BHARAT HEAVY ELECTRICALS LIMITED

PROJECT ENGINEERING MANAGEMENT
NOIDA

TECHNICAL SPECIFICATIONS FOR "ENGAGEMENT OF A CONSULTANCY FIRM FOR QUANTITY SURVEYOR SERVICES"

BHARAT HEAVY ELECTRICALS LIMITED
Project Engineering Management
BHEL SADAN
Plot No. 25, Sector 16A
NOIDA, U.P. – 201301

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1.0	**Project Information:**
1.1	BHARAT HEAVY ELECTRICALS LIMITED (BHEL) – A Maharatna company is a government of India undertaking. BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing company of its kind in India engaged in the design, engineering, manufacturing, construction, testing, erection and commissioning of power plants in the country and abroad.
1.2	Intent of this tender is to engage a consultant for providing Quantity Surveyor (QS) Services for the project of 2 X 800 MW LARA STPP STAGE II, District- Raigarh, Chhattisgarh.

2.0	**Scope of Works:** Scope of the works/Services for the Quantity Surveyor (QS) under Civil, Structural and Architectural Works shall be as per following:
2.1	Quantity take off from engineering drawings for all Items of Bill of Quantity (BOQ), such as Earth work in excavation, back filling, concreting (PCC and RCC of different grades), structural steel, reinforcement, formworks, masonry works, plastering, finishing work etc. Computation of quantities of all bought out items i.e. water proofing materials, joints and fillers, embedment, foundation bolts, grouting material, doors and windows, glazing, aluminium works, ACP Panels, steels doors, fire doors, shutters, paints, tiles and flooring materials, deck sheets, cladding sheets, false ceiling, rain water down take-pipes, fencing and MS gates, Water Supply and Sanitary Fittings/ Fixtures, Structural steels Items (i.e. Gratings, Hand- Rails, Chequered Plates, MS Rods and Flats, Sluice Gates and Trash Screens) etc. Compilation of Building / Structure wise detailed quantity of these civil, structural and architectural works items. All items of BOQ shall be calculated by standard/established method accepted by BHEL. The sample format of BOQ is attached as **Annexure-A.** The items indicated in Annexure-A is for guidance only, actual details of items shall be furnished to qualified bidder after award of work.
2.2	Review of BBS (Bar Bending Schedule) based on drawing issued to Quantity Surveyor. Modification in BBS based on site feedback due to non-availability of any material or change in drawing due to site /engineering issues.
2.3	Review of structural Cutting Plan for minimising the wastage/ scrap to furnish the details to fabricator.
2.4	**Data keeping** of scrap steel generated from works in consultation with project site. Format shall be shared to the successful bidder after award of work.
2.5	Up-to -date data recording of **Drawing vs Executed** quantities and furnishing the report on monthly basis.
2.6	Report generation for utilisation of steel out of scrap / offcut material which will be generated from fabrication works and also keeping the record of such good steel for utilisation in project in

	consultation with project site. Format shall be shared by project site to the successful bidder after award of work.
2.7	Calculation of quantities of RCC, reinforcement and structural steel from engineering drawings for inclusion in drawings including making records in compiled manner for RCC by grade wise, reinforcement by grade & diameter wise, structural steel by section wise for each building/ structure.
2.8	Quantity calculated by QS shall be submitted to BHEL for review. However, the quantity surveyor shall be completely responsible for accuracy of quantity calculated and data generated
2.9	The QS has to work out the quantities from drawings in compliance of prevailing IS codes/BHEL Specifications/Customer Specifications. QS has to work responsibly and should bring in cognizance of BHEL Engineer the quantity deviations (if any) w.r.to the original contracted BOQs before actual execution of respective works at site.
2.10	The QS shall submit all reports in the format as desired by BHEL. It may be in MS Excel/ MS Word format or directly in BHEL Portal/ web site. QS may be asked to submit any report in hard print. Printer and stationary shall be provided in respective offices by BHEL.
2.11	**Documentations & record keeping: -** The QS shall be responsible for maintaining documentations as per BHEL requirement in approved formats / systems for all the works in his scope and same shall be readily available to BHEL's Engineer as and when required. All documents shall be maintained in BHEL's computers and filing system. No documents shall be allowed to be disclosed or distributed outside BHEL without prior permission. Documentation includes following: - a) Master List of Bill of Material (BOMs) as per drawings. b) Monthly Reconciliation Statements (Package/structure wise and Cumulative). c) Deviation Statements (Package/structure wise and Cumulative). d) Drawings and Specifications e) Method Statements f) Minutes of Meeting g) Other Documents (Email Conversations etc.)
2.12	Quantity Surveyor shall interact with BHEL PROJECT Site /BHEL PEM NOIDA/BHEL ISG BANGALORE Officials and other BHEL Departments (if required) during course of work. They shall keep the BHEL ENGINEER appraised of all such discussions/ interactions on daily basis and shall keep all records of discussion.

Important Notes:

- The Successful Bidder shall finalise a DELIVERABLE & KPIs PLAN based on above scope of work with BHEL within 15 days from the date of LOI. The DELIVERABLE & KEY PLAN shall be subjected to BHEL's approval. The DELIVERABLE & KPIs PLAN shall be reviewed and revised on monthly basis by BHEL/ Successful Bidder.
- Quantity Surveyors shall complete the task within schedule date as per agreed KPIs/ Deliverable.
- BHEL shall review the performance of Successful Bidder on half yearly basis based on the completion of task as per KPIs reflecting on agreed deliverables.

3.0	**Buildings/ Structures/ Utilities:** The list of buildings/ structures/utilities in scope of work shall be as below, however this list is not exhaustive and is for guidance purpose only.
3.1	**Main Plant Buildings and Structures:** • Turbine Building, TG & AUX Building/ Service Building, • Boiler foundations, • ESP foundations, • Equipment and Machine foundations, • Coal Mill foundations and super structures, • Transformer yard, • Misc. foundations, pavements etc.
3.2	**Auxiliary Buildings:** • Cooling Water Pump House • Raw Water Pump House • CW Duct • ESP Control Room • Chlorination Plant Building • Compressor House • DG Building • Clarified Water Pump House Sump • Filtered Water Pump House • DM Make up Pump House • Auditorium, canteen, IT building • Administrative Building etc.
3.3	**Civil Works for BOP Packages:** • Ash Handling Plant • Coal Handling Plant • Pre-Treatment Plant • DM Water Treatment Plant • Effluent Treatment Plant Building • Cooling Towers, and Chimney etc. • Pipe Rack • Sewage Treatment Plant • Bio mass handling etc.
3.4	**Civil Works for FGD package:** • FGD control room building • Ball Mill Building • Gypsum Dewatering Building • Absorber foundation • Booster fan foundation • LHP, GHP etc. • Duct foundation

	• Miscellaneous tank and pump foundations etc.
3.5	**Infrastructure Works:** • Levelling and grading works • Road & drains and culverts • Storm water drains, Plant drains • Sewerage network etc.

