for bolts for fixing, welding etc. complete with graded aggregate (20/12.5/10 mm) and as per specification and drawing for following grades. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor). Payment shall be made for the measurement of the volume of the precast works.	CUM	1	.0000011

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A214	Providing and laying Design Mix cement concrete as per IS:456, IS 3370 & IS 10262-2009 for reinforced concrete works graded aggregate for Concrete in water retaining/conveying structures including addition of suitable plastisizer cum waterproofing cement additives confirming to IS 9103 latest to achieve a slump more than 125 mm in concrete as per manufacturers recommendation and conforming to limits of permeability as per IS 2545 and specification with 20 mm nominal size graded aggregate for following grades.	--		
b	M 30 grade	CUM	3,683	.0140256
c	M 35 grade	CUM	18,130.789	.0704263
215.0	Dismantling concrete work for all types of structures at all levels including stacking of servicable material to a lead of 500 m and disposal of unservicable material upto a lead of 2 km, cutting of reinforcement, labour, equipment, safety precautions etc all complete as per drawings, specification and instructions of engineer in charge.	--		
a	Plain cement concrete of all grades	CUM	159	.0002522
b	Reinforced cement concrete of all grades	CUM	663	.0014722
216.0	Chipping of concrete in reinforced concrete work, cutting pockets, making openings at all levels and according to shapes, disposal of waste materials upto a lead of 2 km as directed by engineer including equipment, safety precautions, making good the broken surface etc all complete as per specification, drawing, instructions of engineer in charge but excluding cutting of reinforcement .	CUDM	2,200	.0055828
217.0	Extra over and above St No 216 for cutting of reinforcement, all sizes and types including labour, equipment, return of cut reinforcement to store etc all complete as per specification, drawings and instructions of engineer in charge. Measurement shall be on the cross sectional area of reinforcement cut.	SQCM	10	.0000317

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
218.0	Cutting Reinforced concrete with mechanised tools like Core drilling machine etc. for cutting pockets, holes, cores in slab, beam, column or foundation as per direction of engineer in charge.	CUDM	10	.0000095
219.0	Providing and applying curing compound of approved make where ever required as per manufacturer's specification.	SQM	100	.0000027
220.0	Providing & laying Plum cement concrete 1:3:6 with 75% graded metal of maximum size 40 mm and 25%plums of maximum size 150 mm.	CUM	4,152	.0114127
--	300 FORM WORKS	--		
--	Providing, fixing and removing formwork at any elevations for all structures, as per specifications and including all labour, material, scaffoldings and centering complete including pockets etc. complete as per drawing, specifications and as per direction of engineer in charge for the following.	--		
301.0	Fairface form work with good quality water proof ply wood of required thickness and smooth surface below finished ground floor level for foundations, footings, base of columns, walls, columns, pilasters, beams, mass concrete, trenches etc.	SQM	11,126	.0023682
302.0	Fairface form work with good quality water proof ply wood of required thickness and smooth surface above finished ground floor level for columns, beams, suspended floors, roofs, lintels, cantilevers, staircases, landings, balconies, domes, arches, circular overhead tanks etc. for all heights.	SQM	39,537.043	.0102519
303.0	Fairface Formwork with good quality water proof ply wood of required thickness and smooth surface for TG superstructure (above base raft level) including preparation of scheme, designing, submission and approval of staging drawing with sufficient props, braces and ties at every tier of height of approx. 4m for all heights.	SQM	1,478.6	.0006084
304.0	Providing, fixing and removing formwork in block-outs/pockets and openings (below 0.1 sqm plan area) at all elevations including cutting, formation of all shapes and all other operations required for making the required shape and size all complete as per specification, drawing and instruction of engineer in charge.	--		

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	Upto 150 mm depth	Each	100	.0000071
b	Pockets of depths more than 150mm and upto 300 mm depth	Each	100	.0000142
c	Pockets of depths more than 300mm and upto 600 mm depth	Each	100	.0000283
d	Pockets of depths more than 600mm and upto 1000 mm depth	Each	100	.0000472
e	Pockets of depths more than 1000mm and upto 1500 mm depth	Each	71	.0000502
A307	Removal of formwork & staging alongwith required associated work as per direction of engineer in charge Note: This item shall be applicable for areas wherein formwork has been erected/ placed by M/s SIMPLEX, but not removed after execution of subsequent activities	SqM	50	.0000029
--	400 REINFORCEMENT	--		
401.0	Providing, straightening, cutting, bending, placing in position at any level, binding of mild steel reinforcements conforming to grade 1 of IS:432 part 1 in concrete including cost of reinforcement and binding wire, labour, scaffolding, transportation to & from stores etc. all complete as per specifications & drawings.	MT	161	.0044938
402.0	Providing, straightening, cutting, bending, placing in position at any level, binding in position of steel reinforcements of TMT steel of grade Fe-500 confirming to IS:1786 including cost of binding wire, labour, scaffolding, transportation to & from stores etc complete all as per specifications, drawings and as directed by Engineer.	MT	50	.001456
402A	Transportation from BHEL store, straightening, cutting, bending, placing in position at any level, binding in position of steel reinforcements of TMT steel of grade Fe-500 confirming to IS:1786 including cost of binding wire, labour, scaffolding, transportation to & from stores etc complete all as per specifications, drawings and as directed by Engineer. (Reinforcement steel except mild steel shall be supplied by BHEL free of cost for incorporation in permanent works)	MT	4,500	.0265642

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
404.0	Extra over ST No. 401, 402, 402A for providing fusion bonded epoxy coating by mechanised & qualified process including blast cleaning to white metal as per Swedish code, heating in induction heater, electrostatically spraying the epoxy powder, complete fusion to give minimum coating thickness of 200-300 microns, gradual cooling without affecting the properties of steel, testing as per ASTM 775 and IS:13620, flexibility & holiday test, proper packing, safe transportation, touchup at site, etc. complete to ensure proper resistance of FBE against corrosive environment including transport of the steel from BHEL site store to vendor plant and bringing back to site and special handling during straightening, cutting, bending, placing and providing PVC coating on binding wire.	MT	4,500	.0262663
A404	Extra over ST No. 402 for providing High Strength Deformed Bars confirming to IS 1786 Fe 500/500 D; Corrision resistant Grade (HCRM) suitable for marine construction with micro alloying combination Cr+Cu>0.4% instead of TMT steel of grade 500 confirming to IS 1786. Bidder to quote for differential cost only.	MT	1	.0000013
406.0	Providing, straightening cutting, bending, placing in position at any level, binding of mild steel reinforcements in brickwork including cost of reinforcement and binding wire, labour, scaffolding etc. complete all as per specifications & drawings.	MT	25	.0007018
407.0	Providing, straightening, cutting, bending, placing in position at any level, binding in position high yield strength steel reinforcements in brickwork including cost of reinforcement and binding wire, labour, scaffolding etc. complete all as per specifications & drawings.	MT	9.5	.0002781
--	500 WATER PROOFING WORKS	--		
--	Water proofing works including all labour, material, equipment, transportation, handling, curing, sampling, testing etc at any level as per specification, drawings and as directed by engineer - in - charge.	--		
501.0	Providing and laying underbed grading plaster with cement mortar 1:4 (1 cement : 4 sand) and average thickness of 15 mm including preparation of surface, batching, mixing, leveling etc. all complete.	SQM	2,331.58	.0001791

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
502.0	Providing and laying in-situ light weight foam concrete insulation as per relevant IS Code in suitable panels over roofs followed by a layer of 15 mm thick cement sand plaster 1:4 (1 cement: 4 coarse sand) after the curing period of laid foam concrete and providing of expansion joint at intervals as per the recommendation of manufacturer. The insulating properties shall be such that the thermal conductivity shall not exceed 0.125 Kcal/sqm-hr deg C. Cost shall include making of fillets, cleaning & preparation of surface, expansion joints at suitable intervals etc all complete for following.	--		
a	Average 50 mm thickness of foam concrete	SQM	21,707	.0052447
A504	Providing and applying bitumen felt water proofing for heavy treatment having bonding materials consisting of blown type conforming to IS: 702 or residual bitumen conforming to IS: 73 or a mixture of the two with seven courses as per IS 1346 using layer of type 2 grade 1 as per IS 7193 and with a minimum overlap of 75 to 100 mm of felt including preparation of surfaces etc all complete for following base felts (For description of layers refer specification):	--		
a	With hessian base felt	SQM	601	.000315
b	With glass fiber base felt	SQM	18,700	.0063963
c	With fiber base felt	SQM	48	.0000217

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
506.0	Providing and applying PU based water proofing treatment with one coat of polyurethane or any other equivalent material based primer with an application rate of minimum 6 sq.m per litre and two successive liquid coatings of high solids content urethane pre-polymers or equivalent material based finish coats as per relevant IS/ASTM standards to form an elastomeric membrane with overall dry film thickness 1.5 mm subject to minimum 500 gm/sqm/coat application rate. Item includes surface preparation by applying polymerized mortar, polyscrim cloth /fabric for edges, joints & vulnerable points etc all complete as per specifications and directions of engineer in charge.	SQM	1,000	.000323
A507	Providing and laying wearing course consisting of 40mm thick plain cement concrete of grade M15 (1:2:4) with graded aggregate of 12.5mm size cast in panels of maximum size 1.2mx1.2m and reinforced with 0.56 mm dia. galvanised chicken wire mesh and sealing of joints (in grooves of 6mm X 6mm) using silicon /elastomeric compound etc all complete.	SQM	10,477.507	.0023847
508.0	Providing and laying cement concrete chequered flooring tiles of 22 mm thickness and size 250x250 mm / 300x300 mm conforming to IS 13801 with 8 mm thick 1:4 cement mortar over the top most layer of roofing treatment in pathway and entire equipment area with fine joints including sealing of joints (silicon/elastomeric sealant) etc all complete. (Water proofing paid elsewhere)	SQM	4,633.5	.0019811
509.0	Providing and applying two coats of bitumen grade 85/25 as per IS 702 (@ 1.7kg/sqm)with 1% antistripping compound conforming to IS 6241 in foundation, wall, column etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete.	SQM	6,591.693	.00034
511.0	Providing and mixing water proofing compound conforming to IS:2645 in concrete or cement mortar all complete.	KG	4,630	.0000516
512.0	Anti termite chemical treatment of soil with Chloropyrifos emulsifiable concentrates (1%) conforming to IS :8944 all complete.	SQM	8,800	.0003652

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
513.0	Providing and applying concrete structures two coats of ERPB (Epoxy resin based anticorrosive and chemical resistant paint) over a coat of CPCI (concrete penetrating bipolar corrosion inhibitor) with 300 to 325 micron DFT for protection of concrete against carbonation and chloride penetration in saline/marine environment all complete of approved make and as per manufacturer's recommendation	SQM	150	.0001326
A515	Providing and applying waterproofing treatment for the concrete surfaces of underground structure in contact with soil/ash including surface preparation etc. all complete with following layers:-	--		
a	For base slab, a 75 mm thick layer of PCC 1:4:8 followed by 25mm thk Cement Mortar 1:3 mixed with approved water proofing compound at the rate specified by the manufacturer. Over this two coats of acrylic polymer modified cement based flexible water proofing membrane of approved make laid as per manufacturer specification and instruction. Over water proofing membrane, 25mm thk Cement mortar 1:3 mixed with approved water proofing compound at the rate specified by the manufacturer provided, over which protective layer of 15mm thk kota / cuddapa or equivalent stone with joints sealed with cement mortar 1:3 shall be laid. Over this stone layer, 25mm thk Cement mortar 1:3 mixed with approved water proofing compound at the rate specified by the manufacturer shall be applied.	SQM	3,697	.002615
b	For side walls, two coats of acrylic polymer modified cement based flexible water proofing membrane of approved make laid as per manufacturer specification and instruction followed by 25mm thk Cement Mortar 1:3 mixed with approved water proofing compound at the rate specified by the manufacturer. Protective layer of 15mm thk kota / cuddapa or equivalent stone with joints sealed with Cement Mortar 1:3 shall be laid. Finally 25mm thk Cement Mortar 1:3 mixed with approved water proofing compound at the rate specified by the manufacturer shall be applied.	SQM	9,741.6	.0054443
c	Providing and painting with 1.5 mm thick polyurea coating meeting ASTM D-16, Type V to concrete surface etc complete as per specification.	SQM	30,705.58	.0030249
--	600 JOINTS AND FILLERS	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
--	Joints & fillers including all labour, material, equipment, transportation, handling etc at any level as per specification, drawings and as directed by engineer - in - charge.	--		
A601	Supplying and installation of Dura board HD100 or its equivalent as approved by the Engineer, as filler material in joints including nailing, installation as per manufacturer's recommendation etc. all complete.	--		
a	12 mm wide joints	SQM	300	.0000721
b	20 mm wide joints	SQM	221	.0000858
c	25 mm wide joints	SQM	650	.0003113
d	50 mm wide joints	SQM	3,065	.0028137
AA60 1	Supplying and installation of commercial quality of expanded polystyrene products from reliable manufacturers as approved by the Engineer, as filler material in joints including nailing, installation as per manufacturer's recommendation etc. all complete.	--		
a	12 mm wide joints	SQM	125	.0000291
b	20 mm wide joints	SQM	158	.00004
c	25 mm wide joints	SQM	354	.0000981
d	50 mm wide joints	SQM	100	.0000478
602.0	Providing and applying polysulphide based sealant conforming to IS:12118 in expansion joints in concrete including cleaning of joints, raking out groove, application of primer, scaffolding etc. all complete for following size grooves:	--		
a	12mm X 25mm	RM	678	.0001244
b	20mmX25mm	RM	685	.0002023

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
c	25mmX25mm	RM	1,863	.0006782
d	50mmX25mm	RM	768	.0005399
603.0	Supplying and filling in position hot applied bitumin sealing compound (Grade A) confirming to IS 1834 including cleaning, mixing, heating, pouring/injecting sealing compound in gaps in joints including application of primer etc. all complete.	--		
a	10mm X 40mm	RM	500	.0000297
b	12mm X 25mm	RM	600	.0000349
c	20mmX25mm	RM	200	.0000123
604.0	Supplying and filling in position hot applied bitumin sealing compound (Grade B) confirming to IS 1834 including cleaning, mixing, heating, pouring/injecting sealing compound in gaps in joints including application of primer etc. all complete.	--		
a	10mm X 40mm	RM	100	.0000059
b	12mm X 25mm	RM	110	.0000064
c	20mmX25mm	RM	100	.0000062
605.0	Providing and sealing of joints with premium grade silicon sealant (Silpruf of GE silicones or approved equivalent) including cleaning of joints, raking out groove, joint filler tapes, application of primer, curing, scaffolding etc. all complete as per manufacturer's recommendation for following size groove:	--		
a	25mmX25mm	RM	150	.0001499
b	50mmX25mm	RM	50	.000084

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
606.0	Providing and fixing PVC water stops in joints conforming to IS 12200 & IS 15058 all complete for the following:	--		
a	150 mm wide and 8 mm thick	RM	100	.0000108
b	230 mm wide and 8 mm thick	RM	100	.000017
c	150 mm wide and 6 mm thick	RM	100	.0000087
d	230 mm wide and 6 mm thick	RM	956.72	.0001202
A608	Providing and installing PVC joint sealing strips of minimum 3mm thickness and minimum width 100 mm at the construction, expansion and isolation joints from reputed manufacturers as a continuous diaphragm to contain the filler material and/or to exclude passage of water or any other material into or out of the structure, without any longitudinal joint; and shall be procured and installed in largest practicable lengths having a minimum number of transverse joints with jointing procedure as per the manufacturers recommendations including the material and tools required for jointing, testing, protection, etc all complete. The joints in rubber seals shall be vulcanised as needed.	SQM	320	.0001025
A609	Providing and installing strong and tough alkathene sheet or equivalent of about 1 mm in thickness in isolation joints and shall be fixed by an approved adhesive compound on the cleaned surface of the already set concrete as per the manufacturers recommendations, to cover it fully including the material and tools required for jointing, testing, protection, etc all complete.	SQM	158	.0000722
A610	Providing and applying approved fire retardant sealant in joints/openings including cleaning of joints/openings, raking out groove, application of primer, scaffolding etc. all complete.	SQM	200	.0001347
--	700 MS EMBEDMENTS	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
--	Embedments including all labour, material, equipment, transportation, handling etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--		
701.0	Supply, fabricating and fixing of mild steel embedments, inserts, pipe sleeves, angle pieces, rungs of various diameters, plates of dimensions as required etc. including welding, bolting, cutting, drilling, scaffolding, setting etc. all complete.	MT	100	.0037575
702.0	Same as above with BHEL supplied material free of cost including loading, transportation, unloading etc. all complete from BHEL store to plant site.	MT	50	.0004629
703.0	Fixing of embedments, inserts, pipe sleeves, angle pieces, anchor bolts of various diameters, plates of dimensions as required etc. including scaffolding, setting in position, transportation from BHEL site stores to work spot etc. all complete.	MT	52	.0005938
704.0	Supply, Fabrication, transportation, delivery at site and erection, installation and alignment of mild steel foundation bolt assembly conforming to IS:2062 and grade 1 of IS:432 in concrete along with nuts, lock nuts (as per IS:1363, 1364 and IS:3138), washers, anchor plates, stiffner plates, protective tape, pipe sleeves, templates etc. including welding, cutting, grinding, threading, drilling etc. all complete.	MT	40	.0018413
705.0	Supplying, fabricating, erecting and installing following items in concrete/brickwall for all kind of works, including setting material in concrete, layout, scaffolding, cutting, forming, grinding, drilling, bolting, welding, jointing, testing etc. all complete.	--		
a	MS pipes of all diameters	Quintal	72	.0003646
b	PVC pipes / conduits of all diameters	Quintal	108.16	.0005513
c	UPVC pipes / conduits of all diameters	Quintal	50	.0002549
d	Expansion fasteners (mechanical galvanised) of HILTI make or equivalent of safe tensile capacity as specified below for brick work with expansion sleeve of A6 polyamide:	--		
i	Upto 250 kg	Each	100	.0000258