4.0 Deployment of Quantity Surveyors: Details of deployment of number of Quantity Surveyors (QS) at respective locations with their major responsibilities is as given below: -

Sl. No.	Description	Major Responsibilities	Quantity (Nos.)	Location of Posting
1	QS-1	Planning & coordination, Quantity take off from engineering drawings for all Items of BOQ, Structural cutting plan, review of Bar Bending Schedule (BBS), optimization of quantities to minimize the wastage/ scrap, preparation of reports, documentation & record keeping as per detailed scope mentioned in clause 2.0 .	4	BHEL PROJECT SITE OFFICE, LARA, District-RAIGARH CHHATTISGARH
2	QS-2	Calculation of quantities of RCC, reinforcement and structural steel from engineering drawings for inclusion in drawings, preparation of reports, documentation & record keeping as per detailed scope mentioned in clause 2.0 .	1	BHEL PEM, NOIDA, UP
3	QS-3	Calculation of quantities of RCC, reinforcement and structural steel from engineering drawings for inclusion in drawings, preparation of reports, documentation & record keeping as per detailed scope mentioned in clause 2.0 .	1	BHEL ISG BANGALORE, KARNATAKA

5.0	**Qualification and Experience of Quantity Surveyors (QS):**
5.1	Quantity Surveyors having required **competencies and skill-sets** as mentioned below are to be deployed: - Quantity Surveyor should have **Diploma in Civil Engineering** or **B.Sc Degree in Quantity Surveying or B.E./ B. Tech. / B. Sc. Engineering in Civil Engineering** from an AICTE approved recognized Institute/ University/ College having minimum working experience of 3 years as Quantity Surveyor in

	civil/structural works and shall have working experience in basic computer software like MS office, AutoCAD etc.
5.2	In addition, the QS should have following soft skill sets too: - • Good communication skills. • Keen judgment and decision-making ability. • Use of critical thinking, logic, and reasoning. • Ability to collaborate as part of a high-performing team. • Meticulous attention to detail and accuracy of work. • Possess a strong work ethic, good organizational skills and can meet strict deadlines within a fast-paced working environment
5.4	The CVs of all QS along with copy of proof of identity, address, academic and professional qualifications and experience of each QS shall be submitted to BHEL by the Successful Bidder before deployment of QS with a covering letter from the Successful Bidder certifying that all the QS to be deployed are having the desired qualification and experience and all supporting documents are verified by the Successful Bidder at no additional cost to BHEL. Approval or rejection of the QS shall be sole discretion of BHEL and shall be binding on the Successful bidder. In case of rejection of any QS by BHEL, Successful bidder shall submit the details of alternate QS without any delay and no claim for compensation / time extension in this regard will be entertained.

6.0	**Miscellaneous Terms & Conditions:**
6.1	All data/findings obtained from this work shall be the property of BHEL. This cannot be published/utilized by Successful bidder or their representative without written permission of competent authority of BHEL.
6.2	Quantity Surveyor personnel shall keep all business and technical information/procedures received from the other party in connection with this agreement **confidential** and treat it with the same degree of care as their own similar trade or business secrets and not make it available to third parties, unless permitted in writing by competent authority of BHEL.
6.3	Quantity Surveyor shall be fully responsible for the tasks allotted to/ undertaken by them, authenticity of the reports/results etc. They shall prepare documents, witness/ undertake assessments and submit the documents/ reports to BHEL in time without hindrance of work.
6.4	Reasonable office space with furniture, computer infrastructure with internet, drawings, printer (on sharing basis) for proper functioning of the Successful bidder's Quantity Surveyor will be provided by BHEL free of charges. Other infrastructure facilities such as training room, projector, video conferencing, audio visual system etc. will be provided by BHEL free of cost, as per availability at BHEL PROJECT Site /BHEL PEM NOIDA/BHEL ISG BANGALORE.

6.5	Bachelor Accommodation for the QS Personnel posted at project site shall be provided by BHEL free of cost. However, no accommodation shall be provided to QS personals posted at BHEL PEM NOIDA and BHEL ISG Bangalore offices.
6.6	Successful bidder shall ensure the personal safety of QS deployed. The necessary Personal Protective Equipment (PPE) like helmet, safety shoes etc. shall be provided to QS by the successful bidder with no extra claim to BHEL at the project site. In case of any accident/ personal injury to any QS, BHELshall not be responsible.
6.7	It is the responsibility of the successful bidder **to arrange gate passes** for all his employees etc. for entering the project/office premises (wherever required). The medical test for QS personnel required for making gate pass at project site shall be arranged by successful bidder with no extra claim. Necessary help shall be provided by BHEL in arranging gate pass.
6.8	Each man day shall consist of 08 (eight hours) working hours excluding lunch break. However, working hours and timing as per BHEL PROJECT Site /BHEL PEM NOIDA/BHEL ISG BANGALORE practice must be followed by Quantity Surveyors. QS shall strictly follow the working hours with office / site timings. In case late entry and early exit, pro rata deduction will be made from the monthly bill. BHEL holidays at respective location shall be applicable to the Quantity Surveyors. However, Successful Bidder shall be liable to fulfil its commitment towards KPIs/ Deliverables.
6.9	In case of replacement of any QS either by resignation or termination or during long leave, a new QS has to be made available at least 5 days prior to withdrawing the existing QS. Full knowledge transfer has to be done by the existing QS to the new QS during the 5 days overlapping period.
6.10	BHEL PROJECT Site /BHEL PEM NOIDA/BHEL ISG BANGALORE may also follow Shift working to meet the requirements of project, hence BHEL reserve the rights to depute Quantity Surveyor during any shift in a day.
6.11	In case the performance of any Quantity Surveyor found to be unsatisfactory, his services shall be discontinued by BHEL and no payment shall be made against deployment of such unacceptable Quantity Surveyor, from the date Quantity Surveyor has been notified as unsatisfactory (in writing). Replacement of Quantity Surveyor will have to be arranged by the successful bidder within 15 days without any additional cost to BHEL for this arrangement. BHEL reserves the right to terminate the contract, short close the contract, demand for replacement, in case Quantity Surveyor performance is not satisfactory without mentioning any specific reason.
6.12	If due to negligence and/ or non-observance of safety and other precautions by Quantity Surveyor, any accident/ injury occurs to any other person(s)/ public, the successful bidder shall bear compensation and other liabilities as decided by appropriate authority/ BHEL/ Customer.
6.13	Successful bidder shall provide written assurance towards data privacy or place its IT server at site for all activities, including but not limited to, data collection, storage, analysis and reporting purpose.
6.14	In case the location of offices of BHEL viz PEM Noida and ISG Bangalore change in future, the deployment of QS personnel as mentioned in clause 4.0 will be changed accordingly with no extra claim by successful bidder.

7.0	**Contract Period and Mobilization:**
7.1	**Contract Period: -** The period of contract shall be for 24 **months** from the date of actual deployment of QS. Based on requirement of BHEL PROJECT Site/BHEL PEM NOIDA/BHEL ISG BANGALORE, this contract may be extended further up to **12 months** on same rate and same terms and conditions**.**
7.2	**Mobilization: -** After issuance of LOI, BHEL shall provide written intimation to the successful bidder for mobilization of required number of Quantity Surveyor at respective locations depending upon work availability and site readiness. On receipt of such written intimation from BHEL, successful bidder shall submit, within 7 days, CVs of all proposed Quantity Surveyors along with all other documents as required in clauses 5.4 & 6.13 for review and clearance by BHEL. Further, on getting clearance from BHEL, successful bidder shall deploy Quantity Surveyors within 15 days. However, the successful bidder may note that they should propose suitable manpower so that the required number of Quantity Surveyor are deployed at site/office within 30 days from the date of getting first written intimation from BHEL.
8.0	**Contract Price:**
8.1	For Price schedule refer **Table 1**. The quoted price shall be inclusive of all charges, out of pocket allowances etc. but exclusive of all Taxes which will be quoted separately. No other claim on account of any other expenses shall be entertained by BHEL.
8.2	Price quoted shall be firm and not subject to any escalation whatsoever during the contract period as well as during the period of extension (If any).

9.0	**Terms of Payment & Penalty/ LD Clause:**
9.1	Payment shall be made on actual deployment of Quantity Surveyors at respective locations on man month basis subject to submission of bills by successful bidder on monthly basis.
9.2	Payment shall be made based on actual attendance record maintained at BHEL project site office/ PEM Noida office/ ISG Bangalore Office.
9.3	**Penalty due to absentees of QS:** Payment shall be made on man month basis after deduction of absentees (if any) on pro rata basis. For deduction purpose per day rate shall be calculated by dividing Man Month rate with actual working days in the said calendar month. In case the absentees of any QS personnel are more than 5 working days during any calendar month, a penalty of Rs 500/- per day per QS for absence more than 5 days shall be imposed on successful bidder from the bill of said calendar month or from future bills. However, sum total penalty shall not be more than 10% of contract value.
9.4	**Liquidated Damage (LD):** If the Successful Bidder fails to provide the agreed KPIs/Deliverable within the agreed time frame on monthly basis, BHEL shall have the right to impose Liquidated Damage at the rate of 0.5% of the Monthly Bill, per working day of delay of each KPI from the schedule date, to a maximum of 5% of the contract value. For this purpose, the period for which LD is applicable shall be worked out based on portion of delay solely attributable to Successful Bidder or Quantity Surveyors.

10.0 Price Format: The bidder shall submit the price in the price schedule as per Table 1.

Table-1: Price Format

Sl. No.	Description	UOM	Qty	Rate Excluding Taxes (INR)	Amount (INR)
1	Providing services of "Quantity Surveyor" at BHEL Project site office **LARA,** District- Raigarh, Chhattisgarh as per specifications and as per direction of Engineer Incharge. (QS-1)	MAN-MONTHS	96		
2	Providing services of "Quantity Surveyor" at BHEL office of **PEM- Noida, UP** as per specifications and as per direction of Engineer Incharge. (QS-2)	MAN-MONTHS	24		
3	Providing services of "Quantity Surveyor" at BHEL office **of ISG Banglore, Karnataka** as per specifications and as per direction of Engineer Incharge. (QS-3)	MAN-MONTHS	24		
Total amount excluding Taxes for S. No 1 to 3 (in INR)					

11.0 Annexure A – BOQ items

ANNEXURE A

REFERENCE SCHEDULE OF RATES		
ST NO	**Item Description**	**Unit**
100	**EARTH WORK: Earth work In excavation, backfilling and disposal including all labour, equipments etc complete as per specification, drawing and as directed by engineer- in-charge for the following.**	
101	Earth work in excavation in all types of soil including ash which can be excavated by any means including setting out, levelling, dewatering (but excluding special type of dewatering viz. well point method), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 1Km, 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
b	Depth exceeding 2 m but not exceeding 4 m	CUM
c	Depth exceeding 4 m but not exceeding 6 m	CUM
d	Depth exceeding 6 m but not exceeding 8 m	CUM
e	Depth exceeding 8 m but not exceeding 10 m	CUM
f	Depth exceeding 10 m but not exceeding 15 m	CUM
g	Depth exceeding 15 m but not exceeding 20 m	CUM
h	Depth exceeding 20 m but not exceeding 25 m	CUM
i	Depth exceeding 25 m but not exceeding 30 m	CUM
102	Extra over ST No. 101 for dewatering of ground water by well point method as per IS 9759.	CUM
103	Earth work in excavation in soft rock including weathered rock which can be excavated by means of crow bar, pick axe, pneumatic rock breaker attachment with excavator machine etc but does not require chiselling or blasting including setting out, levelling, dewatering (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 1 Km, 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
b	Depth exceeding 2 m but not exceeding 4 m	CUM
c	Depth exceeding 4 m but not exceeding 6 m	CUM
d	Depth exceeding 6 m but not exceeding 8 m	CUM
e	Depth exceeding 8 m but not exceeding 10 m	CUM
f	Depth exceeding 10 m but not exceeding 15 m	CUM
g	Depth exceeding 15 m but not exceeding 20 m	cum
h	Depth exceeding 20 m but not exceeding 25 m	CUM
104	Earth work in excavation upto any depth below ground level in hard rock requiring blasting (but excluding controlled blasting) including setting out, levelling, dewatering (wherever required), dressing the sides & bottom, all lifts, necessary licenses/statuatory clearances for blasting, supply, storage & handling of blasting materials, stacking/disposal of surplus excavated material within a lead upto 1 Km, 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
b	Depth exceeding 2 m but not exceeding 4 m	CUM
c	Depth exceeding 4 m but not exceeding 6 m	CUM
d	Depth exceeding 6 m but not exceeding 8 m	CUM
e	Depth exceeding 8 m but not exceeding 10 m	CUM
f	Depth exceeding 10 m but not exceeding 15 m	CUM
g	Depth exceeding 15 m but not exceeding 20 m	cum
h	Depth exceeding 20 m but not exceeding 25 m	cum
105	Earth work in excavation in hard rock requiring controlled blasting including wedging, line drilling, pre shearing etc as required, setting out, levelling, dewatering (wherever required), dressing the sides & bottom, all lifts, necessary licenses/statuatory clearances for blasting, supply, storage & handling of blasting materials, stacking/disposal of surplus excavated material within a lead upto 1Km, 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
b	Depth exceeding 2 m but not exceeding 4 m	CUM
c	Depth exceeding 4 m but not exceeding 6 m	CUM
d	Depth exceeding 6 m but not exceeding 8 m	CUM
e	Depth exceeding 8 m but not exceeding 10 m	CUM
f	Depth exceeding 10 m but not exceeding 15 m	CUM
g	Depth exceeding 15 m but not exceeding 20 m	cum
h	Depth exceeding 20 m but not exceeding 25 m	cum