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
ii	Beyond 250 Kg and upto 500 kg	Each	100	.0000374
iii	Beyond 500 Kg and upto 750 kg	Each	100	.0000546
e	Expansion fasteners (mechanical galvanised) of HILTI make or equivalent of safe tensile capacity as specified below for concrete work with expansion sleeve of stainless steel:	--		
i	Upto 250 kg	Each	100	.0000546
ii	Beyond 250 Kg and upto 500 kg	Each	100	.000069
iii	Beyond 500 Kg and upto 750 kg	Each	100	.0001034
706.0	Placing, locking and releasing of Vibration Isolation spring modules over the foundation at all elevations including providing all assistance under the supervision of the supplier, transportation from BHEL store, necessary staging, platforms, leveling, alignment etc. all complete.	Each	371	.0020006
--	800 GROUTING	--		
--	Grouting including all labour, material, equipment, roughening surface, cleaning, ramming, curing etc. at any level unless otherwise specified as per specification, drawings and as directed by engineer - in - charge.	--		
A801	Providing & grouting with cement slurry mix of approved ratio using pressure pump for water retaining concrete structures as per approved procedure including cost of nipples/nozzles, cement, admixture, curing, pressure pumps, slurry agitator etc. all complete. Cost shall include fixing of nipples at minimum 500 mm centre to centre spacing, cutting of nipples after completing of grouting, making good of the nipple hole with appropriate non-shrink cement paste, water tightness test etc. all complete wherever specified in the drawing. (Measurement is to be done in Kg of dry grout consumed.)	KG	350	.0002218

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
802.0	Providing & grouting of pocket holes, pipe sleeves under base plates, machinery, pipe supporting structures etc. with mix 1:1 (1 cement :1 sand) using non shrink admixture etc. all Complete.	CUM	24.99	.0006162
803.0	Providing & grouting of pocket holes, pipe sleeves and under base plate of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with mix 1:1:2 (1 cement : 1 coarse sand : 2 aggregate of 6 mm down graded stonechips) using non shrink admixture. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor).	CUM	25	.0001943
804.0	Providing & grouting of pocket holes, pipe sleeves and under base plates of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with CombextraGP-1 or equivalent. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM	61.57	.001169
805.0	Providing & grouting of pocket holes, pipe sleeves and under base plates of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing, etc. all complete with Combextra GP-2 or equivalent. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM	7	.0001314
--	900 DOORS, WINDOWS, VENTILATORS, LOUVERS	--		
--	Doors, windows, ventilators, louvers, roof ventilators, rolling shutters, partitions including all labour, material, equipments, master key system, transportation, handling, preparation of working drawings etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
901.0	Providing and fixing wooden frame conforming to IS 4021 made of best quality seasoned CP teakwood free from large or loose knots, cracks or other defects including sand paper smoothening, hold fasts, beading, primer and finish painting / polishing etc. all complete with proper wood joinery, accurately set to required lines or levels and rigidly secured in place. (Finish painting / polishing paid separately)	CUM	20	.0011024
903.0	Providing, fitting and fixing solid core flush door shutter as per IS 2202 part II, 35mm thick homogenous particle board bonded with BWP type phenolformaldihyde synthetic resin, partical board core conforming to IS 3087 type I, 35x12 mm thick teakwood beading all around including preparation of working drawings. godrej or equivalent make mortice lock with handels on both sides,approved ISI mark anodised fittings like door stopper,300mm long tower bolts,16x300mm long aldrops ,125mm long handles on both sides etc. butt hinges, sliding bolt, knobs, (all fittings shall be anoidised aluminium color dyed), finish synthetic paint over primer, screws etc. all complete as per drawing, specification and instruction of engineer in charge. with commercial faces and teak wood edges. (Finish painting paid separately)	SQM	42.11	.0002401
A903	Providing, fitting and fixing teak veneered solid core flush door shutter (MDF exterior grade) as per IS 2202 part II, 35mm thick homogenous particle board bonded with BWP type phenolformaldihyde synthetic resin, partical board core conforming to IS 3087 type I, 35x12 mm thick teakwood beading all around including preparation of working drawings. godrej or equivalent make mortice lock with handels on both sides,approved ISI mark anodised fittings like door stopper,300mm long tower bolts,16x300mm long aldrops ,125mm long handles on both sides etc. butt hinges, sliding bolt, knobs, (all fittings shall be anoidised aluminium color dyed), screws etc. all complete as per drawing, specification and instruction of engineer in charge. with commercial faces and teak wood edges.	SQM	100	.0006307

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
AA90 3	Providing, fitting and fixing factory made prelaminated solid core flush door shutter (MDF exterior grade) as per IS 2202 part II, 35mm thick homogenous particle board bonded with BWP type phenolformaldihyde synthetic resin, partical board core conforming to IS 3087 type I including preparation of working drawings. godrej or equivalent make mortice lock with handels on both sides,approved ISI mark anodised fittings like door stopper,300mm long tower bolts,16x300mm long aldrops ,125mm long handles on both sides etc. butt hinges, sliding bolt, knobs, (all fittings shall be anoidised aluminium color dyed), screws etc. all complete as per drawing, specification and instruction of engineer in charge	SQM	5	.0000314
904.0	Providing and fixing single or double steel door shutters with 45mm thk flush design shutter comprising of two outer sheets of 18 gauge steel sheets rigidly connected and reinforced inside with continuous vertical 20 gauge stiffeners, spot welded in position at not more than 150mm on centres including void filled with mineral wool (density as per specification), all fittings, Godrej or equivalent make mortice lock with handle on both sides, shop and final painting etc all complete.	SQM	164.11	.0004787
905.0	Providing and fixing single or double steel door shutters with 18 gauge M.S. sheets shutter presenting a flush surface on the outside and inside stiffened with semitubular edge and central stiffening rail which shall convey the lock including fixtures, Godrej or equivalent make mortice lock with handle on both sides, shop and final painting etc all complete.	SQM	1.584	.0000059

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
906.0	Providing and fixing anodized extruded aluminium doors (single or double shutter) conforming to IS:1948, IS:1949 fabricated from extruded sections of HINDALCO/JINDAL or equivalent make having minimum 3mm wall thickness as per IS:1285, IS:733 and anodized and electro color coating of required shade as per IS 1868 (minimum anodized coating of grade AC15). fixed with rawl plugs, expansion fasteners,SS screws / fixing clips necessary filling of gaps at Junctions, at top, bottom & sides with required PVC / neoprene felt for bi-metallic protection etc. Glazing shall be clear float glass of 6mm thickness including snap fit type beading, concealed screws, fixtures, Godrej or equivalent make Mortice lock with handle on both sides, etc all complete. Aluminium section shall be smooth, free of stains, straight, mitred & jointed mechanically wherever required. (Glazing shall be paid separately)	SQM	6	.0000267
907.0	Providing and fixing fire proof steel doors (single or double shutter) with panic devices shall be 45mm thk flush design comprising of two outer sheets of 18 gauge steel sheets rigidly connected and reinforced inside with continuous vertical 20 gauge stiffeners, spot welded in position at not more than 150mm on centers including all fittings, shop painting with approved post office/signal red color fire resistant paint and mineral wool insulation (64 kg/cum density) complete and shall be fire proof as per IS:3614, TAC requirements and as per specification. Minimum ratings shall be 2 Hrs.(Panic devices to be provided at hand over.)	SQM	314.16	.0020762
908.0	Providing and fixing steel windows/ventilator with steel sections as per IS:1038, IS:1361 & IS:7452 latest revision.including all fittings, metal beadings, hold fasts, shop and final painting ,glazing etc. all complete. (Glazing shall be paid separately)	--		
a	openable type	SQM	100	.0002213
b	fixed type	SQM	360	.0007508

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
909.0	Providing and fixing anodised aluminium work of Jindal, Hindalco or other equivalent approved make for door frames, windows, ventillators, partitions, railing, grills etc with extruded standard tubular and other sections including all fittings & fixtures and accessories of approved make conforming to IS733 and IS1285, anodised and electro color dyed to required shade according to IS 1868 (minimum anodic coating of grade AC15), fixed with rawl plugs, expansion fasteners, SS screws or with fixing clips, including necessary filling of gaps at junctions, at top, bottom and sides with required PVC/neoprene felt for bi-mettalic protection etc.including preperation of working drawings, aluminium cleat angle, aluminium snap-on-beading for glazing/panelling, stair case tread nosing, with all fittings and fixtures (like Godrej or equivalent make Mortice lock with handle on both sides, tower bolts, handles, door stopper with rubber shoes, 'L' drops, stays, floor springs, hydraulic door closures etc.), CP brass/stainless steel screws, providing and fixing hinges/pivots, and making provision for fixing of fitting wherever required including cost of PVC/neoprene gasket, all complete as per drawing, specification and instructions of engineer in charge (Glazing and panelling shall be paid seperately).Weight of aluminium section only shall be measured.	Kg	65,986.797	.0161872
910.0	Providing and fixing of aluminium composite panel(ACP) of following thickness with PVDF or polyester coating for interior partition of approved shade ,color etc all complete as per specification.	--		
c	5mm	SQM	48	.0001397
911.0	Providing and fixing of door closers as per IS 3564 ,of approved make & quality all complete of following type :	--		
a	Over head hydraulic door closures	Each	39	.0000416
b	Floor mounted Hydraulic door closers	Each	41	.0000562

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
912.0	Providing and fixing pressed steel frames fabricated from 16 gauge M.S sheet mortised, reinforced drilled and tapped for hinges and locks bolts strikes, hold fasts adjustable floor anchors, floor tiles/weather bars ,paintings etc all complete as per specifications.	Kg	8,887	.0008427
A913	Providing and fixing in position rolling shutter of hot rolled double dipped galvanised steel lath section of 18 SWG tested mild steel strips at 75mm rolling centres interlocked together through their entire length and jointed together at the end by end locks mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking (with push and pull operation for hand operated only) including wire springs, top cover, primer & shop coats of approved enamel paint etc, all complete as per IS 6248 and specification of approved make of following types: The bottom lath shall be coupled to a lock plate fabricated from 3mm thick galvanised steel plate and securely riveted with stiffening angles.(partly coiled and lath/full lath).	--		
a	Hand Operated	SQM	52	.0002069
b	Mechanically Operated	SQM	208.5	.0008961
c	Electrically operated	SQM	238	.0011307
914.0	Providing and fixing PVC doors(25 thk double skin) of sintex or equivalent make including all fitting & fixtures as per specification, drawing and instructions of engineer in charge.	SQM	88.357	.000169
915.0	Providing, fixing and fitting of glazing of first grade class in steel/aluminium/wooden frames, where ever required, cleaning after fixing including hardware, gaskets, clips, beadings etc. all complete.	--		
a	4 mm thick clear sheet glass	SQM	1,549.5	.0004257
b	4 mm thick clear float glass	SQM	10	.0000029

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
c	5.5 mm thick clear float glass	SQM	21	.000008
d	6 mm thick wired glass	SQM	4,233.3	.001794
e	6mm thick Polycarbonate sheet multi (twin) wall fire retardant and ultra violet resistant with sealed open edges.	SQM	91.5	.000126
f	4 mm thick ground glass	SQM	294.92	.000101
g	6 mm thick tinted heat reflecting type float glass	SQM	85	.0000417
Ag	6 mm thick clear float glass	SQM	9.24	.0000039
h	6 mm thick clear toughened safety glass	SQM	50	.0000331
i	Two nos. 6 mm thick clear toughened float glass hermetically sealed and separated by 12 mm thick air gap for thermal insulation (only single elevation area to be measured)	SQM	200	.000343
j	Two nos. 6 mm thick tinted toughened float glass hermetically sealed and separated by 12 mm thick air gap for thermal insulation (only single elevation area to be measured)	SQM	149	.0002632
k	One outer 6mm thick tinted heat-reflecting type float glass and one inner 6mm thick plain float glass hermetically sealed and separated by 12 mm thick gap for thermal insulation (only single elevation area to be measured).	SQM	96	.000142
l	6 mm thick laminated glass	SQM	96	.0000867
916.0	Supplying and fixing weather stripping of approved make and quality to doors as per instructions of engineer in charge and specification complete.	RM	100	.0000144
917.0	Providing and fixing 12 mm thick BWP particle board, decorative veneer (prelaminated) on both sides, as panels in aluminium framed door shutter, fixed with necessary snap-on-beading etc. all complete (excluding aluminium works).	SQM	1,000	.0024283

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
919.0	Providing and fixing 1 mm thk. MS sheet sliding shutters with frame and diagonal braces of 50X50X6 angle iron, 3 mm MS gusset plates at junction and corners, 25 mm dia pulley, 50X50X6 angle and T-iron guide at the top and bottom respectively including painting etc. all complete.	SQM	50	.000098
920.0	Roof skylight structure for atrium with 6mm thick Polycarbonate sheet multi (twin) wall fire retardant and ultra violet resistant with sealed open edges for sky light for approved shape like dome, pyramidal etc. Joints are properly sealed with sealant, screws with pvc cap, self tapping screws, epdm rubber gasket.etc all complete as per detailed drawing and specification.	SQM	150	.0003916
A921	Supplying, installing and commissioning of self sliding mechanism for aluminum door (double shutter) including photo operated sensors, fittings, motors, mechanical systems, electrical systems, warranty all inclusive in working condition as per specifications and drawings (aluminum and glazing to be paid separately)	EACH	6	.0001647
A922	Providing and fixing of wooden panels of veneered BWP grade plywood including teakwood baton grid for interior partition including fittings, fixtures etc all complete as per specification.	SQM	185	.0002126
A923	Providing and fixing 12 mm square MS rod grills for security on windows/ventilators including fixtures, painting etc. all complete.	SQM	643	.000995
A924	Providing and fixing polished teakwood handrail on stainless steel/MS posts all complete as per specification and directions of engineer in charge (stainless steel/MS posts to be paid elsewhere)	CUDM	316	.0003483
--	1000 BRICKWORK	--	--	--
--	Brickwork masonry including all labour, material, equipment, transportation, handling, scaffolding etc. at all levels as per specification, drawings and as directed by engineer - in - charge.	--	--	--

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1001	Providing brick work in cement mortar 1:5 (1 part cement 5 parts coarse sand) in walls, chambers etc. in thickness varying from 230mm to 460mm at all depths, places and positions below plinth including raking out joints, curing, scaffolding etc. complete excluding plastering and painting.	--		
a	Using fly ash lime/cement bricks confirming to IS 12894 with crushing strength of 75 kg/cm ²	CUM	100	.000269
c	Using burnt clay bricks of class designation 7.5 of nominal dimension	CUM	147	.0004183
1002.0	Providing brick work in cement mortar 1:6 (1 cement 6 coarse sand) in walls, chambers etc. in thickness 230mm at all heights, places and position above plinth including raking out joints, curing, scaffolding etc complete excluding plastering and painting.	--		
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm ²	CUM	50	.0001409
A1002	Providing brick work in cement mortar 1:5 (1 cement 5 coarse sand) in walls, chambers etc. in thickness 230mm at all heights, places and position above plinth including raking out joints, curing, scaffolding etc complete excluding plastering and painting.	--		
a	Using fly ash lime/cement bricks confirming to IS 12894 with crushing strength of 75 kg/cm ²	CUM	7,093	.0197845
c	Using burnt clay bricks of class designation 7.5 of nominal dimension	CUM	759	.0022352
1003.0	Providing brick work in cement mortar 1:4 (1 cement 4 coarse sand) in partition walls, chambers etc. in thickness 115mm at all heights, places and position above or below plinth/graded level including providing two nos. 8 mm diameter TMT bars at every fourth layer, raking out joints, curing, scaffolding etc complete excluding plastering and painting as per specification. (TMT bars to be paid elsewhere)	--		
a	Using fly ash lime/cement bricks confirming to IS 12894 with crushing strength of 75 kg/cm ²	SQM	20	.0000081

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1003	Providing brick work in cement mortar 1:4 (1 cement 4 coarse sand) in partition walls, chambers etc. in thickness 115mm at all heights, places and position above or below plinth/graded level including providing two nos. 8 mm diameter TMT bars at every fourth layer, raking out joints, curing, scaffolding etc complete excluding plastering and painting as per specification. (TMT bars to be paid elsewhere)	--		
a	Using fly ash lime/cement bricks confirming to IS 12894 with crushing strength of 75 kg/cm ²	SQM	80.65	.0000328
A1004	Providing brick soling including spreading of earth, ramming, watering including 25mm thick cushion of sand complete but excluding excavation and disposal of surplus earth (excavation and disposal of surplus earth shall be measured under applicable item). Using brick on edge.	--		
a	Using fly ash lime/cement bricks confirming to IS 12894 with crushing strength of 75 kg/cm ²	SQM	100	.0000297
A1005	Providing brick soling including spreading of earth, ramming, watering including 25mm thick cushion of sand complete but excluding excavation and disposal of surplus earth (excavation and disposal of surplus earth shall be measured under applicable item).- Using flat bricks.	--		
a	Using fly ash lime/cement bricks confirming to IS 12894 with crushing strength of 75 kg/cm ²	SQM	90	.0000218
1006.0	Breaking of existing brick work at all levels including plastering, removing the rubbish up to a distance of 500 m including transportation, loading, unloading etc. all complete as directed by the engineer.	CUM	91	.0001443
1007.0	Providing and encasing of structural steel member with masonry work around flanges, webs etc. and filling the gap between steel and masonry by minimum 12mm thick mortar. Encased member shall be wrapped with chicken wire mesh with 50mm lap etc. complete as per specification. (Chicken wire mesh to be paid separately)	CUM	49	.0001443