106	Earth work in excavation in hard rock requiring chiselling including setting out, levelling, deawtering (wherever required), dressing the sides & bottom, all lifts, stacking/disposal of surplus excavated material within a lead upto 1Km, 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
b	Depth exceeding 2 m but not exceeding 4 m	CUM
c	Depth exceeding 4 m but not exceeding 6 m	CUM
d	Depth exceeding 6 m but not exceeding 8 m	CUM
e	Depth exceeding 8 m but not exceeding 10 m	CUM
f	Depth exceeding 10 m but not exceeding 15 m	CUM
g	Depth exceeding 15 m but not exceeding 20 m	CUM
h	Depth exceeding 20 m but not exceeding 25 m	CUM
107	Earthwork in 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 earth available within a lead upto 1 Km 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	at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM
b	at least 95% maximum dry density as per IS-2720 (Part-VII)	CUM
108	Earthwork in 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 earth directly from excavation within a lead upto 1Km and compacted as specified including watering, ramming/compaction by manual/mechanical means, dressing etc all complete.for the following:	
a	at least 90% maximum dry density as per IS-2720 (Part-VII)	CUM
b	at least 95% maximum dry density as per IS-2720 (Part-VII)	CUM
109	Extra over ST No. 101 and 103 to 108 for carriage of material/earth for every 500m or part thereof beyond an initial lead of 1km.	
a	Carriage for stacking/ backfilling of serviceable material/ earth	CUM
b	Carriage for disposal of serviceable/unserviceable material/ earth	CUM
110	Earth work in backfilling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness so as to achieve required compaction with approved borrowed soil (borrowed soil to be arranged by the bidder) and compacted as specified including supplying borrowed soil, royalty/seignorage fee (if any), sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, testing, all lead and lifts etc all complete as per specification, drawing and as directed by the engineer for the following:	CUM
111	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.	
	For 80% Relative Density	CUM
112	Extra over item no. 101 for shoring and strutting in trenches including packing cavities (wherever required as instructed by engineer) all complete as per specification and as directed by engineer in charge.	
a	upto depth of 2m	SQM
b	Depth exceeding 2 m but not exceeding 4 m	SQM
200	**CONCRETE WORK: Providing and placing concrete work including cost of labour, materials (unless otherwise specified in BOQ/contract specification) 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	Concrete of grade M7.5 (1 part cement, 4 part sand, 8 parts of 40 mm graded aggregate by volume) as mass filling course, lean concrete, levelling course, mud mat under and around foundations/floors below finished floor level upto depth of 10m from FFL. (For depth greater than 10m from FFL, extra over for additional depth to be paid in Item No 224)	CUM
202	Concrete of grade M10 (1 part cement, 3 part sand, 6 parts of 40 mm graded aggregate by volume) as lean concrete, levelling course, mud mat under and around foundations/floors below finished floor level upto depth of 10m from FFL. (For depth greater than 10m from FFL, extra over for additional depth to be paid in Item No 224)	CUM

203	Concrete of grade M15 (1 part cement, 2 part sand, 4 parts of 40 mm graded aggregate by volume) as lean concrete, levelling course, mud mat under and around foundations/floors below finished floor level upto depth of 10m from FFL. (For depth greater than 10m from FFL, extra over for additional depth to be paid in Item No 224)	CUM
204	Concrete of grade M20 (1 part cement, 1.5 part sand, 3 parts of 10-20 mm graded aggregate by volume) under floors, paving, plinth protection, pipe encasing etc complete below finished floor level upto depth of 10m from FFL. (For depth greater than 10m from FFL, extra over for additional depth to be paid in Item No 224).	CUM
205	Providing and laying Design Mix cement concrete conforming to IS:456 & IS 10262-2009 for reinforced concrete works with sand and graded hard stone aggregate of 20mm nominal size in foundations/substructure, grade slab, paving, drains, under floors etc for 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 below finished floor level upto a depth of 10m from FFL(For depths greater than 10m from FFL, extra over for additional depth to be paid in Item No 224), for the following.	
a	M 20 Grade	CUM
b	M 25 Grade	CUM
c	M 30 Grade	CUM
d	M 35 Grade	CUM
206	Providing and laying Design Mix cement concrete of grade conforming to IS:456 & IS 10262-2009 for reinforced concrete works with sand and graded hard stone aggregate of 20mm nominal size in superstructure for 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 upto 10m level above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 225), for the following.	
a	M 20 Grade	CUM
b	M 25 Grade	CUM
c	M 30 Grade	CUM
d	M 35 Grade	CUM
207	Providing and laying Design Mix cement concrete confirming to IS:456 & IS 10262-2009 for reinforced concrete works of grade mentioned below in machine foundations for TG, Gas Turbine, ID/FD/PA fans, BFP, Mills, Crusher House, CHP-AHP civil works, FGD,etc at all elevations below/above finished floor level (except top decks supported over vibration isolation system and TG deck) but including TG foundation Columns with 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 all complete.	
a	M 30 Grade	CUM
b	M 35 Grade	CUM
208	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) and top deck of TG foundation at all levels including addition of suitable plastisizers conforming to IS9103 to achieve a slump more than 125 mm in concrete as per manufacturers recommendation, preperation 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, embeddments and temperature control of concrete. Payment terms - a) After casting 75% ; b) After receipt of ultrasonic test report - 25%.	CUM
a	M 30 Grade	CUM
b	M 35 Grade	CUM
c	M 40 Grade	CUM
209	Extra over St. No. 205 to 208 for controlling of temperature of fresh concrete 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
210	Extra over ST Nos. 205 to 207 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
211	Providing and encasing of structural steel member with concrete using nominial aggregate size of 12.5mm down. Encased member shall be wrapped with welded wire mesh/chicken wire mesh with proper lap etc. complete as per specification for the following grades	
a	M 20	CUM
b	M 25	CUM

212	Screed concrete conforming to IS 456 with sand and graded hard stone aggregate 12.5mm/6 mm nominal size on the roof upto 10m level above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 225) or thickness, drains etc complete as per following.	
a	01:02:04	CUM
b	01:01:02	CUM
213	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, rendering the top exposed surface with cement sand mortar (1:3), handling, storing, transpoting, all leads, erection without damage, setting in position with cement sand mortar (1:3), filling the gaps between adjacent preacast 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.	
a	M20	CUM
b	M25	CUM
c	M30	CUM
214	Providing and laying Design Mix cement concrete as per IS:456, IS 3370 & IS 10262-2009 for reinforced concrete works using 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 upto depth of 10m from FFL, (For depth greater than 10m from FFL, extra over for additional depth to be paid in Item No 224). for following grades. Watertightness is to be ensured including structural grouting if required.	
a	M25	CUM
b	M30	CUM
215	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
b	Reinforced cement concrete of all grades	CUM
216	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
217	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
218	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
219	Providing and applying curing compound (water based) of approved make where ever required as per manufacturer's specification.	SQM
220	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
221	Providing and laying Design Mix cement concrete conforming to IS:456 & IS 10262-2009 for reinforced concrete works with sand and graded hard stone aggregate of 20mm nominal size in sloped surface of canal lining or channel cast in alternate panels with provision of expansion gap/construction joints 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, compaction with special equipments, etc all complete as per specification & drawing for the following.	
a	M20 Grade	CUM
b	M25 Grade	
222	Cutting of groove of 10mm X 40mm size with groove cutting machine in concrete paving all complete.	RM
223	Cutting of existing concrete/ RCC work inside control room/ pump house or anywhere inside boundary using power tools of (DD2E of HILTI/ BOSCH make) with low noise and dust including cutting reinforcements, removing the rubbish within a lead of 1 km, including making good the broken edges/ surface with cement mortar, painting, finishing to match with existing finishing, scaffolding/ supporting at any level, all complete and as directed by Engineer (measurements shall be taken as per cutting surface area).	SQM
224	Extra over item no. 201 to 205 and 214 for depth below FFL (Finished Floor Level) as per following:	

(a)	Depth exceeding 10m from FFL but not exceeding 20m	CUM
(b)	Depth exceeding 20m from FFL	CUM
225	Extra over item no. 206 and 212 for height above FFL (Finished Floor Level) as per following:	
(a)	Height exceeding 10m from FFL but not exceeding 20m	CUM
(b)	Height exceeding 20m from FFL but not exceeding 30m	CUM
(c)	Height exceeding 30m from FFL but not exceeding 40m	CUM
(d)	Height exceeding 40m from FFL but not exceeding 50m	CUM
(e)	Height exceeding 50m from FFL but not exceeding 60m	CUM
(f)	Height exceeding 60m from FFL	CUM
300	**FORMWORK: Providing, fixing and removing formwork at all elevations for all structures, as per specifications and including all labour, material, scaffoldings and centereing etc. complete as per drawing, specifications and as per direction of engineer in charge for the following.**	
301	Fairface form work with good quality water proof ply wood of minimum 12mm thickness and smooth surface below finished ground floor level for foundations, footings, base of columns, walls, columns, pilasters, beams & slabs(for which scaffolding work not required for vertical support of bottom face of formwork), mass concrete, trenches, grade slab, paving etc.including chamfering of edges as per drawing, specification and instruction of engineer in charge.	
a	Upto Depth 10m From FGL	SQM
b	Depth exceeding 10m From FGL	SQM
302	Fairface form work with good quality water proof ply wood of minimum 12mm thickness and smooth surface above finished ground floor level for columns, beams, suspended/intermediate floors, roofs, lintels, cantilevers, staircases, landings, balconies, etc. including chamfering of edges as per drawing.for all heights as per specification, drawing and instruction of engineer in charge.	
a	For Height Upto 20m from FGL	SQM
b	For Height More Than 20m from FGL	SQM
303	Fairface Formwork with good quality water proof ply wood of minimum 18mm thickness and smooth surface for TG superstructure (above base raft level for columns, connected beams & TG Deck only) 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 complete including chamfering of edges, deshuttering as per drawing,specification, and instruction of engineer in charge..	SQM
304	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.	
a	Upto 150 mm depth	Each
b	Pockets of depths more than 150mm and upto 300 mm depth	Each
c	Pockets of depths more than 300mm and upto 600 mm depth	Each
d	Pockets of depths more than 600mm and upto 1000 mm depth	Each
e	Pockets of depths more than 1000mm and upto 1500 mm depth	Each
f	Pockets of depths more than 1500mm and upto 2000 mm depth	Each
305	Extra over item no.301 and 302 for curved form work for foundations, footings, beams, walls, trenches, domes, arches etc as per specification.	
a	Extra for Curve Shuttering for Item No. 301	SQM
b	Extra for Curve Shuttering for Item No. 302	SQM
306	Fairface form work with good quality water proof ply wood of minimum 12mm thickness and smooth surface below finished ground floor level for Beams, suspended/intermediate floors, lintels, cantilevers, staircases, landings, etc. where scaffolding work is required for vertical support of bottom face of formwork including material, scaffolding, chamfering of edges as per drawing, specification and instruction of engineer in charge.	SQM
307	Fairface formwork with filmface/laminated plywood for RCC Overhead Tanks (with a minimum 15.00m height of supporting RCC columns from FGL) including columns, beams, suspended floors, roofs, lintels, cantilevers, staircases, landings, balconies, domes, arches, etc. for all heights above FGL all complete as per specification, drawing and instruction of engineer in charge.	SQM

308	Inner and outer faces of wind shield with slip form shuttering: Providing and fixing formwork using slipform (inner and outer faces) for concreting in chimney or silo or any other structure for cast in situ, reinforced concrete works of any type and section for all elevations, including labour, materials, equipment, waste of forms, scaffolding, staging, tieing, nailing, caulking, bolting, mantainence, dismantling etc. all complete as per specifications, drawings and instructions of Engineer in charge. (Area of inner face and outer face shall be measured seperately.) Mode of Measurement:- Total formwork quantity in chimney/silo/other structure applicable to Slipform work as per specifications & drawings shall be jointly measured and certified. Certified quantity(SQM) to be paid in line to the unit rate of 308a) i), 308a) ii) & 308a) iii). (The slipform arrangement material shall be the property of contractor)	
a	Design, Engineering, Approval of Drawings, Supply & Installation of Slipform system as per approved drawings duly reviewed & vetted by approved Third Party/Engineering for chimney or silo or any other structure work at site including all safety requirements/arrangements, installation of all supporting items like structural members, winch arrangement, wooden platforms, jacks(including testing by Third Party) & jack-rods, lighting arrangements, panels, passenger cage, nuts/bolts, manpower, all other arrangements necessary for concreting & material shifting, slipping, providing spares for smooth operation, dismantling, etc all complete. Quantity measured for 308a) i), 308a) ii) & 308a) iii) shall be same and shall be restricted to the quantity measured in 308 a iii)	
i)	For Mobilisation & Installation(Payment of the total certified quantity shall be made for mobilisation of slipform only after start of successful slipping as certified by Engineer in charge.)	SQM
ii)	For Dismantling of the Slipform System(Payment of the total certified quantity shall be made only after complete dismantling of slipform as certified by Engineer in charge.)	SQM
iii)	Slipping/Providing formwork at inner and outer faces of wind shield with slip form shuttering with slipform arrangement.(Cost for design, mobilisation, installation & dismantling of slipform shall be paid seperately in Item No 308 a i) & 308 a ii) and cost for slipping/providing & mantainence of slipform work to be paid in this item). Measurement for payment to be done progressively as per actual slipping executed at site.	SQM
400	**REINFORCEMENT WORK : Reinforcement work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling etc at all level as per specification, drawings and as directed by engineer - in - charge.**	
401	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
402	Providing, straightening, cutting, bending, placing in position at any level, binding in position of steel reinforcements of TMT steel of grade Fe-500D or 500EQR 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
403	Transportation, straightening, cutting, bending, placing in position at any level, binding in position of steel reinforcements of TMT steel of grade Fe-500D or 500EQR or HCRM or any other Grade 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.(BHEL to supply steel free of cost)	MT
404	Extra over ST No. 401,402 & 403 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, flexiblity & holiday test, proper packing, safe transportation, touchup at site, etc. complete to ensure proper resistance of FBE against corrosive enviornment. The bidder has to transport 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 coated binding wire.	MT
405	Providing & fixing of Rebar in existing concrete surface by inserting reinforcemnet bar with Epoxy based suitable bonding compound of Hilti or equivalent make (HIT-RE-500 of Hilti or equivalent make) for interconnection of new R.C. structure with existing R.C. structure. Depth of drilled hole should be suitable to develop maximum recommended strength as per approved manufacturer's recommendation. This item includes supply of all materials including bonding chemicals, T&P required to execute the work, cost of all labour, transportation of chemical, staging to reach work place etc. all complete as directed by Engineer - in - Charge. Random Pull out non destructive test as directed by engineer shall beconducted to ensure strength of bond and same is included in this item. Reinforcement bar shall be paid separately under item no. 402, 403, 405 as applicable.	
a	12mm Reinforcement bar	Nos.
b	16mm Reinforcement bar	Nos.
c	20mm Reinforcement bar	Nos.