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1008.0	Providing and laying 75 mm thick bed of dry brick aggregate including of excavation, disposal of surplus earth spreading of earth, ramming, watering etc. complete in all respects as directed by the engineer.	SQM	10	.0000031
1009.0	Making openings in existing brick wall or partition wall including making good the broken edges/surface with cement mortar etc. complete.	CUM	63	.0001798
1010.0	Supply and placing in position mild steel wire fabric of square mesh 25 mm size and wire diameter of 2 mm for encasing of steel sections in concrete including cutting, bending, fixing etc. complete.	SQM	2,995	.0004744
A1010	Supply and placing in position chicken wire mesh at the junction of RCC/Structural steel and brickworks including cutting, bending, fixing etc. complete.	SQM	100	.0000061
1011.0	Filling existing brick wall/ partition wall opening at all level including making good the broken edges/surface with cement mortar, painting, finishing to match with existing finishing, scaffolding/supporting at any level, removal of debris upto a lead of 1 km including loading, unloading, transportation etc. all complete.	SQM	67	.000051
1012.0	Providing and filling brick bats in soak pits all complete.	CUM	85	.0001683
--	1100 DAMP PROOF COURSE	--		
--	Damp proof course including all labour, material, equipment, transportation, handling, shuttering, centering, curing etc at any level as per specification, drawings and as directed by engineer - in - charge.	--		
A1101	Providing Damp Proof Course 50mm thick 1:1.5:3 concrete (10mm and down graded aggregate) with 2% of approved admixture of water proofing compound all complete. Two layers of hot bitumen coating 85/25 grade as per IS:702 @ 1.7Kg./sqm shall be applied one before & one after the DPC.	SQM	221.8	.0000464
--	1200 CEMENT MORTAR PLASTER	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
--	Cement mortar plaster including making grooves wherever required including all labour, material, scaffolding, curing etc at any level as per specification, drawings and as directed by engineer - in - charge.	--		
1201. 0	Providing 18mm thick plaster in two layers outside the building/boundary wall in cement mortar 1:6 on walls, finished to a smooth finish including providing 3mmx3mm size grooves at junctions of two dissimilar materials all complete.	SQM	100	.0000119
A1201	Providing 20mm thick plaster in two layers outside the building/boundary wall in cement mortar 1:6 on walls, finished to a smooth finish including providing 3mmx3mm size grooves at junctions of two dissimilar materials all complete.	SQM	9,175.8	.0012988
AA12 01	Providing 20 mm thick in 2 coats, 1st coat of 12 mm thick in Cement Mortar 1:3 & 2nd coat of 8 mm thick in Cement Mortar 1:2 sand faced outside/inside the building/boundary wall finished to a smooth finish including providing 3mmx3mm size grooves at junctions of two dissimilar materials all complete.	SQM	100	.0000147
1202. 0	Providing 12mm thick plaster inside the building/boundary wall in cement mortar 1:6 on walls finished to a smooth finish as per specification all complete.	SQM	100	.0000086
A1202	Providing 12mm thick plaster inside the building/boundary wall in cement mortar 1:3 on walls finished to a smooth finish as per specification all complete.	SQM	47,786.301	.0042511
1203. 0	Providing 12mm thick plaster in cement mortar 1:3 on walls with rough finish all complete.	SQM	2,742	.0002387
1204. 0	Providing 6mm thick plaster on ceiling in cement mortar 1:4 finished to a smooth all complete.	SQM	3,687.15	.0002786
A1204	Providing 6mm thick plaster on ceiling in cement mortar 1:3 finished to a smooth all complete.	SQM	200	.0000153
1205. 0	Providing 12mm thick plaster in walls, drains/culverts with a paste of neat cement @ 1kg/sqm and rubbed smooth with trowel etc. all complete.	SQM	100	.0000093

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1206.0	Providing and making decorative plaster of all types and design on walls, ceilings, arcs, columns with various thickness upto 18 mm including finishing all complete.	SQM	20	.0000059
1207.0	Forming groove of uniform size from 12X12 mm upto 20X15 mm in plastered surface as per approved pattern, using wooden battens nailed to the under layer, including removal of wooden battens, repair of the edges of plaster panel and finishing the groove etc. complete as per specification, drawing and the instructions of engineer in charge.	RM	60	.0000028
1208.0	Providing drip coarse on plastered surface at all elevations for all type of work such as chajjas, parapet, projections etc. including scaffolding, finishing etc. complete with all labour, tools and plants as per specification, drawing and instructions of engineer in charge.	RM	765	.0000606
1209.0	Providing and laying encasement to box type steel beams at all levels with lath plaster 50 mm nominal thickness with cement plaster (1:4) over chicken wire mesh including all labour, materials, equipment, handling, transporting, mixing, placing, leveling, curing and cleaning, finishing the exposed surfaces etc including centering and shuttering all complete as per specification, drawing and instructions of engineer in charge (chicken wire mesh to be paid separately)	SQM	445	.0001654
1210.0	Ruled pointing in masonry in CM 1:3 (1 cement and 3 fine sand) including raking out joints, curing etc. complete.	SQM	10	.0000014
--	1300 FINISHES TO CONCRETE / PLASTERED SURFACES	--		
--	Finishes, painting to concrete, plastered surfaces including all labour, material, equipment, surface preparation, scaffolding etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--		
1301.0	Two or more coats of white wash/ colour wash as per IS 627 of approved brand and manufacture to give an even shade including a priming coat as per specifications.	SQM	1,680	.0000364

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1304.0	Two or more coats of acrylic distemper of approved brand and manufacture to give an even shade including a priming coat with distemper primer complete.	SQM	200	.0000154
A1304	Two or more coats of acrylic washable distemper of approved brand and manufacture to give an even shade including a priming coat with distemper primer complete.	SQM	50,469.578	.0039085
1305.0	Providing and applying two or more coats of acrylic emulsion paint as per IS 5411 of approved brand, shade and manufacture to give smooth, hard, durable & glossy finish over a coat of primer over prepared plaster surface as per manufacturers guideline.	SQM	14,241.5	.0010302
1306.0	Providing and applying 2 or more coats of acid/alkali resistant paint of approved brand and colour to floors, walls and ceiling including preparation of surface to receive paint, providing and applying bitumen primer confirming to IS 158 complete all as per manufacturer's recommendations and as approved by engineer, at all heights above or below grade level, complete as per specifications.	SQM	50	.0000104
A1306	Providing and applying 2 or more coats of chlorinated rubber based paint of approved brand and colour to floors, walls and ceiling including preparation of surface to receive paint, providing and applying primer complete all as per manufacturer's recommendations and as approved by engineer, at all heights above or below grade level, complete as per specifications.	SQM	5,426.962	.0006327
1307.0	Two or more coats of fire resistant transparent paint as per IS 162 on all woodwork over french polish as per IS 348 or flat oil paint as per IS 137 of approved grade and manufacture to give an even shade as per specifications.	SQM	25	.0000068
1308.0	Two or more coats of black anti-corrosive bitumastic painting of approved brand and manufacture to give an even shade complete.	SQM	100	.0000171
1310.0	Providing and applying 3 coats of water proof cement paint of approved make and color on exterior surface at all heights including material, labour, scaffolding, curing etc including primer coat complete as per specification.	SQM	200	.0000076

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1311	Providing and applying resin bonded granular textured finish of vineratex or equivalent, for external applications shall consist of crushed stone/quartz chips of .5 mm to 2.5 mm size and of approved natural color/shade and bonded with synthetic resins, adhesives and additives altogether in a single pack mix, applied on cured and dried plaster surface with a dry film thickness of minimum 2 mm. The final finish shall have UV resistance, fungus, bacterial resistance properties all complete with grooves filled with poly sulfide sealant of matching color and shade as per specification/drawing/approval of engineer in charge.	SQM	372	.0000811
1312.0	Providing and applying 2 mm thick plaster of paris punning on walls including preparation of surface, staging, etc. to achieve a smooth even surface all complete as per specification and as directed by Engineer.	SQM	19,027.18	.0006384
1313.0	Providing and applying ready made Epoxy Paint over areas other than steel structure with suitable pigments of approved shade as per specification and direction of Engineer. The epoxy paint shall be a two pack material and shall be resistant to water, oil, splash, spillage & acidic environment. The epoxy paint coating shall be of minimum 4 mm thickness.	SQM	150	.0000367
A1316	Providing and applying two coats of Epoxy coating with suitable pigments of approved shade as per specification and direction of Engineer. The epoxy paint shall be a two pack material and shall be resistant to water, oil, splash, spillage & acidic environment. The epoxy paint coating shall be of minimum 150 micron thickness over epoxy primer.	SQM	2,542	.0005107
--	1400 FLOORING AND SKIRTING	--		
--	Flooring and skirting at any level including base layer, labour, material, equipments, transportation, handling, curing, polishing etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1401.0	Providing and laying 50 mm thick heavy duty cement concrete in flooring with metallic hardener pigmented topping 12mm thick uniform graded treated iron paricles in flooring. Under layer of 38mm thick cement concrete mix 1:2:4 (1 cement: 2 sand : 4 stone aggregates 12.5mm well graded) and top layer of 12mm thick metallic concrete of mix 1:2 (1 cement hardner mix with approved quality metallic hardening compound :2 stone aggregate 6mm nominal size) by volume including cement slurry, rounding off edges, aluminium strips etc. all complete for following (Quoted item rate shall be inclusive of providing glass joint strips):	SQM	50	.0000123
A1401	Providing and laying 50 mm thick granolithic heavy duty cement concrete in flooring with non-metallic hardener pigmented topping 12mm thick in flooring. Under layer of 38mm thick cement concrete mix 1:1:2 (1 cement: 1 sand : 2 stone aggregates 12.5mm well graded) and top layer of 12mm thick non-metallic concrete of mix 1:2 (1 cement hardner mix with approved quality non-metallic hardening compound :2 stone aggregate 6mm nominal size) by volume including cement slurry, rounding off edges, aluminium strips etc. all complete for following (Quoted item rate shall be inclusive of providing glass joint strips)	SQM	26,809.633	.0072811
AA14 01	Providing and laying 50 mm thick granolithic heavy duty cement concrete in flooring of cement concrete mix 1:1:2(1 cement: 1 sand : 2 stone aggregates 12.5mm well graded) including cement slurry, rounding off edges, aluminium strips etc. all complete for following (Quoted item rate shall be inclusive of providing glass joint strips)	SQM	17,832	.0042746
A1402	Providing and laying 25 mm thick granolithic heavy duty cement concrete mix 1:1:2 (1 cement: 1 sand : 2 stone aggregates) flooring with non-metallic hardener pigmented topping of 10 mm thick uniform graded particles in skirting and dado complete as per specification.	SQM	383	.0000584
AA14 02	Providing and laying 25 mm thick granolithic heavy duty cement concrete mix 1:1:2 (1 cement: 1 sand : 2 stone aggregates) flooring in skirting and dado complete as per specification.	SQM	209	.0000265

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1403	Providing and laying precast polished heavy duty cement concrete tiles (Carborundum topping) of size 300X300X22 thick of approved shade as per IS 1237, including cement mortar bedding of 1:3 (1 cement : 3 sand) jointed with neat cement slurry etc. all complete with pigment to match the shade of the tiles including rubbing, curing, grinding and polishing complete with laying as per IS 1443 etc. all complete for following:	--		
a	Laid in floors	SQM	8,491	.0044308
b	Laid in skirting	SQM	160	.0000886
1405.0	Providing and laying 50 mm thick floor finish with 20mm thk Terrazo Tiles including cement mortar bedding of 1:3 (1 cement : 3 sand) with neat cement slurry etc. all complete.	SQM	50	.000025
A1405	Providing and laying 25 mm thick wall finish with cast in situ Terrazo including provision of base and etc. all complete.	SQM	50	.000026
1406.0	Providing and laying polished Kota stone 18mm to 20mm thk in flooring. Under bed shall average 30mm thk of 1 cement : 2 sand : 4 stone aggregates by volume and brought to proper level. The kota stone slabs/tiles laid over under bed, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with thick cement slurry spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM	47.586	.0000279
1408.0	Providing polished Kota stone 18mm to 20mm thk in skirting projecting 6mm from adjacent plaster including cutting brickwall upto the required depth, edging, finishing etc. all complete.	SQM	50	.0000328

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1412.0	Providing and laying 18-20mm thick polished Granite stone of approved color and texture in flooring with brass/ stainless steel strips. Under bed shall average 30mm thk of 1 cement : 2 sand : 4 stone aggregate by volume and brought to proper level. The granite stone slabs/tiles laid over under bed, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with thick cement slurry spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM	50	.0000925
1413.0	Providing and laying 14 to16mm thick polished Granite stone of approved color and texture in flooring with brass/ stainless steel strips. Under bed shall average 35mm thk of 1 cement : 2 sand : 4 stone aggregate by volume and brought to proper level. The granite stone slabs/tiles laid over under bed, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with thick cement slurry spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM	234	.0003727
1414.0	Providing and laying polished Granite stone 18-20mm thk in skirting and dado with 6mm thick projection from adjacent plaster including mortar ,cement slurry ,pigments, curing, grinding,moulding, granite polishing etc. all complete.	SQM	10	.0000194
1415.0	Providing and laying polished Granite stone 14-16mm thk in skirting and dado with 6mm thick projection from adjacent plaster including mortar ,cement slurry ,pigments, curing, grinding,moulding, granite polishing etc. all complete.	SQM	12	.0000203
A1416	Providing and laying vitrified ceramic tiles of polished variety of size 600x600 from reputed / approved manufacturer, complete including underbed of cement mortar 1:3 with neat cement slurry etc. all complete for following	--		
a	8 mm thick tiles In flooring	SQM	9,228.809	.0042034
Aa	7.5 mm thick tiles In flooring	SQM	50	.0000221
b	8 mm thick tiles in skirting and dado upto specific height	SQM	1,023	.0004951

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
Ab	7.5 mm thick tiles in skirting and dado upto specific height	SQM	25	.0000118
A1417	Providing and laying heavy duty anti skid ceramic tiles of matt finish of size 300x300mm from reputed / approved manufacturer including underbed of 43mm thick cement concrete mix 1:2:4 (1 cement: 2 sand : 4 stone aggregates 12.5mm well graded) etc. all complete for following.	--		
a	7mm thick tiles In flooring	SQM	1,406.338	.000604
c	7mm thick tiles In skirting and dado upto specific height	SQM	1,630.62	.001226
1418.0	Providing and laying 10 mm thk non-skid fully vitrified tiles of make 'MARBONITE' or 'FERRASTONE of BOSS Profile limited' or equivalent in flooring and skirting over 30 mm thick underbed of 1 part cement and 3 parts coarse sand by weight mixed with sufficient water, complete as per specification laid in pattern of following sizes	--		
a	400X400 mm	SQM	26	.0000138
b	600X600 mm	SQM	24	.000016
A1418	Providing and laying 8 mm thk non-skid fully vitrified tiles of make 'MARBONITE' or 'FERRASTONE of BOSS Profile limited' or equivalent in flooring and skirting over 40 mm thick underbed of 1 part cement and 3 parts coarse sand by weight mixed with sufficient water, complete as per specification laid in pattern of following sizes	--		
a	400X400 mm	SQM	764	.0004326
b	600X600 mm	SQM	1,049	.0006718
A1419	Providing and laying granite stone slab of 12 mm thickness single piece for wash basin / sink slab /facia of black or approved colour with cutting,making corners,moulding and opening etc. all complete.	SQM	10	.0000186

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1420.0	Providing and laying Heavy Duty dust pressed Ceramic Tiles of 7mm thick of reputed manufacturer of approved finish shade and colour including underbed of cement mortar 1:3 with neat cement slurry etc. all complete.	--		
a	300X300 mm	SQM	205	.0000741
b	600X600 mm	SQM	100	.0000419
1421.0	Providing and laying Heavy Duty dust pressed (grade-5) Ceramic Tiles (Matt Finish) of size 600x600mm(approved size) and 7mm thick of reputed / approved manufacturer (Kajaria,jhonson,Spartek or equivalent) of approved finish, shade and colour. The tiles shall be scratch resistance of minimum 5 on Mohr's scale and shall have a bending strength of 350 Kg./sqm,with Under bed shall average 43mm thk of 1 cement : 2 sand : 4 stone aggregates by volume and brought to proper level including cement mortar all complete.	SQM	20	.0000104
A1422	Providing & fixing Acid / Alkali resistant (Chemical resistant) tiles confirming to IS:4457 in flooring/Dado and shall be laid over bitumastic lining of min 12mm thick (to be laid in layers of 6mm each). The tiles shall be applied with 13 mm thick Potassium Silicate bedding mortar as per IS:4441, 4443 & 4832 and including preparation of surface, application of bitumen primer, curing etc. all complete for following thicknesses. The tiles should be abrasion resistant & durable.	--		
a	25mm thick	SQM	10,399.895	.016792
b	38mm thick	SQM	20	.0000308

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1424.0	Providing & fixing chemical resistant (AR)(Acid / Alkali) bricks (75mm thick) conforming to IS:4860 in the floor of neutralization pit. Surface on which lining to be applied shall be prepared in accordance with IS:2395. Bitumen primer as per IS:158 followed by 18mm thick bituminastic followed by 6mm thick potassium silicate mortar bedding shall be provided before laying AR bricks. The joints between AR bricks shall be filled with resin type of mortar conforming to IS:4832, part II, seal coat of readymade epoxy paint shall be provided on joints to cover up any porosity that may be left in mortar. End sealing shall be done with bituminastic AR bricks shall be laid with 6mm wide & 50mm deep pointing (epoxy / furnace / CNSL) & acid curing shall be done all complete as per specification.	SQM	244	.0005891
A1424	Providing & fixing chemical resistant (AR)(Acid / Alkali) bricks (115mm thick) conforming to IS:4860 in the wall of neutralization pit. Surface on which lining to be applied shall be prepared in accordance with IS:2395. Bitumen primer as per IS:158 followed by 18mm thick bituminastic followed by 6mm thick potassium silicate mortar bedding shall be provided before laying AR bricks. The joints between AR bricks shall be filled with resin type of mortar conforming to IS:4832, part II, seal coat of readymade epoxy paint shall be provided on joints to cover up any porosity that may be left in mortar. End sealing shall be done with bituminastic AR bricks shall be laid with 6mm wide & 50mm deep pointing (epoxy / furnace / CNSL) & acid curing shall be done all complete as per specification.	SQM	498	.0017144

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
AA14 24	Providing & fixing chemical resistant (AR)(Acid / Alkali) bricks (38mm thick) conforming to IS:4860. Surface on which lining to be applied shall be prepared in accordance with IS:2395. Bitumen primer as per IS:158 followed by 12mm thick bituminastic followed by 6mm thick potassium silicate mortar bedding shall be provided before laying AR bricks. The joints between AR bricks shall be filled with resin type of mortar conforming to IS:4832, part II, seal coat of readymade epoxy paint shall be provided on joints to cover up any porosity that may be left in mortar. End sealing shall be done with bituminastic AR bricks shall be laid with 6mm wide & 50mm deep pointing (epoxy / furnace / CNSL) & acid curing shall be done all complete as per specification.	SQM	369	.0005978
1425. 0	Providing and laying polished Marble slabs (Aranga white or equivalent approved shade/color /design) 20 mm thk in staircase landing/skirting and corridors over minimum 20 mm thick underbed of 1 cement : 2 sand : 4 stone aggregates by volume mixed with sufficient water to form a stiff workable mass. The marble slabs shall be laid over under-bed, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with thick cement slurry spread over the surface with fine joint finished including moulded marbel nosing, pigments, curing, grinding, making corners, granite polishing etc. complete.	SQM	1	.0000063
1427. 0	Providing and fixing glazed ceramic tiles of approved color and design of size 200x300mm / 300x300mm in dado of approved size, projecting 6mm uniformly from adjacent plaster or wall finish. The mix for underbed plaster shall consist of 1part cement and 3 parts sand by weight. fairly moist but firm, tiles shall be pressed over under bed by applying cement slurry including pigments, curing etc all complete for following thicknesses:	--		
a	5mm thick	SQM	750	.0003402
A1428	Providing and laying 2 mm thick antistatic PVC flooring / skirting of approved shade,as per IS:3462 and laying as per IS:5318 all complete.	SQM	450	.0002865