406	Supply and fixing reinforcement bar couplers (of approved manufacturer's as per the relevant IS code) in position for steel reinforcements of TMT steel of grade Fe-500D or 500EQR or any other Grade confirming to IS:1786 including , labour, scaffolding, transportation to & from stores etc complete all as per specifications, drawings and as directed by Engineer.(Agency has to supply reinforcement bar couplers).	
a	12mm dia	Nos.
b	16mm dia	Nos.
c	20mm dia	Nos.
d	25mm dia	Nos.
e	28mm dia	Nos.
f	32mm dia	Nos.
g	36mm dia	Nos.
h	40mm dia	Nos.
407	Transportation from BHEL yard, straightening, cutting, bending, welding / binding in position of old cut piece TMT steel reinforcements confirming to IS:1786 including binding wire, labour for placing in concrete, chair and other misc. works complete all as per bar bending schedule and as directed by Engineer. [Old cut piece TMT Reinforcement steel will be issue by BHEL Store free of cost]	MT
408	Straightening, cutting, bending of TMT steel reinforcement (Grade Fe-500D or 500EQR) of already fixed/embedded TMT in concrete binding in position including cost of binding wire, labour, scaffolding, etc complete all as per specifications, drawings and as directed by Engineer.[Measurement for payment shall be done for the exposed steel used in concreting. Additional/new TMT Reinforcement steel used in this item will be paid seperately in the relevant Item No 401-403]	MT
500	**Roof Treatment works: Roof treatment works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, curing, sampling, testing etc at all level as per specification, drawings and as directed by engineer - in - charge.**	
501	Providing and laying underbed/topping grading plaster with cement mortar 1:4 (1 cement : 4 sand) and average thickness of 25 mm including preparation of surface, batching, mixing, leveling etc. all complete.	SQM
502	Providing and laying underbed/topping 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
503	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 1:5 (1 cement: 5 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	SQM
b	Average 75 mm thickness	SQM
c	Average 100 mm thickness	SQM
504	Providing and laying rigid insulation (expanded polystyrene blocks) 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) and providing of expansion joint at intervals and filling with sealant in both directions as per the recommendation of manufacturer. The insulating properties shall be such that the thermal conductivity shall not exceed 0.026 Kcal m/m deg C.The block shall be strong enough to withstand without deformation the workload and standard loads expected on the roof. Cost shall include making of fillets, cleaning & preparation of surface, expansion joints at suitable intervals etc all complete for following.	
a	25 mm thickness of rigid insulation (expanded polystyrene blocks)	SQM
b	50 mm thickness of rigid insulation (expanded polystyrene blocks)	SQM
c	75 mm thickness of rigid insulation (expanded polystyrene blocks)	SQM
505	Providing and laying rigid insulation (extruded polystyrene blocks) 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) and providing of expansion joint at intervals and filling with sealant in both directions as per the recommendation of manufacturer. The insulating properties shall be such that the thermal conductivity shall not exceed 0.026 Kcal m/m deg C or as per specification. The block shall be strong enough to withstand without deformation the workload and standard loads expected on the roof. Cost shall include making of fillets, cleaning & preparation of surface, expansion joints at suitable intervals etc all complete for following.	
a	25 mm thickness of rigid insulation (expanded polystyrene blocks)	SQM
b	50 mm thickness of rigid insulation (expanded polystyrene blocks)	SQM
c	75 mm thickness of rigid insulation (expanded polystyrene blocks)	SQM

506	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, polyscrim cloth /fabric, polymerised mortar base preparation, etc all complete as per specifications and directions of engineer in charge.	SQM
507	Providing and laying wearing course consisting of 25mm 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
508	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
509	Providing and laying wearing course consisting of 25mm thick plain cement concrete of proportion M20 (1:1.5:3) with graded aggregate of 12.5mm size cast in panels of maximum size 1.5mx1.5m 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
510	Providing and laying cement concrete chequered flooring tiles of 22 mm thickness and size 300x300 mm conforming to IS 13801 with 8 mm thick 1:4 cement mortar over the top most layer of roofing treatment in pathway or entire area with fine joints including sealing of joints (silicon/elastomeric sealant) and providing expansion gap in both directions including underbed(as per drawings) filled up with (silicon/elastomeric) joint sealant etc all complete. (Water proofing paid elsewhere)(including cost of cement for tiles making)	SQM
511	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
512	Providing and applying water proofing with blown bitumen bonding material conforming to IS:702 of 65/25 grade in Basements, ducts, pits, tunnels etc below the ground level on the concrete surfaces exposed to soil / ash and up to 150 mm above ground level on outside of walls and top of RCC slab including preparation of surface, brick lining single brick thick with 1:4 cement mortar etc. all complete with following number of layers of bitumen felts:	
a	2 Layers of felt for depth up to 5m below ground level for floors	SQM
b	3 Layers of felt for depth beyond 5m below ground level for walls	SQM
513	Providing and mixing water proofing compound conforming to IS:2645 in concrete or cement mortar all complete.	KG
514	Providing and applying concrete structures two coats of ERPB (Epoxy rasin 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 enviornment all complete of approved make and as per manufacturer's recommendation	SQM
515	Providing and applying IP net coating system(min 200 micron thickness) to exposed concrete surfaces of approved make and as per manufacturer's recommendation.	SQM
516	Providing and applying epoxy coaltar based coating system, moisture compatible(min 300 micron thickness) to below ground concrete surfaces of approved make and as per manufacturer's recommendation.	SQM
517	Providing and laying foam concrete blocks in the toilets/sunken slab etc. complete as directed by engineer in charge.	cum
600	**JOINTS AND FILLERS: Joints & fillers including all labour, material, equipment, transportation, handling etc at all level as per specification, drawings and as directed by engineer - in - charge.**	
601	Supplying & installation of bitumen impregnated fibre board confirming to IS 1838 as joint filler at joints in concrete including nailing, coating of both faces with coal tar pitch/bitumin etc. all complete.	
a	12 mm wide joints.	SQM
b	20 mm wide joints.	SQM
c	25 mm wide joints	SQM
d	50 mm wide joints	SQM
602	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
b	20 mm wide joints.	SQM
c	25 mm wide joints	SQM
d	50 mm wide joints	SQM
603	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 (10 mm thick baker rod to be paid separatly):	
a	25mmX25mm groov size	RM
b	50mmX25mm groove size	RM
604	Supplying and filling in position hot applied bitumin sealing compund (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
b	12mm X 25mm	RM
c	20mmX25mm	RM
605	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
b	20 mm wide joints.	SQM
c	25 mm wide joints	SQM
d	50 mm wide joints	SQM
606	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 manufacturer’s recommendations including the material and tools required for jointing, testing, protection, etc all complete. The joints in rubber seals shall be vulcanished as needed.	RM
607	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 manufacturer’s recommendations, to cover it fully including the material and tools required for jointing, testing, protection, etc all complete.	SQM
608	Supplying and filling in position hot applied bitumin sealing compund (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
b	12mm X 25mm	RM
c	20mmX25mm	RM
609	Providing and sealing of joints with premium grade silicon sealant (Silpruf of GE silicons 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: (10 mm thick baker rod to be paid separately)	
a	25mmX25mm	RM
b	50mmX25mm	RM
610	Providing and fixing PVC water stops in joints conforming to IS 12200 & IS 15058 all complete for the following: (Bulb or Kicker type)	
a	150 mm wide and 8 mm thick	RM
b	230 mm wide and 8 mm thick	RM
c	150 mm wide and 6 mm thick	RM
d	230 mm wide and 6 mm thick	RM
611	Providing and fixing copper water stops in joints of deep underground structure all complete for the following:	
a	150 mm wide and 1.6 mm thick	RM
b	230 mm wide and 1.6 mm thick	RM
612	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 (10 mm thick baker rod is to be paid separatly).	
a	25mmX25mm	RM
b	50mmX25mm	RM
613	Providing and fixing G.I strips minimum 1.5mm thk and 150mm wide including fixing accessories etc. all complete.	Kg
614	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