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1429	Providing and fixing removable type flooring system (Height of floor 800 mm)consisting of fire resistant particle board of size 600X600X35 mm with 0.05 mm thick aluminium foil lining at bottom and with 2 mm thick anti static PVC topping including proprietary floor supporting system complete as per specification.	SQM	750	.0028407
1430.0	Providing and fixing dividing strips in joints of cast in situ floorings at various elevations, finishing, all labour, material etc. complete as per drawing, specification and instructions of engineer in charge.	--		
a	Glass strips 40 mm wide and minimum 6 mm thick.	RM	25	.0000005
b	Aluminium strips 40 mm wide and minimum 3 mm thick	RM	25	.0000022
c	Brass strips 20 mm wide and minimum 4 mm thick.	RM	145	.0000249
--	1500 ROOFING / SIDE CLADDING	--		
--	Roofing / side cladding work including all labour, material, equipment, transportation, handling, scaffolding, laps, hooks, washers, corner pieces etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1501	Designing, providing and fixing permanently color coated galvanised MS troughed metal sheet decking plate of approved colour and conforming to class3 of IS 14246 over roof purlins for cast-in-situ roof slab as per relevant IS code and specification. Bare metal thickness of deck plate shall be minimum 0.8mm with minimum trough depth of 44 mm having minimum yield strength of 250 MPa and shall serve as permanent shuttering to the roof slab 100mm thick measured over crest of metal decking & shall have adequate strength to support weight of green concrete and imposed loads of min 150 kg/sqm during construction between purlins as per manufacturer's recommendations/ calculations/ test certificates for approval including fixing of plates to purlins, side lapping, end lapping etc. all complete for below mentioned spans. The sheet shall be permanently coated with silicon modified polyester paint of minimum 20 micron DFT on exposed surface (facing operating floor) and minimum 7 micron on other face over epoxy primer applied over hot dipped galvanising @ 275 gm/sqm including fixing of sheet to purlin with self drilling white zinc plated heat treated carbon steel screws of minimum 5.6 mm dia @ 260mm c/c in the trough and stich screws between two adjacent sheets and sealing with epoxy sealant. Measurement of profile sheeting shall be of the plan area of roof covered by MS trough metal decking.	--		
a	Span Upto 1800mm	SQM	5,257	.0020778

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
AA15 01	Designing, providing and fixing permanently color coated galvanised MS troughed metal sheet decking plate of approved colour and conforming to class3 of IS 14246 over floor beams for cast-in-situ slab as per relevant IS code and specification. Bare metal thickness of deck plate shall be minimum 0.8mm with minimum trough depth of 44 mm having minimum yield strength of 250 MPa and shall serve as permanent shuttering to the slab 150mm thick measured over crest of metal decking & shall have adequate strength to support weight of green concrete and imposed loads of min 150 kg/sqm during construction between beams as per manufacturer's recommendations/ calculations/ test certificates for approval including fixing of plates to beams, side lapping, end lapping etc. all complete for below mentioned spans. The sheet shall be permanently coated with silicon modified polyester paint of minimum 20 micron DFT on exposed surface (facing operating floor) and minimum 20 micron on other face over epoxy primer/phosphate primer applied over hot dipped galvanising @ 275 gm/sqm including fixing of sheet to purlin with self drilling white zinc plated heat treated carbon steel screws of minimum 5.6 mm dia @ 260mm c/c in the trough and stich screws between two adjacent sheets and sealing with epoxy sealant. Measurement of profile sheeting shall be of the plan area of floor covered by MS trough metal decking.	--		
a	Span Upto 1700mm	SQM	1,608.35	.0006488
b	Span Exceeding 1700mm and upto 2500 mm	SQM	818	.0003354

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
AAA1 501	Designing, providing and fixing permanently cold rolled troughed profile sheets manufactured from tested quality CR rolls as per IS:513 over roof purlins for cast-in-situ roof slab as per specification and relevant IS codes. Bare metal thickness of deck plate shall be minimum 0.8mm with minimum trough depth of 44 mm having minimum yield strength of 250 MPa and shall serve as permanent shuttering to the roof slab 100mm thick measured over crest of metal decking & shall have adequate strength to support weight of green concrete and imposed loads of min 150 kg/sqm during construction between purlins as per manufacturer's recommendations/ calculations/ test certificates for approval including fixing of plates to purlins, side lapping, end lapping etc. all complete for below mentioned spans including Pre treatment and Phosphating of sheet with application of primer and final paint coating as per specification and fixing of sheet to purlin with self drilling white zinc plated heat treated carbon steel screws of minimum 5.6 mm dia @ 260mm c/c in the trough and stich screws between two adjacent sheets and sealing with epoxy sealant. Measurement of profile sheeting shall be of the plan area of roof covered by MS trough metal decking.	--		
a	Span Upto 1800mm	SQM	12,000	.0051367

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
AB15 01	Designing, providing and fixing permanently cold rolled troughed profile sheets manufactured from tested quality CR rolls as per IS:513 over floor beams for cast-in-situ floor slab as per specification and relevant IS codes. Bare metal thickness of deck plate shall be minimum 0.8mm with minimum trough depth of 44 mm having minimum yield strength of 250 MPa and shall serve as permanent shuttering to the floor slab 150mm thick measured over crest of metal decking & shall have adequate strength to support weight of green concrete and imposed loads of min 150 kg/sqm during construction between beams as per manufacturer's recommendations/ calculations/ test certificates for approval including fixing of plates to beams, side lapping, end lapping etc. all complete for below mentioned spans including Pre treatment and Phosphating of sheet with application of primer and final paint coating as per specification and fixing of sheet to beam with self drilling white zinc plated heat treated carbon steel screws of minimum 5.6 mm dia @ 260mm c/c in the trough and stich screws between two adjacent sheets and sealing with epoxy sealant. Measurement of profile sheeting shall be of the plan area of roof covered by MS trough metal decking.	--		
a	Span Upto 1700mm	SQM	1,620	.0005598
b	Span Exceeding 1700mm and upto 2500 mm	SQM	2,654	.0009131
1502. 0	Providing and fixing shear connectors of mild steel studs having 16mm dia and minimum 75 mm projected length above purlin passing through metal decking as per relevant IS codes and specification.	QUINTAL	151	.003965

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1503.0	Designing, providing and fixing External sheet of Permanent colour coated metal cladding with troughed M.S. sheets of 0.6mm bare metal thickness having minimum yield strength 250 MPa and zinc-aluminium alloy coating not less than 150 gm/sqm total on both sides including fixing to supports / rails by concealed/exposed fixing system, corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing etc. all complete. The exposed face of the sheet shall be permanently colour coated with Polyfluro Vinyl Coating (PVF2) of minimum dry film thickness (DFT) 20 microns over suitable primer. Inner face of the sheet shall be provided with suitable pre-coating of minimum DFT 7 microns over suitable primer. The permanent colour coated sheet shall meet the general requirements of IS : 14246 and shall conform to class 3 for the durability.	SQM	100	.0000388
A1503	Designing, providing and fixing External sheet of Permanent colour coated metal cladding with troughed M.S. sheets of 0.6mm bare metal thickness having minimum yield strength 250 MPa and zinc-aluminium alloy coating not less than 150 gm/sqm total on both sides including fixing to supports / rails by concealed/exposed fixing system, corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing etc. all complete. The exposed face of the sheet shall be permanently colour coated with Polyfluro Vinyl Coating (PVF2) of minimum dry film thickness (DFT) 20 microns over suitable primer. Inner face of the sheet shall be provided with same paint of minimum DFT 12 microns over suitable primer. The permanent colour coated sheet shall meet the general requirements of IS : 14246 and shall conform to class 3 for the durability.	SQM	3,715	.0014533

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1504.0	Designing, providing and fixing External sheet of Permanent colour coated metal cladding with high strength tensile steel sheet 0.5mm bare metal thickness having minimum yield strength 350 MPa and zinc-aluminium alloy coating not less than 150 gm/sqm total on both sides including fixing to supports / rails by concealed/exposed fixing system, corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing etc. all complete. The exposed face of the sheet shall be permanently colour coated with Polyfluro Vinyl Coating (PVF2) of minimum dry film thickness (DFT) 20 microns over suitable primer. Inner face of the sheet shall be provided with suitable pre-coating of minimum DFT 7 microns over suitable primer. The permanent colour coated sheet shall meet the general requirements of IS : 14246 and shall conform to class 3 for the durability.	SQM	13,800	.0045875
A1504	Designing, providing and fixing External sheet of Permanent colour coated metal cladding with high strength tensile steel sheet 0.5mm bare metal thickness having minimum yield strength 350 MPa and zinc-aluminium alloy coating not less than 150 gm/sqm total on both sides including fixing to supports / rails by concealed/exposed fixing system, corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing etc. all complete. The exposed face of the sheet shall be permanently colour coated with Polyfluro Vinyl Coating (PVF2) of minimum dry film thickness (DFT) 20 microns over suitable primer. Inner face of the sheet shall be provided with same paint of minimum DFT 12 microns over suitable primer. The permanent colour coated sheet shall meet the general requirements of IS : 14246 and shall conform to class 3 for the durability.	SQM	4,040	.0013583

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1505.0	Designing, providing and fixing Inner sheet of Permanent colour coated metal cladding with troughed M.S. sheets of 0.6mm bare metal thickness having minimum yield strength 250 MPa and zinc-aluminium alloy coating not less than 180 gm/sqm total on both sides of both sheets including fixing to supports / rails by concealed fixing system, corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing, Z spacers etc. all complete. The exposed surface of the sheet shall be permanently colour coated with silicon modified polyester paint of minimum dry film thickness (DFT) 20 microns over suitable primer. Other face of the sheet shall be provided with suitable pre-coating of minimum DFT 7 microns over suitable primer. The permanent colour coated sheet shall meet the general requirements of IS : 14246 and shall conform to class 3 for the durability. The sheet shall be fixed directly to side runners and Z spacers as per IS : 277. The sheet shall be fixed at the rate not more than 1500mm center to center to hold the insulation and external sheeting.	SQM	13,000	.0049438
1506.0	Providing and fixing insulation of resin bonded mineral wool of 50 mm nominal thickness conforming to IS 8183 having a density of 32 kg/cum glass wool or 48 kg/cum for rock wool, for cladding/under deck insulation including application of glue and tying with lacing wire, for glass/rock wool as per manufacturer's recommendations.	SQM	6,639	.0026824
1507.0	Providing and fixing insulation of resin bonded mineral wool of 50 mm nominal thickness conforming to IS 8183 having a density of 32 kg/cum glass wool or 48 kg/cum for rock wool, for cladding/under deck insulation including wrapping in black polythene black supported over weld mesh 75X75X1.6 MM dia to hold in position and application of glue & tying with lacing wire, for glass/rock wool as per manufacturer's recommendation.	SQM	5,246	.0027859
1508.0	Providing and installing under deck insulation using minimum 0.05 mm thick aluminium foil on exposed surface followed by 0.56 mm dia and 24 Gx 25 mm mesh GI wire netting, fixed at various elevations with rawl plugs including clips but excluding cost of insulation.	SQM	404	.0002508

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1508	Providing and installing fire resistant under deck insulation using Lloyd Foam or equivalent 50 mm thick polyurethane Foam including minimum 0.05 mm thick aluminium foil on exposed surface followed by 0.56 mm dia and 24 Gx 25 mm mesh GI wire netting, fixed at various elevations with rawl plugs including clips.	SQM	11,191	.0067032
1509.0	Providing and fixing non metal opaque PVC sheet similar to ONDEX roofing or equivalent including all fixing accessories.	SQM	50	.0001275
1510.0	Providing and fixing 1 mm thick corrugated/semicorrugated G.I. sheet in roofs, cladding of minimum galvanisation of 275 gsm total on both sides with minimum 150mm overlapping, 8 dia G.I. hook bolts or 'J' Bolts and nuts @305 mm c/c along with G.I. and bitumen washers including cutting of sheets for opening etc. all complete.	SQM	585	.0016454
1511.0	Designing, providing and fixing External roof cladding sheet of Permanent colour coated with troughed M.S. sheets of 0.6mm (or high tensile steel sheet of 0.5mm minimum thickness) for side cladding bare metal thickness having minimum yield strength 250 MPa and zinc-aluminium alloy coating not less than 275gm/sqm total on both sides including fixing to supports / rails by concealed fixing system, corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing etc. all complete. The exposed face of the sheet shall be permanently colour coated with Polyfluro Vinyl Coating (PVF2) of minimum dry film thickness (DFT) 20 microns over suitable primer. Inner face of the sheet shall be provided with suitable pre-coating of minimum DFT 12 microns over suitable primer. The permanent colour coated sheet shall meet the general requirements of IS : 14246 and shall conform to class 3 for the durability.	SQM	50	.0001131
--	1600 FALSE CEILING	--		
--	False ceiling including all labour, material, equipment, transportation, handling, suspension system etc at any level as per specification, drawings and as directed by engineer - in - charge.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1603.0	Providing and fixing permanently colour coated aluminium false ceiling of approved colour and Luxalon 84 C or approved equivalent with corrosion resistant aluminium alloy panels of minimum thickness 0.5mm including 50mm thick mineral wool insulation(density 48 kg/cum) conforming to IS:8183 bound in polythene bags on top of panels. Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures, A.C. ducts etc all complete. Suitable M.S. channel grid with minimum MC 75 shall also be provided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC ducts etc. (Materials for structural platform grid made up of MS Channels/ Beams / Angles shall be supplied by BHEL and shall be paid under ST No 2301)	SQM	50	.0000615
A1603	Providing and fixing permanently colour coated aluminium false ceiling of approved colour (closed type plain panels) or approved equivalent with corrosion resistant aluminium alloy AA5050 panels of minimum thickness 0.5mm fixed on roll formed carriers. Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures, A.C. ducts etc all complete. Suitable M.S. channel grid with minimum ISMC175 shall also be provided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC ducts etc. (Materials for structural platform grid made up of MS Channels/ Beams / Angles shall be supplied by BHEL and shall be paid under ST No 2301)	SQM	9,121.88	.0163185

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1606.0	Providing and Fixing 12mm thick Gypsum board plain/perforated false ceiling tiles(600x600mm) of India Gypsum or equivalent make in plan or elevation with aluminium grid, metal suspension system, anchor fastener adjustable hangers etc. including one coat of primer, two or more coats of acrylic emulsion paint of approved colour to give an even shade with smooth finish all complete.as per architectural design and detail.metal suspension system as per ASTM C-635 shall be hot dipped M.S.galvanized (grade 180 as per is :277) nominal size of T-section shall be 24 x 38 mm or 24 x 25 mm cross runners. 24mm wide exposed flange surface shall be permanently color coated.suspension system shall be as per manufacturer's specification supported over movement platform.The work to be complete as per specifications, drawings and direction of engineer.(Materials for structural platform grid for movement made up of MS Channels/ Beams / Angles shall be supplied by BHEL and shall be paid under ST No 2301)	SQM	50	.0000287
--	1700 RAIN WATER DOWN TAKE PIPES	--	--	--
--	Rain water down take pipes including all labour, material, transportation, 2 coats of approved paint over one primary coat, fixtures, accessories etc at any level as per specification, drawings and as directed by engineer - in - charge.	--	--	--
1702.0	Providing and fixing galvanised MS down take pipes of 100 mm dia- Medium quality as per IS:1239(part-I) / IS:3589 all complete.	RM	191	.0001062
1704.0	Providing and fixing galvanised MS down take pipes of 150 mm dia- Medium quality as per IS:1239(part-I) all complete.	RM	230	.0001804
1705.0	Providing and fixing UPVC down take pipes of 110mm diameter- Class 3 as per IS:4985 all complete.	RM	89	.0000132
1706.0	Providing and fixing UPVC down take pipes of 160mm diameter- Class 3 as per IS:4985 all complete.	RM	50	.0000131

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1708.0	Providing and fixing HDPE down take pipes conforming to IS:4984 as per specification of following diameters.	--		
a	110 mm Dia	RM	424	.0001126
b	160 mm Dia	RM	2,097.5	.0010841
c	150 mm Dia	RM	50	.0000258
d	200 mm Dia	RM	528	.0004031
--	1800 MISCELLANEOUS WORKS	--		
--	Miscellaneous works including all labour, material, equipment etc. at any level unless otherwise specified as per specification, drawings and as directed by engineer - in - charge.	--		
1801.0	Providing and Filling in trenches, plinths, area paving and other underground structures with graded stone aggregate of size range 63 mm to 45 mm in layers not exceeding 230 mm in thickness including breaking of stone boulders to required sizes, filling the interstices with selected sand and compacting to 85 % of original volume of stone stack for all lifts etc. all complete. Payment shall be made for the measurement of the volume of the compacted fill.	CUM	14,594.21	.016127
1803.0	Anti termite chemical treatment of soil with Chlorpyriphos/Lindane E.C. 20% with 1% concentration conforming to IS:8944 and as per IS 6313 all complete. (Plinth area of building at ground floor only shall be measured for payment)	SQM	100	.0000041
1804.0	Supply and installation of approved 25mm thick vibration damping resilient pads on/around foundation of vibrating equipment and at other locations all complete.	SQM	50	.000646