615	Providing and fixing 300 mm wide Stainless steel strips over expansion joints with minimum lap of 50mm length including stainless steel screws, rawl plugs etc. all complete.	Kg
700	**MS EMBEDMENTS: Embedments including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	
701	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
702	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
703	Same as above items 701 & 702 with BHEL supplied material free of cost including loading, transportation, unloading etc. all complete from BHEL store to plant site.	
A	Mild steel embedments, inserts, pipe sleeves, angle pieces, rungs of various diameters, plates of dimensions as required etc.	MT
B	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.	MT
704	Supplying, fabricating, erecting and installing following items in concrete/brickwall for all kind of works, including setting material in concrete, layout, scaffoling, cutting, forming, grinding, drilling, bolting, welding, jointing, testing etc. all complete.	
a	MS pipes of all diameters	kg
b	PVC pipes / conduits of all diameters	kg
c	UPVC pipes / conduits of all diameters	kg
d	Expansion anchor fasteners (galvanised) of HILTI make(HUD-1 Universal Fastners) or equivalent of safe tensile capacity as specified below for brick work with expansion sleeve of A6 polyamide:	
i	8mm Dia	Nos
ii	10mm Dia	Nos
iii	12mm Dia	Nos
iv	14mm Dia	Nos
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	HST M8	Nos
ii	HST M10	Nos
iii	HST M12	Nos
iv	HST M16	Nos
v	HST M20	Nos
vi	HST M24	Nos
f	Chemical Expansion fasteners (galvanised)of HILTI make or equivalent of safe tensile capacity as specified below for concrete work with anchoring rod,nuts,washers,chemicals all complete,etc:	
i	HAS-E5.8 M8	Nos
ii	HAS-E5.8 M10	Nos
iii	HAS-E5.8 M12	Nos
iv	HAS-E5.8 M16	Nos
v	HAS-E5.8 M20	Nos
vi	HAS-E5.8 M24	Nos
705	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.	Nos
706	Supply and installation of approved 25mm thick vibration damping resilient pads on/around foundation of vibrating equipment and at other locations all complete.	SQM
707	Providing, laying and fixing rails(52kg/rm) and guide rails in concrete for transformer, rail track including cutting of rails, joining of rails, anchoring lugs etc all complete.	MT
800	**GROUTING: Grouting including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, roughening surface, cleaning, ramming, curing etc. at all level , drawings and as directed by engineer - in - charge.**	
801	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 maximum 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.	SQM
802	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
803	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 as per specification, drawing and direction of engineer-in-charge. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor).	CUM

804	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 ConbextraGP-1 or equivalent as per specification, drawing and direction of engineer-in-charge. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM
805	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 Conbextra GP-2 or equivalent as per specification, drawing and direction of engineer-in-charge.(Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM
806	Providing Chemical (epoxy) injection grouting with pressure pump for water retaining concrete structures conforming to IS:6494, including fixing nozzles, cost of approved chemical, admixture, curing etc. all complete . Payment shall be made as per the consumption of chemical grout.	Kg
900	**DOORS & WINDOWS: Doors, windows, ventilators, louvers, roof ventilators, rolling shutters, partitions including all labour, material (unless otherwise specified in BOQ/contract specification), equipments, transportation, handling, preparation of working drawings etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	
901	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
902	Providing and fixing teak wood frame panel door shutter as per IS 1003 with 35 mm x 150 mm vertical rail & 35mm x 125 mm horizontal rail and 12 mm thick interlocked panels of teakwood with proper wood joinery including beading, preperation 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 fitting shall be anodised aluminium color dyed), screws, primer and finish painting / polishing etc. all complete. (Finish painting / polishing paid separately)	SQM
903	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
904	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, side, top & bottom edges of shutter shall be reinforced by continous pressed steel chanel with min 18G, shop and final painting etc all complete.	SQM
905	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
906	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)	KG
907	Providing and fixing fire proof steel doors (single or double shutter) with vision panel, 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, NBC 2016 & TAC requirements and as per specification. Vision panel shall be provided with interlayered fire rated glass. Minimum ratings shall be 2 Hrs.	SQM
908	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
b	fixed type	SQM

909	Providing and fixing anodised aluminium work of Jindal, Hindalco or other equivalent approved make for door frames, windows, ventillators, partitions, railing 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-metalic 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 tower bolts, handles, door stopper with rubber shoes, 'L' drops, stays, floor springs, hydraulic door closures etc.), CP brass/stailess steel screws, providing and fixing hinges/pivots, and making provision ford 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, embeddments and temperature control of concrete. Payment term	Kg
910	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.	
a	3mm	SQM
b	4mm	SQM
c	5mm	SQM
911	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
b	Floor mounted Hydraulic door closers	Each
912	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
913	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 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 rivetted with stiffening angles.(partly coiled and lath/full lath).	
a	Hand Operated	SQM
b	Mechanically Operated	SQM
c	Electrically operated	SQM
914	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
915	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
b	4 mm thick clear float glass	SQM
c	5.5 mm thick clear float glass	SQM
d	6 mm thick wired glass	SQM
e	6mm thick Polycarbonate sheet multi (twin) wall fire retardant and ultra violet resistant with sealed open edges.	SQM
f	4 mm thick ground glass	SQM
g	6 mm thick tinted heat reflecting type float glass	SQM
h	6 mm thick clear toughened safety glass	SQM
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
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
k	One outer 6mm thick tinted heat-reflecting type float glass and one inner 6mm thick plain float glass hermetically sealed and seperated by 12 mm thick gap for thermal insulation (only single elevation area to be measured).	SQM
l	6 mm thick laminated glass	SQM
916	Supplying and fixing weather stripping of approved make and quality to doors as per instructions of engineer in charge and specification complete.	RM
917	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
918	Providing and fixing steel louvered window with ISMC 100 frame all round including verticals with 18G pressed steel louvers, painting etc. all complete.	SQM
919	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
920	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 sealent, screws with pvc cap, self tapping screws, epdm rubber gasket.etc all complete as per detailed drawing and specification.	SQM