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1805.0	Providing 50mm thick premix carpet surfacing laid to slope in two layers 30mm and 20mm respectively with 12mm downgraded stone chips mixed with 80/100 grade bitumen @ 52 Kg/Cu.M including compaction etc. all complete.	SQM	1,240	.0002468
1806.0	Providing 50mm thick anti corrosive layer laid to required slope consisting of clean & well graded coarse sand mixed with A90 grade bitumen for softening point upto 45 degree Celcius or A65 grade bitumen for softening point above 45 degree celcius as per IS: 73 or its equivalent quality 8 to 10% by volume and rolled or compacted all complete.	SQM	286.83	.000044
1807.0	Providing and fixing G.I strips minimum 1.5mm thk and 150mm wide including fixing accessories etc. all complete.	Kg	100	.0000091
1808.0	Providing and fixing aluminium strips minimum 18 SWG thk and 300mm wide over expansion joints with minimum lap of 50mm length including brass / aluminium screws, rawl plugs etc. all complete.	Kg	790	.0002424
1809.0	Providing Chemical injection grouting with pressure pump for water retaining concrete structures conforming to IS:6494, including fixing nozzles, cost of approved cement, admixture, curing etc. all complete . Payment shall be made as per the consumption of chemical grout.	Kg	100	.0000584
1810.0	Providing, laying and fixing rails and guide rails in concrete for transformer, rail track including cutting of rails, joining of rails, anchoring lugs etc all complete.	MT	193	.0095756
1811.0	Providing and fixing weep holes in Drains consisting of 100 mm dia HDPE pipe sleeves with single side covering for the pipe mouth with galvanised welded wire fabric of 20 mm sq. opening covered with 40 mm downgraded aggregates in 300 X 300 mm sq. and 300 mm deep size all complete.	EACH	20	.0000219
1812.0	Laying of earthing mats/rods including risers, transportation from yard stores, loading, unloading, cutting to length, welding, protective painting of joints etc. all complete. (Excavation & Back filling shall be paid separately under respective item of earth work. Earthing mats/rods shall be supplied by BHEL free of cost)	MT	293.5	.0020483

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1813.0	Providing Earthing pit as per drawing with charcoal & salt, GI pipes, GI earth electrodes, GI wire, GI strips, brick chamber with covers including associated earthwork etc. all complete.	EACH	25	.0003172
1814.0	Construction of below ground earthing system test pits as per drawing/ sketches including brickwork, plaster, concreting, reinforcement, formwork, providing & fixing GI strips/pipes, GI wires, covers etc as per drawing & specification including associated earthwork.	EACH	21	.0002665
1815.0	Providing and fixing GI rungs in concrete/brick walls having zinc coating of minimum 900 g/sqm etc. all complete.	Kg	200	.0000156
1816.0	Providing and fixing PVC pressure release valve of minimum dia 90mm in water retaining structure including 160 mm dia housing pipe of minimum length 3.75 m with perforation as per IS4558, nylon jali, perforated end plug, collar, graded filter, excavation, fixing in concrete slab/wall etc. all complete.	EACH	245	.0003324
1817.0	Providing and fixing HDPE pipes in concrete/ brick work of following sizes including cutting, fixing and levelling in position etc. all complete.	--		
a	Upto 75 mm dia	RM	643	.0001147
b	100 mm dia	RM	44	.0000116
c	150 mm dia	RM	317	.0001159
d	200 mm dia	RM	167	.000078
1818.0	Providing and laying dry stone pitching of 230 mm thickness for slope protection in cement mortar 1:6 including hammer dressing, raking of joints, pointing, preparing the bedding surface and voids filling with stone aggregate etc. all complete.	SQM	158	.0000556

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1819	Design, supply, fabrication, erection and epoxy painting of stoplog gates in CW Pumps with embedments required, lifting beams, special tools & plants, spare parts for three years, machining, casting, all materials such as groove of Stainless Steel 316L , stainless steel, brass used for seals, rubber seals, gears, ball and roller bearing, branch bushings, greasing, bolts, nuts, lugs, threaded fastners etc., cleaning, sand blasting, , erection along with a second stage concreting to true plumb and levels, submission of drawings / fabrication drawings for engineers approval etc all complete. The leakage through rubber seal shall not be more than 5 lit/min/metre length of seal under maximum head.(only weight of structural steel including embedments shall be considered for payment purpose). (Stainless Steel component shall be measured seperately for payment)	MT	5	.0003152
A1820	Stainless steel component mentioned under ST No. 1819/A1819/A1821/B1821	MT	2	.0005187
A1821	Supplying, fabricating, erecting in position and testing / examining bolted and / or welded structural steel work for stationary screens made out of stainless steel SS 316L mesh over MS frame including cutting, straightening if required, edge preparation, bolting / welding of joints, cleaning, sand blasting, galvanised with minimum coating of zinc as 750 gms/sqm followed by application of an etching primer and dipping in black bitumen as per BS 3416 etc all complete.(Stainless Steel mesh shall be paid seperately).	MT	5	.0003341
1822.0	Cutting of groove of 10mm X 40mm size with groove cutting machine in concrete paving all complete.	RM	310	.0000492
1823.0	Fire proofing of steel structures with VERMICULITE cementious coating including supply of all materials for vermiculite materials, reinforcement mesh (3mm thick wire, 50x50 size mesh) , nuts, tie wires, weldings, surface preparation, curing, staging, compatible paintings etc. all complete.	CUM	11	.0003107
1824.0	Supply & fixing expanded metal steel sheet conforming to IS:412. Size of mesh shall be 10mmX40mm with strands of 2.5mm width and 1mm thickness to the structural steel for facilitating fireproofing works.	SQM	20	.0000119

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1825.0	Supply and laying approved quality Stone aggregate 40mm size in transformer yards.	CUM	501	.0004969
1826.0	Supply and laying approved quality rounded pebbles / gravels of 40mm size in transformer yards.	CUM	356	.0003531
1827.0	Supply and laying fire clay refractory brick work with fire clay mortar conforming to IS: 6 & 195 including curing etc. all complete on tank pads & in building walls.	CUM	10	.0003926
1828.0	Dismantling old existing reinforced/non-reinforced brickwork/blockwork/stone masonry work in mud/lime/ cement mortar at any level including clearing/cleaning, stacking the serviceable materials at plant site and disposal of unserviceable materials within a lead upto 1km all complete.	CUM	25	.0000555
1829.0	Dismantling old existing plain/re-inforced concrete work at any level including clearing/cleaning, stacking the serviceable materials at plant site and disposal of unserviceable materials within a lead upto 1km all complete.	CUM	25	.0000714
1830.0	Dismantling old existing structural steel work at any level including plates, bolts, cutting rivets, welding, dismembering and stacking the dismantled materials within a lead upto 1km etc all complete.	MT	25	.0002379
A1831	Sprinkling of water by water tanker fitted with perforated GI pipe (portable tanker minimum 3000 litre capacity) for roads and miscellaneous area within plant boundary including using hose for sprinkling water wherever required, for dust suppression and reduction of suspended material at site for day to day work, as directed by BHEL site engineer (water for this purpose shall be provided by BHEL free of cost and utilisation of machine will be in terms of Tank-hour put in actual use for water sprinkling).	TANK-HR	100	.0000381
1832.0	Providing & filling Bentonite Powder (Sodium base) mixed with water in electronic earthing pit as per drawing & direction below ground level including all materials, transportation, labour, incidental etc all complete as per specification.	CUM	15	.0000681

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1833.0	Supply & fixing FRP (fibre reinforced plastic) sheets 2 mm thick including GI hooks/ J or L bolts, nuts, washers, bitumen washers etc. complete including overlap 100mm .	SQM	390	.0004251
A1834	Anti weed chemical treatment of soil with suitable chemical etc all complete.	SQM	100	.0000059
A1835	Providing and placing approved quality of 250 micron thick heavy duty low density polyethylene liner (LDPE) films manufactured from polyethylene resin over cement sand mortar 1:4 in the base of reservoir/pond as well as on side slopes of embankment to prevent seepage including joining with approved method including testing, necessary excavation, fixing at the edges in plain cement concrete by providing 400mm wide and 300mm thick plain cement concrete 1:2:4 on the top of embankment (the cost of plain cement concrete 1:2:4 shall be excluded and shall be payable separately) as shown in the drawing etc all complete as per specification and as directed by the engineer-in-charge. Minimum width of LDPE liner shall be 6m.	SQM	9,086	.000866
A1836	Providing and placing 300mmx300mm size and 75mm thick precast concrete tiles of grade M-20 over 50 mm thick 1cement:4sand mortar on LDPE liner at the bed of reservoir and on side slopes of embankment, filling joints with 1cement : 3sand mortar etc all complete as per specification and as directed by the engineer-in-charge. The rate shall be inclusive of cement sand mortar as well.	SQM	9,086	.0037675
A1838	Providing random rubble (RR) stone masonry in foundation, super structure, boundary wall, retaining wall and embankment with cement mortar 1:6 at all elevations including all labour, material, equipment, handling, scaffolding etc. all complete.	CUM	10	.0000176
A1839	Providing and fixing sliding layer of bitumen paper or craft paper over the screed layer for water retaining structures to destroy the bond between the screed and the base slab concrete of the water retaining structure etc all complete.	SQM	100	.0000124

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A1843	Design of scheme and layout for Rain water Harvesting system for the plant in consultation with Central ground water authority/Board or State ground water authority or MOEF authorized agency, submission to BHEL/TANGEDCO, incorporation of comments in submitted scheme and layout to finally obtain approved scheme and layout from BHEL/TANGEDCO including all necessary expenses, consultancy charges etc. all complete as per specification.	LUMPSUM	1	.0015847
--	2000 FENCING AND GATES	--	--	--
--	Fencing and gates including all labour, material, equipment etc at any level as per specification, drawings and as directed by engineer - in - charge.	--	--	--
2001.0	Supplying and erecting in position 2.4 m high PVC coated galvanised chain linked fencing of minimum 8 gauge (including PVC coating) of mesh size 75mm x 75mm. The diameter of the hot dip galvanised steel wire for chain link fencing excluding PVC coating shall not be less than 12 gauge. GI barbed wire fencing of height of 600 mm confirming to IS 298 at top of chain link fencing shall be provided with 4 strands of barbed wire hot dip galvanised wire of 12G comprising of 2 ply of wires with barbs of 16G spaced at 100mm. Cost to include for GI hook bolts, rings & washers, hot dip galvanised tension wires, 25X6 mm GI flat stretcher bar at end posts, accessories etc. all complete. (Structural post shall be separately under item 2007)	RM	25	.0000328

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2003.0	Supplying and erecting in position 2.4 m high PVC coated galvanised chain linked fencing of minimum 8 gauge (including PVC coating) of mesh size 75mm x 75mm. The diameter of the hot dip galvanised steel wire for chain link fencing excluding PVC coating shall not be less than 12 gauge. Concertina of height of 600 mm at top of chain link fencing shall be provided with all accessories. Concertinal shall be from tensile serrated galvanised wire (HTSW) made with wire diameter of 2.5 mm which will be stretched to 6m and attached on two strands of galvanised HTSSW (high tensile spring steel wire) of 2.5mm dia by means of clips at 1m interval. These two HTSSW strands will be attached to the fence posts/ angles with 12 mm security fasteners. Cost to include for GI hook bolts, rings & washers, hot dip galvanised tension wires, 25X6 mm GI flat stretcher bar at end posts etc. all complete. (Structural post shall be separately under ST No. 2007)	RM	25	.0000363
A2005	Supplying and fixing 1000mm high G.I. barbed wire fencing on top of boundary wall consisting of 8 string barbed wire of 6 guage with 8 strands and with anti climbing arrangement of 50x50x8 Y shaped angles including GI clips, anchors, accessories etc. all complete. (Structural post shall be separately under ST No. 2301)	RM	10	.0000056
2008.0	Supply, fabrication and fixing of mild steel posts for fencing including painting etc all complete.	MT	1	.0000568
2009.0	Supply, fabrication and installing in position and testing galvanised MS Gates out of channels, joists, angles, flats, plates, pipes, welded steel wire mesh & sheets including stiffeners, bracings, fabricated hinges, MS Aldrops with locking arrangement, tempered steel pivot, guide track of MS Tee, bronze aluminium ball bearing arrangements, castor wheels, paintings etc. all complete.	MT	1	.0000488
2010.0	Supply, fabrication and installing in position and testing MS Gates out of channels, joists, angles, flats, plates, pipes, welded steel wire mesh & sheets including stiffeners, bracings, fabricated hinges, MS Aldrops with locking arrangement, tempered steel pivot, guide track of MS Tee, bronze aluminium ball bearing arrangements, castor wheels, paintings etc. all complete as per specification.	MT	67.75	.0032038

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A2011	Supply, fabrication and installing in position Motorized sliding MS gate of approved size and design, erecting and fixing at main entrance including all guides, rails, alignments, control panels, switches, paintings etc all complete as per specification and as directed by Engineer. The gate shall be operable by push button at designated areas at both the guard house and the security office in the Administration / Plant Service area, and by card reader or key switches	MT	18	.0011367
--	2100 WATER SUPPLY	--	--	--
--	Water supply work including men, material, equipment etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--	--	--
2101.0	Providing and fixing in position tested heavy duty type chromium plated (CP) brass long neck bib cocks including sockets, union, nuts etc all complete - 15mm nominal bore.	EACH	113	.0000604
2102.0	Providing and fixing in position heavy duty brass stop cock of approved quality including all specials etc all complete - 15mm nominal bore.	EACH	100	.000051
2103.0	Providing and fixing in position heavy duty brass full way valve with wheel of approved quality including all specials etc all complete for following sizes:	--	--	--
a	25mm nominal bore.	EACH	10	.0000069
b	50mm nominal bore.	EACH	10	.0000107
2104.0	Providing and fixing GI pipes class B medium class conforming to IS:1239 pipes shall be concealed and painted with anticorrosive paint, complete for internal works with GI sockets, unions, elbows, tees, nipples etc and clamps including cutting and making good the walls etc all complete for following sizes:	--	--	--
a	15 mm nominal bore.	RM	100	.0000119

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
b	20 mm nominal bore.	RM	100	.0000152
c	25 mm nominal bore.	RM	50	.000009
2105.0	Providing and fixing GI pipes class B complete for external work with GI sockets, unions, elbows, tees, nipples etc including trenching & refilling, anti-corrosive paint etc all complete for following sizes:	--		
a	15 mm nominal bore.	RM	100	.0000125
b	20 mm nominal bore.	RM	100	.000011
c	25 mm nominal bore.	RM	100	.0000156
d	50 mm nominal bore.	RM	185	.0000492
2106.0	Providing and fixing 610mmx453mmx6mm thk mirror from reputed mirror manufacturer. Mirror shall be mounted with glass adjustable revolving CP brackets with CP screws etc all complete.	EACH	10	.000011
A2106	Providing and fixing 1200mmx900mmx5.5mm thk mirror from reputed mirror manufacturer. Mirror shall be mounted with glass adjustable revolving CP brackets with CP screws etc all complete.	EACH	28	.000045
2107.0	Providing and fixing 610mmx127mmx6mm thk clear glass with C.P Guard rails and mounted on C.P. brackets etc all complete.	EACH	23	.0000194
2108.0	Providing and fixing 25 mm diameter stainless steel towel rails (600mm X 25mm) all complete.	EACH	2	.0000013
2109.0	Providing and fixing 20mm dia chromium plated M.S. pipes wall mounted towel rod with C.P. Brackets etc all complete.	EACH	10	.0000057

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2110. 0	Providing and fixing C.P. soap holder mounted with C.P. screws etc all complete.	EACH	37	.0000204
A2111	Providing and fixing stainless steel liquid soap dispenser. Dispenser shall be round and easily revolving with removable nozzle and mounted on C.P. brackets etc all complete.	EACH	19	.0000129
2112. 0	Providing and fixing glazed vitreous wall mounted paper holder with suitable cover cum cutter fitted with CP screws etc. sll complete.	EACH	10	.0000088
2113. 0	Providing and fixing chromium plated brass shower rose with 15 or 20 mm inlet all complete.	EACH	4	.0000055
A2114	Providing & fixing in position P.V.C. water tank of Syntex or approved equivalent including making all necessary inlet & outlet pipes, fixture, ball cocks, valves etc all complete for following capacities. GI pipes shall be paid separately under ST No. 2105.	--		
a	1000 litres capacity	EACH	9	.0000744
b	2000 litres capacity	EACH	28	.0004632
c	5000 litres capacity	EACH	2	.0000827
d	10000 Liters capacity	EACH	2	.0000766
2115. 0	Providing and fixing approved stainless steel sink with integrated drainboard as per IS:13983 of size 915x460x178mm with CI brackets, stainless steel chain with rubber plug 40mm, cp brass waste trap with necessary union complete including painting the fittings, cutting and making good the wall where required etc. all complete.	EACH	1	.0000059
A2116	Providing and fixing glass shelves 600mmx127mmx4 mm with chromium plated brackets all complete.	EACH	20	.0001147

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A2117	Providing and fixing metal storing cabinets all complete.	EACH	62	.0004152
A2118	Providing Minimum 600 mm long porcelain tray etc all complete..	EACH	51	.00007
A2119	Providing and fixing Recessed porcelain soap tray in shower area etc all complete.	EACH	49	.0000421
A2120	Providing and fixing grab bars, barrier-free access and appropriate fittings and fixtures for toilets for handicapped etc. all complete.	EACH	12	.0000085
--	2200 SANITARY WORKS	--		
--	Sanitary work including all labour, material, equipment etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--		
2201.0	Supply and fixing glazed vitreous china Wash Basin conforming to IS:2556 part 4 of oval shape with R.S. or C.I. brackets painted white, 15mm chromium plated brass hot & cold faucets with nylon washers, chromium plated brass chain with rubber plug, 32mm chromium plated brass bottle trap and waste of standard pattern, 32mm dia chromium plated brass trap unions, plastic connection pipe with chromium plated nuts, fittings, cutting and making good the walls where required etc all complete.	--		
a	White	EACH	12	.000023
b	Colored	EACH	10	.0000211
2202.0	Providing and fixing approved vitreous china laboratory sink of size 600x400x200mm conforming to IS:2556 (part-5) with R.S. or C.I. brackets, chromium plated brass chain with rubber plug 40mm, CP brass waste and 40mm CP brass trap with necessary union complete including painting the fittings, cutting and making good the wall where required etc. all complete.	EACH	5	.0000204
2203.0	Providing and fixing stainless steel kitchen sink of size 610x510x200mm conforming to IS: 13983 including all fittings etc. all complete.	EACH	3	.0000157

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A2203	Providing and fixing stainless steel kitchen sink of size 600x400x200mm conforming to IS: 13983 including all fittings etc. all complete.	EACH	2	.0000098
2204.0	Providing and fixing colour glazed vitreous china European type water closet conforming to IS:2556 with siphon, open front solid plastic seat and plastic cover, low level 12.5 litre PVC flushing cistern (same colour as WC) with valveless fittings, necessary C.P connections etc all complete.	--		
a	Floor mounted	EACH	10	.0000462
b	Wall mounted	EACH	5	.0000272
2205.0	Providing and fixing colour glazed vitreous indian type Orissa pattern (580x440mm) water closet conforming to IS:2556 part 3 with all fittings including foot rests, low level 12.5 litre PVC flushing cistern with valveless fittings, necessary C.P connections etc all complete.	EACH	52	.0002071
2206.0	Providing and fixing white flat back glazed vitreous china urinals of size 440x265x355 mm with photo voltaic control flushing system as per IS:2556 (part 6, section 1) with flush pipes, lead pipes, gratings, traps and necessary C.P. fittings etc. all complete.	EACH	6	.0000239
2207.0	Supply, laying and jointing UPVC pipes of class 3 as per IS:4985 including bends, branches and all other necessary fittings, M.S holder bats/clamps, cutting and making good the walls and floors, jointing, testing etc all complete for following.	--		
a	75mm dia pipes	RM	50	.0000083
b	110mm dia pipes	RM	50	.0000102
c	160mm dia pipes	RM	200	.0000679
d	200mm dia pipes	RM	200	.000084

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A2207	Supply, laying and jointing Supreme B class stoneware pipe including bends, branches and all other necessary fittings, socket and spigot joint, M.S holder bats/clamps, cutting and making good the walls and floors, lead jointing, testing etc all complete for following.	--		
a	110mm dia pipes	RM	500	.0002113
2208.0	Providing, laying light duty non pressure NP3 class RCC pipes with collars jointed with stiff mixture of cement mortar 1:2 including testing of joints etc all complete for following.	--		
a	200mm dia	RM	1,054.5	.0007525
Aa	250 mm dia	RM	50	.0000464
b	300mm dia	RM	50	.0000595
Ab	400mm dia	RM	119	.0001814
c	450mm dia	RM	50	.000098
d	600mm dia	RM	50	.0001081
e	900mm dia	RM	50	.0001418
2209.0	Providing, laying light duty non pressure NP2 class RCC pipes with collars jointed with stiff mixture of cement mortar 1:2 including testing of joints etc complete for following.	--		
a	150mm dia	RM	50	.0000228
Aa	200mm dia	RM	50	.0000323

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
b	250mm dia	RM	50	.0000373
c	300mm dia	RM	50	.000044
d	500mm dia	RM	50	.0001076
2210.0	Providing, laying light duty non pressure NP4 class RCC pipes with collars jointed with stiff mixture of cement mortar 1:2 including testing of joints etc complete for following:	--		
a	400mm dia	RM	48	.0000759
2211.0	Providing and fixing C.I Manhole heavy duty cover of size 600mmx450mm including frame from reputed manufacture etc. all complete.	EACH	10	.000067
A2211	Providing and fixing C.I Manhole heavy duty cover of size 600mmx600mm including frame from reputed manufacture etc. all complete.	EACH	2	.0000177
2212.0	Providing and fixing circular heavy duty C.I. manhole cover of 600 mm dia with frame etc. all complete.	EACH	10	.0000798
2213.0	Providing and fixing square mouth S.W Gully trap grade 'A' complete with CI grating, brick masonry chamber and water tight CI cover with 300x300mm (inside). The weight of cover to be not less than 4.53 Kg and frame to be not less than 2.72 Kg etc all complete for following sizes:	--		
a	100x100mm P or S Type.	EACH	2	.000002
b	150x100mm P or S Type.	EACH	7	.0000096
c	150x150mm P or S Type.	EACH	38	.0000611

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2215.0	Providing and fixing C.I. floor traps with C.P jalli all complete.	EACH	171	.0000816
2216.0	Providing and fixing heavy duty UPVC floor traps with C.P jalli all complete.	EACH	10	.0000151
2217.0	Providing and installing approved brand single tap water cooler of 80 L cooling capacity all complete.	EACH	29	.0010409
2218.0	Providing and installing approved brand single tap water cooler of 150 L cooling capacity all complete.	EACH	12	.0008348
2219.0	Providing and fixing white viterous urinal partitions of size 675x325x85mm all complete.	EACH	5	.0000054
2220.0	Providing and fixing eye and face drinking water fountain (combined unit with receptacle conforming to IS: 10592) all complete as per specification.	EACH	18	.0001548
A2221	Supply, laying and jointing HDPE pipes including bends, branches and all other necessary fittings, M.S holder bats/clamps, cutting and making good the walls and floors, jointing, testing etc all complete for following.	--		
a	75mm dia pipes	RM	132	.0000351
b	110mm dia pipes	RM	100	.0000325
c	160mm dia pipes	RM	100	.0000625
d	200mm dia pipes	RM	250	.0002321
--	2300 STRUCTURAL STEEL	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
--	Structural steel works including all labour, material, equipments, transportation, handling etc. at any level as per specification, drawings and as directed by engineer - in - charge.	--		
2301.0	Supply, fabrication and erection of structural steel with mild steel rolled section / built up section / combination of both conforming to IS:2062, pipes conforming to IS:1161/IS:1239, chequered plate conforming to IS: 3052, mild steel rounds, monorails, stays, safety chains, ladders, MS grating etc. in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames, hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, chequered plate flooring, decking and seal plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails etc including 2 coats of redoxide zinc-chromate primer (one coat at shop and one coat after erection), connection design & preparation of fabrication drgs, collection of steel from stores, fabrication, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of 20o C for welding over 20 mm and upto 40 mm & 660 C for welding over 40 mm and upto 63 mm & 110o C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, surface preparation by means of manual or mechanical power tools as per IS:1477 part 1, touch-up painting, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable), return of surplus / waste steel materials to store etc all complete. Including appointment of a seperate agency, approved by BHEL, for preparation of fabrication drawings & submitting the fabrication drawings to BHEL for review and approval of fabrication drgs, in consultation with BHEL.	MT	20	.0008989

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2301 (a)	Transportation from BHEL stores and Fabrication of structural steel with mild steel rolled section / built up section / combination of both conforming to IS:2062, pipes conforming to IS:1161/ IS:1239, chequered plate conforming to IS: 3052, mild steel rounds, monorails, stays, safety chains, ladders, MS grating etc. in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames, hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, chequered plate flooring, decking and seal plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails etc including 2 coats of redoxide zinc-chromate primer (one coat at shop and one coat after erection), connection design & preparation of fabrication drgs, collection of steel from stores/other agecny yard within site premises, fabrication, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of 20o C for welding over 20 mm and upto 40 mm & 660 C for welding over 40 mm and upto 63 mm & 110o C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, surface preparation by means of manual or mechanical power tools as per IS:1477 part 1, touch-up painting, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable), return of surplus / waste steel materials to store etc all complete. Including appointment of a seperate agency, approved by BHEL, for preparation of fabrication drawings & submitting the fabrication drawings to BHEL for review and approval of fabrication drgs, in consultation with BHEL. Structural steel shall be provided by BHEL free of cost for incorporation in permanent works.	MT	2,951	.0314215

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2301 (b)	Erection of fabricated structural steel material with mild steel rolled section / built up section / combination of both conforming to IS:2062, pipes conforming to IS:1161/ IS:1239, chequered plate conforming to IS: 3052, mild steel rounds, monorails, stays, safety chains, ladders, MS grating etc. in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames, hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, chequered plate flooring, decking and seal plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails etc including transportation of available fabricated materials, it's cleaning, making approach to the material, leftout welding , straightening, making fit for erection without any extra cost to BHEL, 2 coats of redoxide zinc-chromate primer (one coat at shop and one coat after erection), connection design & preparation of fabrication drgs & erection drawing (if required), collection of steel from stores/other agecny yard within site premises, welding, electrodes and other consumables, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of 20o C for welding over 20 mm and upto 40 mm & 660 C for welding over 40 mm and upto 63 mm & 110o C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, surface cleaning , touch-up painting, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable), return of surplus / waste steel materials to store etc all complete.	MT	10,619	.0753789

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
A2301	Transportation of fabricated structural steel from fabrication yard and erection, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of 20oC for welding over 20 mm and upto 40 mm & 660 C for welding over 40 mm and upto 63 mm & 110o C for thickness over 63 mm) wherever applicable, use of low hydrogen electrodes, post heating wherever applicable, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, surface cleaning & touch-up painting, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable). Fabricated structure shall be issued by BHEL free of cost for incorporation in permanent work.	MT	5	.0000361
AA23 01	Carrying out balance fabrication work over incomplete fabricated steel structure as per the instruction of BHEL Engineer in-charge in accordance with drawings and technical specification, etc. all complete. Payment shall be made for the weight of only those steel section, which are required for completion of balance fabrication work over incomplete fabricated steel structure. Weight of incomplete fabricated steel structure (as issued by BHEL) shall not be considered for payment. Incomplete fabricated steel structure shall be issued by BHEL on AS-IS-WHERE-IS basis. Necessary transportation is in the scope of contractor.	MT	5	.0000721
2302. 0	Extra over ST NO. 2301, 2301(a) and 2301(b) for blast cleaning of steel structures to near white metal surface(Sa 2 1/2) and applying epoxy based zinc phosphate primer in coats of minimum 25 micron (DFT) at shop and 25 micron (DFT) after erection, instead of primer coat of red oxide zinc-chromate including touch-up painting etc all complete.	MT	171	.0002115
A2302	Extra over ST NO. 2301, 2301(a) and 2301(b) for blast cleaning of steel structures to near white metal surface(Sa 2 1/2) as per SIS 05-5900 and applying 100 micron total DFT zinc silicate primer(two coats of 50 mm DFT each), instead of two coats of primer of red oxide zinc-chromate including touch-up painting etc all complete.	MT	8,748	.0099573

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2304.0	Providing and applying two coats of synthetic enamel paint with minimum 50 micron total dry film thickness (DFT) of approved make and shade to achieve an even shade over steel sections already having primer coats and keeping overall DFT with primer not less than 110 microns including protection and cleaning, scaffolding etc. all complete.	MT	114	.0000911
A2305	Providing and applying two coats of high built epoxy based colour Finish paint of approved brand with minimum 90 micron Dry film thickness of each finish coat including protection and cleaning, scaffolding etc. all complete.	MT	16,088	.0221718
2306.0	Providing, laying and clamping of crane rails over the crane girder at all elevations as per IS 3443 including all fixtures, clamps, testings etc. all complete as per drawing and specification.	MT	22	.0010512
2307.0	Supplying, fabrication, erection and alignment of factory made electroforged galvanised grating units with mild steel (having minimum galvanisation of 610 g/sqm) conforming to IS:2062 in flooring, platforms, drain and trench covers, walk-ways, passages, staircases with edge binding strips and anti-skid nosing in treads etc. including fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete.	MT	332	.0138671
2309.0	Extra over above ST NO. 2301 for finishing the grating units with hot dipped galvanisation @ 610 gm/sqm over blast cleaned steel surfaces instead of painting with two coats of red oxide zinc-chromate primer all complete.	MT	18	.0001521
2310.0	Providing and fixing in position of permanent mild steel bolts (class 4.6 as per IS : 1367 and grade 'C' as per IS: 1363) and nuts, washers etc. up to and inclusive of 39 mm diameter and upto 300mm long for structural steel work etc all complete.	Quintal	47	.000244
2311.0	Providing and fixing in positring of high strength structural bolts (of property class 8.8 and product grade 'C' as per IS: 1367) and conforming to IS: 3757 and high strength structural hardened and tempered nuts (of property class '8' as per IS:1367) conforming to IS:6623 with hardened and tempered washers as per IS:6649 etc. up to and inclusive of 39 mm diameter and upto 300 mm long for structural steel work etc all complete.	Quintal	990	.0068705

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2312. 0	Dismantling of steel structure, lowering of material and carriage of the dismantled material up to field fabrication shop / projects storage including temporary dismantling, cutting, re-welding, supporting, and restoring to correct position all temporarily dismantled members, re-alignment of all adjacent connected members to their correct positions (weight of such adjacent members and temporarily dismantled members not payable), scaffolding, staging, tools & tackles, gas cutting, welding, consumables etc all complete.	MT	43	.0004092
2313. 0	Addition to, alterations in and/or modification of	--		
a	In erected position	MT	14	.0000888
b	In fabrication yard	MT	31	.000177
2314. 0	Re-erection of dismantled fabricated structural steel members including carriage of modified	MT	36	.0001941
A2316	Supply, fabrication and erection of minimum 6 mm thick stainless steel liner of grade SS 316 L; Finish Grade 2B (Cold rolled, Annealed & Pickled and Skin passed) on M.S. plate for inside surfaces of hopper & mouth of hopper of bunkers including fixing with stainless steel studs, bolting (including countersunk), welding with electrode classification E308L for welding of stainless steel to stainless steel and E309 for stainless steel to mild steel etc. all complete.	MT	14	.0037488
2317. 0	Providing and fixing in position PTFE type sliding bearings of reputed manufacturer, individual bearing suitable for required vertical loads as per the construction drawings and for maximum displacement of +/- 50 mm including all taxes, duties, transportation, installation, drilling, bolting, erecting, aligning etc all complete for following vertical loads.	--		
a	20 Tons	EACH	3	.0000461

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
b	25 Tons	EACH	3	.0000499
c	40 Tons	EACH	11	.0001968
d	50 Tons	EACH	3	.0000565
e	60 Tons	EACH	14	.0002859
2318.0	Providing and fixing flexible open ended bellow strap of neoprene of minimum thickness 2 mm and minimum width 200 mm with aluminium stripped edges as sealing below top of bunker and bottom of tripper floor to avoid the coal dust nuisance all complete.	RM	360	.000411
A2319	Supply, fabrication and fixing of stainless steel hand railing including transportation, loading/unloading etc. all complete as per specification.	MT	12	.0030831
A2320	Supply, fabrication and fixing of GI pipe hand railing (1000 mm high) of 32 mm/40 mm/50 mm dia (Medium Grade) including transportation, loading/unloading, painting etc. all complete..	MT	50	.0026596
2321.0	Conducting radiography test on welds wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM	134	.0001063
2322.0	Conducting ultasonic test on welds wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM	99	.0002135
2323.0	Conducting ultasonic test on steel plates as per ASTM-A435 or equivalent wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	SQM	99	.0003141
2324.0	Conducting magnetic particle test on welds wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM	99	.0000282

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2325.0	Conducting dye penetration test on welds wherever specified by the engineer including provision of necessary equipments, measuring devices, gauges etc. all complete (over and above the work already specified in the specifications.)	RM	278	.0000485
2500.0	PILING	--		
2508.0	Conducting routine load test on single job pile as specified in accordance with IS 2911 (Part-4) including preparation of pile head for testing, necessary excavation, providing all arrangements of loading, unloading, test equipments/accessories, jacks, recording of results, labour, submission of test report etc but excluding the cost of installation of job pile complete as per specification, drawing and as directed by the engineer-in-charge for the following.	--		
a	For vertical compression test by maintained load method	--		
ii	550 mm diameter pile	Each	1	.0000381
iii	600 mm diameter pile	Each	1	.0000508
iv	760 mm diameter pile	Each	1	.0000952
b	For lateral load test	--		
ii	550 mm diameter pile	Each	14	.0002665
iii	600 mm diameter pile	Each	1	.0000222
iv	760 mm diameter pile	Each	1	.0000254
c	For tension/uplift test	--		
ii	550 mm diameter pile	Each	61	.0019349

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
iii	600 mm diameter pile	Each	10	.0004758
iv	760 mm diameter pile	Each	34	.0019413
A2509	Dismantling of concrete in chipping off pile head from existing level to cut-off level as per the drawing and specification and direction of engineer in-charge	CUM	5	.0000131
2509.0	Carrying out low strain pile integrity test on 600mm/760mm diameter pile including all arrangements for test, equipments/accessories, materials, labour, submission of test report etc but excluding the cost of installation of job pile all complete as per specification and as directed by the engineer-in-charge.	Each	5	.0000017
B2509	Providing and laying Design Mix cement concrete (M-30) conforming to IS:456 & IS 10262-2009 for reinforced concrete works with sand and graded hard stone aggregate of 20mm nominal size in pile built-up at any level below finished floor level, any shape, position or thickness etc complete including use of plasticizer/ superplasticizer conforming to IS:9103 (latest) to achieve required slump in concrete all complete as per specification & drawing	CUM	10	.0000458
2512.0	Driving a 550mm diameter empty MS casing pipe with bottom closed with approved detachable MS shoe down to a maximum depth of 30m below ground level using at least 5MTweigh drop hammer and furnishing the set calculation to establish a safe load carrying capacity in vertical compression including providing detachable MS shoe etc all complete	Each	18	.0001199
2513.0	Conducting Dynamic cone penetration Test at specified locations as per IS-4968,Part-II for a maximum depth up to 28m below ground level and submission of approved test report etc as per specification. The rate shall include mobilization of necessary testing equipments etc to the project site and demobilization of same after completion of tests.	EACH	210	.0006662

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
2514.0	Conducting Dynamic cone penetration Test at specified locations as per IS-4968,Part-II for a maximum depth greater than 28m and up to 32m below ground level and submission of approved test report etc as per specification. The rate shall include mobilization of necessary testing equipments etc to the project site and demobilization of same after completion of tests.	EACH	150	.000571
2515.0	Conducting Dynamic cone penetration Test at specified locations as per IS-4968,Part-II for a maximum depth greater than 32m and up to 35m below ground level and submission of approved test report etc as per specification. The rate shall include mobilization of necessary testing equipments etc to the project site and demobilization of same after completion of tests.	EACH	10	.0000476
2600.0	Levelling and Grading	--		
2601.0	Earth work in stripping of top soil upto a maximum depth of 0.20m below ground level so as to exclude all debris, grass, vegetation, bushes, trees having girth upto 300mm including roots and organic materials etc for leveling and grading including dressing to specified levels & grades and compacting the graded/stripped surface by manual/mechanical means, disposal of stripped materials within a lead upto 1km etc all complete as per specification, drawing and as directed by the engineer-in-charge.	Sq.m	100	.0000035
2602.0	Earth work in filling upto any depth below ground level for grading to proper grade and level in layers not exceeding 300 mm loose thickness with approved good quality murram (murram is a borrowed material to be arranged by the bidder) and compacted as specified including supplying murram, royalty/seignorage fee (if any), sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, tesing, all lead and lifts etc all complete as per specification, drawing and as directed by the engineer for the following. Rate to include compaction of ground before starting filling using road roller of 12 T.	--		

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VIII)	CUM	50	.000026
2603.0	Extra over ST No.2601 for carriage of unserviceable material/earth for every 1 km or part thereof beyond an initial lead of 1km.	Cum	50	.0000004
--	MISCELLANEOUS	--		
E1	Consolidation of subgrade/ existing surface with 12 T power roller or vibromax including dozing of dumped ash/earth and making good the undulations with ash and rerolling the subgrade for road, hard surfacing of equipment store, fabrication yard, assembly yard etc as directed by BHEL.	SQM	49,899	.0004732
E2	Providing and laying stone for making erection roads, hard surfacing etc with specified sizes of approved quality hard rock rubble or hand broken hard metal of sizes ranging from 100mm to 150mm, etc in one layers approximately 200mm total thickness including moorum after compaction, hand packing, filling in interstices with quarry spalls/ moorum and providing a morrum layer of 25mm thickness (consolidated) including watering, thoroughly compacting layer with 12 tonne power roller or vibromax with minimum 8 passes etc all as per the direction of the engineer and as per specification.	CUM	1,000	.0007177
E3	Spreading and laying available ash/earth in layers, levelling, compacting with Vibromax or suitable equipment for making it fit to receive a layer of moorum or placement of plates for movement of cranes/heavily loaded trailor etc.	CUM	1,000	.0000284
E4	Providing and fixing Green Net over erected structure to prevent ingress of ash dust in designated areas. (frame work shall be paid in respective item)	SQM	1,000	.000154
--	CHIMNEY WORKS	--		

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
1.0	Earth work in excavation in all types of soil including moorum, ash which can be excavated by any means including setting out, levelling, dewatering (but excluding special type of dewatering viz. well point method), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 500 m, spreading/levelling of disposed materials etc all complete for following depths below ground level including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge	--		
a	Depth from ground level but not exceeding 2 m	cum	100	.0000042
b	Depth exceeding 2 m but not exceeding 4 m	cum	100	.0000048
c	Depth exceeding 4 m but not exceeding 6 m	cum	100	.0000062
d	Depth exceeding 6 m but not exceeding 8 m	cum	100	.0000086
2.0	Extra over Item No. 1 for dewatering of ground water by well point method as per IS 9759.	cum	200	.0000341
7.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with selected materials from compulsorily excavated soil & ash available within a lead upto 500m and compacted as specified including re-excavation of stacked earth, watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	--		
a	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII)	cum	500	.0000295

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	500	.000028
c	Each layer compacted so as to achieve at least 85% maximum dry density as per IS-2720 (Part-VII)	cum	200	.0000109
8.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with selected materials directly from excavation and compacted as specified including watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	--		
a	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII)	cum	500	.0000234
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	100	.0000044
9.0	Extra over item No. 1 and 3 to 7 for carriage of excavated earth/selected materials for every 1 km or part thereof beyond an initial lead of 500m.	cum	100	.0000008
10.0	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with approved borrowed soil (borrowed soil/ morrum to be arranged by the bidder) and compacted as specified including supplying borrowed soil, royalty (if any), watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	--		
a	Each layer compacted so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII)	cum	1,800	.000819

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
b	Each layer compacted so as to achieve at least 90% maximum dry density as per IS-2720 (Part-VII)	cum	200	.0000904
c	Each layer compacted so as to achieve at least 85% maximum dry density as per IS-2720 (Part-VII)	cum	200	.0000901
11.0	Supplying and filling sand upto any depth below grade slab, around foundations, etc. in layers not exceeding 250 mm thickness and compacted so as to achieve at least 80% relative density as per IS-2720 (Part-XIV) including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any) etc. all complete including necessary men/women, materials, equipment, loading, transportation, unloading etc as per specification, drawing and as directed by engineer- in-charge.	cum	100	.0001145
12.0	Supplying and laying (inside chimney in the space below the grade level slab) crushed rock (63mm down graded) and sand fill in layers no more than 150 mm thick each and thoroughly compacted by compacting equipment and by water flooding to achieve maximum density for all leads and lifts including all labour, materials, equipment etc. complete as per drawings, specifications and directions of the Engineer.	cum	650	.0005168
13.0	Providing and laying Nominal Mix plain cement concrete (1:3:6) with graded aggregate (with maximum size of coarse aggregate not exceeding 40 mm) at all levels for all kinds of work like mass concrete, lean concrete, mudmat, filling etc. including labour, materials, equipment, handling, transporting, batching, curing, testing etc. all complete as per specifications, drawings and instructions of the Engineer.	cum	250	.0006814

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
14.0	Providing and laying design mix cement concrete with graded aggregate (maximum size of coarse aggregate not exceeding 20 mm) for reinforced concrete work at all levels for all kinds of work, including labour, materials, equipment, handling, transporting, batching, mixing, placing, levelling, compacting, curing, testing etc. and rendering or cleaning and finishing the exposed surface with cement mortar (1:3) to give smooth and even surface, all complete as per specifications, drawings and instructions of the Engineer, but excluding all formwork and reinforcing steel:	--		
i	For all works below ground level (except chimney shell)	--		
b	Grade M-30 (foundations, etc)	cum	100	.0003334
ia	Extra over St. No. 14(i) for controlling of temperature of fresh concrete for raft/pilecap to less than 23 degree centigrade using ice, including all related arrangements for providing, storing and mixing of ice with water, cooling of aggregates etc. All complete as per specification, drawing and instruction of engineer in charge.	CUM	100	.0000506
ii	For all other works	--		
a	Grade M-20 (grade level slab)	cum	120	.0003679
b	Grade M-30 for chimney shell, corbels and external platforms and other shell attachments.	cum	155	.0005156
c	Grade M-35 for chimney shell, corbels and external platforms and other shell attachments.	cum	200	.0006817
d	Grade M-25 for all other components of the super structure, roof slab, mini -shells, beams, columns wall etc.	cum	20	.0000649
15.0	Providing and applying two coats of bitumen grade 85/25 as per IS 702 (@ 1.7kg/sqm) with 1% antistripping compound conforming to IS 6241 in foundation, shell, pedestal etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete.	Sqm	10	.0000006

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
16.0	Transportation from BHEL stores and placing reinforcement, for reinforced concrete work, at all levels, for all kinds of work, including transportation, cleaning, derusting, straightening, cutting, bending, binding in position with annealed wire and/or welding, providing concrete cover blocks, pins, separators, chairs, supports for reinforcement, etc. with all materials, labour, equipment, handling, transporting, testing, etc. preparation of bar bending schedules, all complete as per specifications, drawings and instructions of the Engineer.	--		
i	For all works below ground level (except chimney shell)	--		
a	High strength deformed bars (Supply by BHEL at free of cost)	Mt	50	.0002952
16A	Providing and placing reinforcement, for reinforced concrete work, at all levels, for all kinds of work, including transportation, cleaning, derusting, straightening, cutting, bending, binding in position with annealed wire and/or welding, providing concrete cover blocks, pins, separators, chairs, supports for reinforcement, etc. with all materials, labour, equipment, handling, transporting, testing, etc. preparation of bar bending schedules, all complete as per specifications, drawings and instructions of the Engineer.	--		
ii	For all other works	--		
a	Mild steel reinforcement bars (Supply is in bidder's scope)	Mt	84.84	.0025591
16B	Transportation from BHEL stores and placing reinforcement, for reinforced concrete work, at all levels, for all kinds of work, including transportation, cleaning, derusting, straightening, cutting, bending, binding in position with annealed wire and/or welding, providing concrete cover blocks, pins, separators, chairs, supports for reinforcement, etc. with all materials, labour, equipment, handling, transporting, testing, etc. preparation of bar bending schedules, all complete as per specifications, drawings and instructions of the Engineer.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
b	High strength deformed bars (Supply by BHEL at free of cost)	Mt	200	.0011806
16 (a)	Extra over ST No.16 for providing fusion bonded epoxy coating by mechanised & qualified process including blast cleaning to white metal as per Swedish code, heating in induction heater, electrostatically spraying the epoxy powder, complete fusion to give minimum coating thickness of 200-300 microns, gradual cooling without affecting the properties of steel, testing as per ASTM 775 and IS:13620, flexibility & holiday test, proper packing, safe transportation, touchup at site, etc. complete to ensure proper resistance of FBE against corrosive environment including transport of the steel from BHEL site store to vendor plant and bringing back to site and special handling during straightening, cutting, bending, placing and providing PVC coating on binding wire.	--		
i	For all works below ground level (except chimney shell)	--		
a	High strength deformed bars	Mt	50	.0003137
ii	For all other works	--		
a	Mild steel reinforcement bars	Mt	84.84	.0005323
b	High strength deformed bars	Mt	200	.0012549
17.0	Providing and fixing formwork of approved quality for cast-in-situ, plain or reinforced concrete works of any type and section (including curved surfaces and chimney shell) for all elevations, including labour, materials, equipment, waste of forms, shoring, strutting, scaffolding, staging, tieing, nailing, caulking, bolting etc. and removal of form work and staging etc. all complete as per specifications, drawings and instructions of the Engineer.	--		
--	For all works below ground level (except chimney shell)	Sqm	500	.0001157
--	For all other works	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	Inner and outer faces of wind shield with slip form shuttering	Sqm	1,500	.0005155
b	All other components of the superstructure including slabs, beams, columns, walls, enclosures, mini shells, external platforms, corbels, other shell attachments, chases/recesses in shell etc.	Sqm	690.24	.0003523
18.0	Providing and fixing formwork in shell openings (above 0.1 sq.m surface area) including cutting, formation of shapes and all other operations required for making the required shape and size, removal of formwork, all complete as per specifications, drawings and instructions of the Engineer.	Sqm	50	.0000221
19.0	Providing and placing in position at all levels, building paper (kraft paper), as per IS:1397, between concrete surfaces including the cost of labour, material, etc. complete as per drawings and instruction of the Engineer.	Sqm	80	.0000095
20(A)	Supplying and installation of Dura board HD100 or its equivalent as approved by the Engineer, as filler material in joints including nailing, installation as per manufacturer's recommendation etc. all complete.	--		
a	12 mm wide joints. SQM	Sqm	40	.0000104
21.0	Providing and filling, at all levels, bitumen sealing compound (hot applied type) conforming to IS:1834, for sealing gaps and joints in concrete, including cleaning, mixing, heating, pouring or injecting, application of primer, cost of all labour, material and equipments etc., complete as per drawings, specifications and instructions of the Engineer.	Kg	605	.0000363
22.0	Preparing detailed fabrication drawings and after approval by the Engineer, supplying, fabricating, erecting and installing miscellaneous steel parts to be embedded/cast in concrete (like staircase embeddings, corbel face plates, etc) at all positions and levels including the cost of all labour, materials and equipments for setting materials in concrete, grouting, welding, bolts & bolting, expansion anchors, drilling, cutting, etc. complete as per drawings and specification.	Mt	2.16	.0001164

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
23.0	Preparing detailed fabrication drawings after approval by the Engineer, Transportation from BHEL stores, fabricating and erecting structural steel work for the stair case (from grade level to roof level), internal platforms, walkway gallery structures, chequered plate panels (for floors of internal and external platforms), treads and landings of the staircase including brackets, kick plates, structural members, beam support bearings on the shell, stiffeners, seats, blockouts, ready to bolt fixtures, cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, welding to cast in fixing place, cutting, grinding, drilling, bolts and bolting, anchor fasteners, welding, preheating and post heating for welding, testing, primer and finish painting etc. complete as per drawing and specifications. (Structural steel for staircase shall be provided by BHEL free of cost)	--		
23(i)	Preparing detail fabrication drawing & approval	MT	60.06	.0000722
23(ii)	Fit-up/Fabrication	MT	60.06	.0006501
23(iii)	Erection	MT	276.14	.0019263
23(iv)	Alignment & welding	MT	450	.0005412
23(v)	Painting	MT	255.72	.0009842
24 (a)	Supplying, fabrication, erection and alignment of factory made galvanised grating units with mild steel conforming to IS:2062 in platforms, staircases with edge binding strips and anti-skid nosing in treads etc. including including hot dip galvanisation as per IS:4759, fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete.	Mt	125	.0058795

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
25.0	Providing and fixing in positing of high strength structural bolts (of property class 8.8 and product grade 'C' as per IS: 1367) and conforming to IS: 3757 and high strength structural hardened and tempered nuts (of property class '8' as per IS:1367) conforming to IS:6623 with hardened and tempered washers as per IS:6649 etc. up to and inclusive of 39 mm diameter and upto 300 mm long for structural steel work etc all complete.	Quintal	42.96	.0003229
26.0	Transportation from BHEL stores, Preparing detailed fabrication drawings and after approval by the Engineer, fabricating and erecting, at all levels, structural steel flues (liners) ,(Structural steel sections to be used for flue shall be corrosion resistant steel type COR-TEN-B having an yield stress 250MPa conforming to IS 2062 (E250) of minimum thickness 10mm unless noted, complete with all bends, flanges, stiffeners, all other flue attachments, support system, collars, access manholes and gas sampling ports alongwith gaskets and other accessories, staying system, including the cost of all labour, material (except COR-TEN-B structural steel section) and equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drillings, bending, bolts and bolting, welding, preheating and post-heating for welding, testing, etc. complete as per drawings and specifications. (COR-TEN-B shall be supplied by BHEL free of cost)	Mt	1,275	.0245998
27.0	Providing, fabricating and installing at various locations and elevations of the chimney system the following miscellaneous mild steel items complete with the cost of all labour, material and equipment, transporting, lifting, setting in place, cutting, grinding, drilling, welding, bolts and bolting, anchor fasteners and anchoring, priming, painting, grouting etc. complete as per drawings and specifications:	--		
a	Mild steel ladders with cage, hood access hatch, louvers, bird screens, hood drain basin covers and other miscellaneous mild steel items not specifically mentioned.	Mt	17	.0008083
b	32/40 mm nominal bore medium class tubular hand railing for stair case and internal and external platforms.	Mt	41	.0018936
c	Providing minimum 275 gsm Hot dipped galvanisation on mild steel parts as per specification including supply of mild steel items.	Mt	5	.0002853

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
d	Providing Hot dipped galvanisation on mild steel parts as per specification/IS: 4759 including supply of mild steel items.	Mt	55	.0031384
28.0	Preparing detailed fabrication drawings after approval by the Engineer, providing, fabricating and erecting, at all levels, mild steel strakes complete with all stiffeners, attachments, fasteners, pipe sleeves, etc. including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, embedding components in concrete, fixing to cast-in embedments, cutting, grinding, drilling, bolts and bolting, welding, preheating and post heating for welding , testing, grouting, primer and finish painting of exposed components, etc. complete as per drawing and specifications.	Mt	25	.0011659
29.0	Supplying, fabricating and installing in the liners, gas sampling and gas opacity measurement ports made from SS grade 316L pipe including the cost of all labour, materials, bolts and bolting, asbestos gaskets, cover plates & all other accessories, painting etc., complete as per drawings and specifications.	Each	10	.0009547
30.0	Preparing detailed fabrication drawings after approval by the Engineer, erecting, at all levels SS Mini Shell at roof shell of grade A316L , etc. complete as per drawing and specifications. (Supply by BHEL free of cost)	--		
30 (a)	Fabrication	Mt	11.89	.0006883
30 (b)	Erection	Mt	32	.001235
31.0	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and installing at all levels, stainless plates (including stainless steel screws and fasteners) of grade AISI 316L and lead sheets beams and over the mild steel in the platform beam bearing, flue supports bearings, flue restraints brackets/ buffers etc. including the cost of all labour material & equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drilling, welding of stainless steel using compatible & approved stainless steel electrodes, testing & machining flat and polishing the contact surfaces of stainless steel, coating the polished surfaces with silicone grease, etc., complete as per drawings and specifications.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a	Stainless steel components.	Mt	0.24	.000069
b	Lead Sheets.	Kg	80	.0000354
32.0	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and installing expansion compensator joints including bolster in the flue liner including all labour, material and equipment transporting, hoisting, fixing in position, drilling, cutting, bolts and bolting, etc. along with the user handbooks (giving details of installation, dismantling and maintainance procedures for the expansion joints), testing, etc complete as per drawings and specifications.	Sqm	160	.0015622
33.0	Supplying ,Fabricated Ready to Install, spare expansion compensators alongwith bolster including the cost of all labour, material and equipment, accessories, transporting, proper packaging (for several years of storage), and delivery to site store complete in all respects as per drawings and specification.	Sqm	45	.0004394
34.0	Supplying and laying in position shaped acid resisting bricks conforming to class - I of IS:4860 at all elevations for liner, baffle wall construction (with sloped A/R mortar toppings over brick work) complete including the cost,of all labour, material and equipment, raking joints, flush pointing, cleaning, curing, etc. complete as per drawings and specifications.	Cum	25	.00063
35.0	Supplying and laying in position shaped fire bricks conforming to IS-6 group A at all elevations for liner, baffle wall construction (with sloped A/R mortar toppings over brick work) complete including the cost,of all labour, material and equipment, raking joints, flush pointing, cleaning, curing, etc. complete as per drawings and specifications.	Cum	25	.0006555

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
37 (a)	<p>Supplying, and placing in position Load bearing insulation assembly including (i) a properly machined mild steel plate with recess at its top for seating PTFE (Poly Tetra Fluoro Ethylene) sheets conforming to BS:5400 (ii) saddle plate (MS) in the middle having stainless steel plate fixed at its bottom surface and lead / elastomeric sheet at top, and (iii) top late formed of two numbers insulation blocks each made of minimum 50 mm thick rigid, non-combustible asbestos fibre reinforced lime-silica board (SINDANYO BLOCKS NATURAL GRADE CS-51) or equivalent bonded to mild steel plates at top and bottom. For side restraints assembly of insulation blocks of SINDANYO Natural Grade CS-51 or equivalent and stainless steel plate shall be used. All stainless steel in these assemblies shall conform to AISI-316L and mild steel to IS:2062. SINDANYO BLOCKS or equivalent shall be suitable for operation at 320oC and shall primarily satisfy the following physical properties:</p> <p>i) Minimum compressive stress prior to onset of compression yield of not less than 12 N/sq.mm.</p> <p>ii) Minimum shear strength of 30 N/sq.mm when tested in accordance with BS:3497-1979.</p> <p>iii) Thermal conductivity shall not exceed 0.67 W/m Deg.C at a mean temperature of 200oC and its coeff. of linear expansion not to exceed 1.2x10-5 per Deg.C.</p> <p>iv) Adhesive used for bonding purposes shall be of material with equivalent high temperature properties as approved Foundation Engineer. It may be of Fortafix</p>	Nos.	64	.0021172
38.0	Supplying and laying vermiculite concrete in the liner basin including the cost of all labour, material and equipment for handling, transporting, mixing, lifting, placing, curing, finishing of surface etc. complete as per drawings and specifications.	Cum	5	.0001089
42.0	Supplying and installing ready mix castable refractory concrete at opening of chimney shell baffle wall and at other locations including all necessary arrangement for keeping them in position as per drawings and approval of Engineer.	Cum	5	.0000919

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
44.0	Providing, fabricating and laying in position asbestos mill boards, over the mini shells below the cast iron cap segments, in between the cap segments and wherever as directed by the engineer, including the cost of all labours, material and equipment, cutting, drilling, etc., complete as per drawings and specifications.	--		
a	25 mm thick asbestos mill boards.	Sqm	15	.000015
46.0	Providing and installing, at all levels, resin bonded glass wool insulation slabs of density not less than 64 kg/m ³ with an installed thickness of not less than 100 mm, on the outside surface of steel flue liners, on the outside surface of brick liner, on the inside surface of concrete windshield, inside surface of concrete minishells, under the cast iron caps and wherever as directed by the Engineer, in two layers (each 50 mm thick) including the cost of all labour, material and equipment, transporting, lifting to all heights, etc., inclusive of plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc. welding of pins/studs to steel surfaces or embedding of pins/studs/anchors in concrete surfaces, fixing, cutting, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Sqm	4,050	.0015912
46 (a)	Providing and installing, at all levels, resin bonded glass wool insulation slabs of density not less than 64 kg/m ³ with an installed thickness of not less than 50 mm, on the outside surface of steel flue liners, on the outside surface of brick liner, on the inside surface of concrete windshield, inside surface of concrete minishells, under the cast iron caps and wherever as directed by the Engineer, in two layers (each 25 mm thick) including the cost of all labour, material and equipment, transporting, lifting to all heights, etc., inclusive of plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc. welding of pins/studs to steel surfaces or embedding of pins/studs/anchors in concrete surfaces, fixing, cutting, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Sqm	2,030	.0005056

Part C : Bill of Quantities

Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
47.0	Providing and installing, at all levels, resin bonded rock wool insulation slabs of density not less than 100 kg/cu.m with an installed thickness of not less than 100 mm, on the outside surface of steel flue liners, on the outside surface of brick liner, on the inside surface of concrete windshield, inside surface of concrete minishells, under the cast iron caps and wherever as directed by the Engineer, in two layers (each 50 mm thick) including the cost of all labour, material and equipment, transporting, lifting to all heights, etc., inclusive of plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc. welding of pins/studs to steel surfaces or embedding of pins/studs/anchors in concrete surfaces, fixing, cutting, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Sqm	4,050	.0017379
47 (a)	Providing and installing, at all levels, resin bonded rock wool insulation slabs of density not less than 100 kg/cu.m with an installed thickness of not less than 50 mm, on the outside surface of steel flue liners, on the outside surface of brick liner, on the inside surface of concrete windshield, inside surface of concrete minishells, under the cast iron caps and wherever as directed by the Engineer, in two layers (each 25 mm thick) including the cost of all labour, material and equipment, transporting, lifting to all heights, etc., inclusive of plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc. welding of pins/studs to steel surfaces or embedding of pins/studs/anchors in concrete surfaces, fixing, cutting, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Sqm	2,030	.0005368

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
47 (c)	Providing and installing, for the exposed portion of flue at the top, the insulation material, having a minimum density of 200 kg/cum, consisting of 6 layers of insulation material each of a minimum thickness of 25 mm and all joints shall be staggered, wherever as directed by the Engineer, including the cost of all labour, material and equipment, transporting, lifting to all heights, etc., inclusive of plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc. welding of pins/studs to steel surfaces or embedding of pins/studs/anchors in concrete surfaces, fixing, cutting, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Sqm	500	.00036
48.0	Providing and packing, at all levels, loose glass wool insulation to a density not less than 64 kg/m ³ between the insulated minishells and brick liners at expan joints between the lining segments and wherever as directed by the Engineer including the cost of all labour, material and equipment, filling, ramming, testing, etc. complete as per drawings and specifications.	Cum	5	.0000249
49.0	Providing and packing, at all levels, loose rock wool insulation to a density not less than 100 kg/cu.m between the insulated minishells and brick liners at expanjoints between the lining segments and wherever as directed by the Engineer including the cost of all labour, material and equipment, filling, ramming, testing, etc. complete as per drawings and specifications.	Cum	5	.0000282
50.0	Providing and painting, at all levels, inside surface of chimney shell, inside and outside surfaces of minishells, underside of roof slab and other concrete components/surfaces of the chimney as indicated in the drawings and wherever as directed by the Engineer, with acid and heat resisting black bituminous paint (conforming to type I(i) of IS:158) in as many number of coats (not less than four coats in any case) as required to give a paint DFT of not less than 150 microns including the cost of all labour, materials, equipment, surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specifications.	Sqm	19,250	.0024857

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Tender Specification BHEL:PSSR:SCT:1979_PART_A Rev 1 for Balance works for Civil, Structural and Architectural works of various buildings/structures including Ground improvement works (Inside plant boundary) and Balance works for construction of RCC Chimney

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
53.0	Providing and painting, at all levels, the external surfaces of chimney shell and wherever as directed by the Engineer, with synthetic enamel paint in alternate bands of colours 'signal red' and 'pure/bright white including the cost of all labours, material and & equipment, surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specification.	Sqm	16,450	.0021031
54.0	Providing and painting, at all levels, the external surfaces of chimney shell and wherever as directed by the Engineer, with acid and heat resistant polyurethane paint in alternate bands of colours 'signal red' and 'pure/bright white including the cost of all labours, material and & equipment surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specification.	Sqm	3,750	.0008059
55.0	Proving and laying over the chimney roof, a comosite acid and heat protection treatment including providing of slopes for roof drainage including the cost of all labour, material and equipment, etc., complete as required for preparing the roof concrete, laying under bed of plain cement concrete screed to slopes, preparation of screed surface for painting, painting the screed surface with black bituminous paint, applying bitumenmastic in layers, laying acid resisting(A/R) mortar bed and laying 75 mm thick acid resisting(A/R) bricks with A/R mortar, curing, pointing (with phenolic based A/R cement), protection and cleaning, finishing, etc., complete as per drawing and specifications.	Sqm	270	.0003894
56.0	Providing, fitting & fixing, outlet and overflow, cast iron roof drain heads (with gratings) in chimney roof including sockets, adapters, brackets, hangers, supports, etc., casting-in and jointing to 150 mm nominal bore rainwater pipes, grouting, etc. including the cost of all labour material and equipment, transporting, lifting, setting in place, painting, etc. complete as per drawing and specifications.	Each	8	.0004022

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
57.0	Providing, fitting and fixing rainwater pipes at all levels internally from the chimney roof to ground level upto the hood drain basin including shoes, bends, junctions, flanges, hoppers, sockets, adaptors, brackets, hangers, supports, anchor fasteners, spacers, pipe sleeve through shell, silicon or vulcanised butyl sealant, foam backing material, jointing, socketing, grouting, caulking, primer and finish painting etc. complete including the cost of all labour, material and equipment, complete as per drawing and specifications:	--		
a	150 mm nominal bore cast iron pipes.	Rm	25	.00004
b	150 mm nominal bore medium class galvanised mild steel pipes.	Rm	550	.0004972
c	150 mm nominal bore UPVC.	Rm	25	.0000085
58.0	Providing and laying 50 mm thick cement concrete flooring (comprising of 12 mm thick non-metalllic concrete hardener topping over 38 mm thick under bed of concrete) over the grade level slab inside the chimney, including the cost of all labour, material and equipment, etc. complete as required for preparation of base, laying underbed and topping, finishing, rounding of edges, corners and junctions, curing, testing, etc. complete as per drawing and specifications.	Sqm	790	.000212
59.0	Providing and installing an electrically operated grill type steel roll-up door (with the bottom 0.5 metres of the curtain in solid type) at chimney base, in opening of size 7.8 m by 7.1 m, with all hardware and mechanisms, fittings and fixtures, locking arrangements, frames, fasteners, gear handle arrangement for standby manual operation, all electrical accessories such as motors, control systems, cables, etc. including the cost of all labour, material and equipment, fixing in position, grouting primer and finish painting, testing, etc., complete as per drawing and specifications.	Each	1	.0002674

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at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
60.0	Providing and installing at any level and location, mild steel, double plate, personnel access doors, in shell openings of size 1.1m by 2.15m, complete with all fittings and fixtures, locking arrangements, frames, fasteners including the cost all labour, material and equipment, lifting to all heights, setting in place, grouting primer and finish painting, etc., complete as per drawing and specifications.	Each	7	.0000878
61.0	Supply, fabricating and fixing of cleanout door of size 650X825 mm. The door should be solid steel construction with inner plate 8mm and outer plate 6mm with suitable infill of stiffeners, & filled with insulation material and all other fittings, fixtures, fasteners including the cost of painting etc complete as per drawings and specification. The door should be hinged type and providing with locking device in addition to swivel studs with wing nuts on remaining 3 edges. The door should be openable both from inside & outside and removable insulation to be provided around door opening. The door shall be provided with a minimum two coats of acid & alkali resistant paint confirming to IS158 type-I to give a DFT of 75microns. The outside surface shall be provided with minimum 2 coats of Zinc redoxide primer and two coats of synthetic enamil paint.	Each	2	.0000073
63.0	Supplying, fabricating and installing mild steel/Stainless steel hatches at various locations in the chimney system complete with locking arrangements, frames, insulation, fittings and fixtures and all mechanisms and accessories reqd. for proper operation including all labour, painting etc. complete as per drawings and specifications.	--		
a	Hood Access Hatch	Each	1	.0000143
c	Liner Access Hatch	Each	2	.0000237
64.0	Conducting load testing on girders for 1.25 times the full load, on ground , including provision of test bed and jacks, dial gauges and other supplies complete as per specification and drawings and approval of engineer in-charge.	Pair	2	.0003402

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
65.0	Designing, supplying, fabricating and installing after approval by the Engineer, non-metallic expansion joints to seal gaps between chimney components and to meet the service requirements as given in the specifications alongwith the cost of all components of the expansion joint, insulation, galvanised bolts, nuts, washers, anchor fasteners and retaining bars, packing materials and reinforcements at the connecting ends and flanges, lapping etc. including preparation of brick surface (to be connected to the expansion joint) with potassium silicate resisting mortar for proper leak tight bearing surface, with the cost of all labour and equipment, user hand books (giving details of installation, dismantling and maintenance procedures for the expansion joints) etc. complete as per drawings and specifications for:	--		
a	Expansion joint between ducts and liners.(2 Nos.)	Sqm	20	.0001588
66.0	Designing, supplying and erecting after approval by Engineer an Elevator from ground upto top of chimney with landing at various platform level complete as per spec. and approved drawings.	Lumpsum	1	.002458
--	ELECTRICAL ITEM FOR THE BOQ:(The scope covers Design, procurement, installation , commissioning & testing for the same)	--		
E1	415V, 200A, 50 KA for 0.25 sec, 4 wire AC Distribution Board with 1No. incomer (SFU) & 9 nos. of 100A (TPN) outgoing complete in all respects	No.	1	.0000804
E2	415V, 200A, 4 wire AC Emergency Lighting distribution board alongwith 50KVA lighting transformer (415/433 V, Dyn11, Z=4%, +/- 2x2.5% Off Ckt. Tap) with 2 nos. of incomers with auto changeover facility using contacts and 6 nos. 100A SFU (TPN) outgoings complete in all respectsIn case load requirement of chimney can not be met by 50 kVA lighting transformer after considering loading of 80 to 85%, 100 kVA lighting transformer shall be provided alongwith suitably rated components without any commercial implications to the purchaser.	No.	1	.000223
E3	Normal AC lighting panel outdoor type with degree of protection IP 65 with one no. 100A SFU (TPN) Incomer , 18 outgoing (16A SP MCBS)	No.	3	.000135

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
E4	Emergency lighting panel outdoor type with degree of protection IP 65 with One no. of 100A TPN/SFU incomer and 12 outgoings (16A, SP MCBs)	No.	3	.000135
E5	Aviation lighting panel outdoor type with degree of protection IP 65 with one no. 100A SFU (TPN) Incomer , 8 outgoing 32A SFU (TPN), photodetector and timer circuit along with 100A contactor to control aviation lighting system.	No.	1	.0000483
E6	Aviation obstruction lights :	--		
a)	GEC Cat. No. ZA750(L) NEON WITH minimum 20 years maintenance free life.(Low intensity (Multi LED type- B as per ICAO)	No.	16	.0001401
b)	Medium intensity flashing RED light as per ICAO standard having intensity of 2000 to 20,000 candles depending upon background illuminance & flashing frequency 40-60/min with all accessories WITH minimum 20 years maintenance free life (Medium intensity Multi LED type- B as per ICAO)	No.	12	.0005401
E7	Aviation Distribution Board (ADB) with one 32A SFU (TPN) incomer and 8 nos. SP 20A MCB. Construction is same as Lighting Panel.	Each	3	.0000684
E8	250W metal halide Flood lights with fixtures, lamps and all control gears & accessories	No.	48	.000203
E9	Metal halide Well glass type luminaries with 70W lamp with all controlgears & accessories(Metal Halide fixtures)	No.	110	.0003909
E10	Metal halide Well glass type luminaries with 150W lamp with all controlgears & accessories. (Metal Halide fixtures)	No.	50	.0001139
E11	63Amp welding switch socket with plug & other Mounting accessories	No.	8	.0000542
E12	3 pin, 1 ph, 240V,15Amp. Power socketscomplete with plug Switches etc.	No.	8	.0000231
E13	AL conductor, XLPE insulated, Armoured, ST-2 outer sheath, FRLS type 1100V grade conforming to IS-7098 Part I.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
a.	3 1/2 C x95mm ² Al for connection between ACDB/ELDB/ welding sockets	RM	1,400	.0005748
b.	3 1/2 Cx35mm ² Al for Lighting panel incoming supply	RM	1,000	.0001903
c.	4C x16mm ² Al Conductor, XLPE insulated, Armoured, PVC outer sheath, FRLS type 1100V grade conforming to IS-7098 Part I for connection between ALP/ADB/Aviation Lights	RM	1,600	.0001945
E14	PVC insulated 1100V grade stranded Cu Conductor lighting wires conforming to IS-694 for the following.	--		
a)	2.5 mm ²	RM	3,000	.0000768
b)	4.0 mm ²	RM	9,000	.0003137
E15	GI pipe conduit with minimum 25 mm dia with GI junction boxes, GI pull boxes & accessories etc. complete in all respects.	RM	7,000	.0007799
E16	PVC coated Flexible steel conduit 25mm dia with accessories	RM	500	.0000235
E17	Lightning protection Air terminal : Lead coated copper material of 20mm dia & 2 metre long each.	RM	25	.000173
E18	Electrical equipment earthing materials including down conductors	--		
a)	Below ground earthing system	RM	150	.0001142
b)	Above ground earthing system	RM	1,500	.0010431
E19	16 SWG GI wire for equipment earthing	RM	100	.0000019
E20	Test links for down conductors	nos.	4	.0000039

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
E21	Earthpit with earthing electrode including brick chamber with cover, accessories etc. complete in all respect.	nos.	4	.0000247
E22	Telephone socket with junction box etc. complete as per drawings & specifications.	Each	10	.0000065
E23	Telephone handsets complete as per drawings & specifications.	Each	10	.0000048
E24	Telephone cable (minimum 4 pair) of minimum 0.6 mm dia annealed high conductivity electro copper conductor, PVC insulated, twisted, PVC tape wrapped, screened, tip corded, PVC sheathed, confirming to relevant ITD (Indian Telephones department) specification	--		
a)	24 pairs	RM	150	.0000804
b)	4 pairs	RM	300	.0000141
E25	GS cable trays. Cable trays shall be of ladder type constructed of minimum 2 mm thick mild steel hot dip galvanise including cover, cabling material, accessories etc. complete as per drawings & specifications.	--		
a	600 mm wide	RM	150	.00019
b	300 mm wide	RM	150	.0001418
c	150 mm wide	RM	100	.0000634
Note :	1. Ambient temperature for design of all electrical equipment shall be considered as 55 deg C for chimney electrical system. 2. Schedule of Equipment has been indicated for reference only. All electrical items shall be supplied on as required basis. 3. All cable termination shall be with required Cable glands & lugs for complete electrical systems of Chimney.	--		

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
TOTAL Weightage				0.9999999

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Tender Specification BHEL:PSSR:SCT:1979_PART_B Rev 1 for Providing, installing and handing over of two covered coal sheds including Design, supply, fabrication, welding, handling, assembling & erection

at 2 X 660 MW Ennore SEZ Supercritical Thermal Power Project at Ash Dyke of NCTPS

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
ITEM NO: 1	<p>Total price for 'Engineering, Procurement, Supply and Construction of 2 no.s structural Covered sheds for Coal stock piles for 2X660 MW ENNORE SEZ STPP, AT ASH DYKE OF NCTPS, CHENNAI' as per Scope of work & technical specification (The Supplier for Covered shed shall be approved by Customer/BHEL) (Supply of sheeting material and steel structure in vendor scope). Transit insurance as well as insurance for material at site for erection and commisioning is in bidder's scope.</p> <p>Payment shall be made as per below provided breakup on prorata basis:</p> <p>1 a) Approval of DBR (Design Basis Report) & on certification by BHEL- 1% 1 b) Preparation, finalization & approval of design, drawing & QAP and on certification by BHEL - 1% 1 c) Third party inspection, issuance of MDCC and submission of dispatch document and document for transit insurance- 60% 1 d) Receipt of material at site and production of Material receipt Certificate MRC - 10% 1 e) Storage of material and Preservation of material supplied (as applicable) and utilization in erection - 3% on start of erection 1 f) Erection of supplied materials inlcuding finishing works and painting and duly certified by BHEL /TANGEDCO - 24% 1 g) Handing over the sheds as certified by BHEL Engineer - 1%</p>	LS	2	1
TOTAL Weightage			1.0	