1000	**BRICKWORK: Brickwork masonry including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, scaffolding etc. at all levels as per specification, drawings and as directed by engineer - in - charge.**	
1001	Providing brick work in cement mortar 1:6 (1 part cement 6 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 bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	CUM
b	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 50 kg/cm2(including cost of cement for brick making)	CUM
c	Using burnt clay bricks of class designation 7.5 of nominal dimension	CUM
d	Using burnt clay bricks of class designation 5.0 of nominal dimension	CUM
1002	Providing brick work in cement mortar 1:6 (1 cement 6 coarse sand) in walls, chambers etc. in thickness 230mm upto 10m level above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 1014), places and position above plinth including raking out joints, curing, scaffolding etc complete but excluding plastering and painting.	
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	CUM
b	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 50 kg/cm2(including cost of cement for brick making)	CUM
c	Using burnt clay bricks of class designation 7.5 of nominal dimension	CUM
d	Using burnt clay bricks of class designation 5.0 of nominal dimension	CUM
1003	Providing brick work in cement mortar 1:4 (1 cement 4 coarse sand) in partition walls, chambers etc. in thickness 115mm upto 10m above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 1015), places and position above or below plinth/graded level including providing two nos. 6 mm diameter MS bars at every third layer, raking out joints, curing, scaffolding etc complete excluding plastering and painting as per specification. (Reinforcement payment shall be made seperately as per applicable BOQ in 400 Series)	
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	SQM
b	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 50 kg/cm2(including cost of cement for brick making)	SQM
c	Using burnt clay bricks of class designation 7.5 of nominal dimension	SQM
d	Using burnt clay bricks of class designation 5.0 of nominal dimension	SQM
1004	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 bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	SQM
b	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 50 kg/cm2(including cost of cement for brick making)	SQM
c	Using burnt clay bricks of class designation 7.5 of nominal dimension	SQM
d	Using burnt clay bricks of class designation 5.0 of nominal dimension	SQM
1005	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
1006	Providing and encasing of structural steel member with masonary work around flanges, webs etc. and filling the gap between steel and masonry by minimum 12mm thick mortar of 1:6 upto 10m level above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 1014). Encased member shall be wrapped with chicken wire mesh with 50mm lap etc. complete as per specification. (Chicken wire mesh to paid separately)	
a	Using fly ash lime bricks confirming to IS 12894 with crushing strength of 75 kg/cm2(including cost of cement for brick making)	CUM
b	Using burnt clay bricks of class designation 7.5 of nominal dimension	CUM
1007	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
1008	Making openings in existing brick wall or partition wall including making good the broken edges/surface with cement mortar 1:6 etc. complete.	CUM
1009	Supply and placing in position mild steel wire fabric(Chicken Wire Mesh) 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
1010	Filling existing brick wall/ partition wall opening at all level including making good the broken edges/surface with cement mortar 1:6, 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
1011	Providing and filling brick bats in soak pits all complete.	CUM
1012	Providing Autoclave Areated concrete blocks in cement mortar 1:4 (1 part cement 4 parts coarse sand) confirming to (IS: 2185 Pt-3) in walls, chambers etc. upto 10m level above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 1014) including raking out joints, curing, scaffolding etc. all complete (excluding plastering and painting) as per specification and drawing.	CUM

1013	Providing Autoclave Areated concrete blocks with approved block laying polymer modified adhesive mortar confirming to (IS: 2185 Pt-3) in walls, chambers etc. upto 10m level above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 1014), including raking out joints, curing, scaffolding etc. all complete (excluding plastering and painting) as per specification and drawing.	CUM
1014	Extra over item no. 1002, 1006, 1012 & 1013 for height above FFL (Finished Floor Level) as per following:	
a	Height exceeding 10m from FFL but not exceeding 20m	CUM
b	Height exceeding 20m from FFL but not exceeding 30m	CUM
c	Height exceeding 30m from FFL but not exceeding 40m	CUM
d	Height exceeding 40m from FFL and above	CUM
1015	Extra over item no. 1003 for height above FFL (Finished Floor Level) as per following:	
a	Height exceeding 10m from FFL but not exceeding 20m	SQM
b	Height exceeding 20m from FFL but not exceeding 30m	SQM
c	Height exceeding 30m from FFL but not exceeding 40m	SQM
d	Height exceeding 40m from FFL and above	SQM
1100	**DAMP PROOF COURSE: Damp proof course including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, shuttering, centering, curing etc at all level as per specification, drawings and as directed by engineer - in - charge.**	
1101	Providing Damp Proof Course of following thickness with 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.	
a	40mm thick	SQM
b	50mm thick	SQM
1102	Providing Damp Proof Course 50mm thick 1:1.5:3 concrete (6 mm and down graded stone chips) with 1% of approved admixture of water proofing compound all complete. Then hot bitumen (residual petroleum bitumen of penetration 80/100 of approved quality) shall be applied over the prepared surface in two coats at the rate of 1.7kg per sq. meter per coat and dry sand spread over it	
a	40mm thick	SQM
b	50mm thick	SQM
1200	**PLASTERING: Cement mortar plaster including making grooves wherever required including all labour, material (unless otherwise specified in BOQ/contract specification), scaffolding, curing etc at all level as per specification, drawings and as directed by engineer - in - charge.**	
1201	Providing 18mm thick plaster in two layers outside the building/boundary wall in cement mortar as applicable upto 10m above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 1206) on walls, finished to a smooth finish including providing 3mmx3mm size grooves at junctions of two dissimilar materials all complete	
a	Cement Mortar 1:6	SQM
b	Cement Mortar 1:4	SQM
1202	Providing 12mm thick plaster internal/external surfaces of building/boundary wall in cement mortar as applicable above finished floor level (For height greater than 10m from FFL, extra over for additional height to be paid in Item No 1206) on walls finished to a smooth finish as per specification all complete.	
a	Cement Mortar 1:6	SQM
b	Cement Mortar 1:4	SQM
1203	Providing 12mm thick plaster in cement mortar 1:6 on walls with rough finish all complete.	SQM
1204	Providing 6mm thick plaster on ceiling in cement mortar 1:4 finished to a smooth all complete.	SQM
1205	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
1206	Extra over Item 1201 to 1202 for plastering on exterior walls over & above 10m height from FGL.	
a	Height exceeding 10m from FGL but not exceeding 20m	SQM
b	Height exceeding 20m from FGL but not exceeding 30m	SQM
c	Height exceeding 30m from FGL but not exceeding 40m	SQM
d	Height exceeding 40m and above	SQM
1207	Forming groove of uniform size from 12X12 mm upto 25X15 mm in plastered surface as per approved pattern, using wooden battens nailed to the under layer, including removal of wooden battons, 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
1208	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 enginner in charge (chicken wire mesh to be paid separately)	SQM
1209	Ruled pointing in masonry in Cement Mortar 1:3 (1 cement and 3 fine sand) including raking out joints, curing etc. complete.	SQM
1210	Providing drip course in cement mortar(1:4) in parapet, chajjas, windor/door heads, architectural facias, fins,etc all complete with all labour, T&Ps as per specification, drawing and instructution of engineer.	RM

1300	**FINISHES TO CONCRETE / PLASTERED SURFACES: Finishes, painting to concrete, plastered surfaces including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, surface preparation, scaffolding etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	
1301	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
1302	Two or more coats of Exterior masonry paint (water or solvent base) of special resins, adhesives and additives mixed with fine, hard stone aggregate and suitable pigment. The paint shall be applied on a coat of primer over dried, prepared plaster surface as manufacturers guidlines. The final finished coating shall be fungus resistant, UV resistant, water repellant, alkali resistant and extremely durable with color fastness as per specification.	SQM
1303	Providing and applying two or more coats of oil bound destemper as per IS 428 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
1304	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
1305	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
1306	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
1307	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
1308	Providing and applying 2 or more coats of Chlorinated Rubber paint of approved brand and colour to floors, walls and ceiling including preparation of surface to receive paint, providing and applying chlorinated rubber zinc phosphate 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, inclusive of intermediate coat of Titanium dioxide / micaceous iron oxide complete as per specifications.	SQM
1309	Two or more coats of fire resistant transparent paint (@3.5 sqm per litre per coat) 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. French polish payment will be made seperately.	SQM
1310	Two or more coats of black anti-corrosive bitumastic painting of approved brand and manufacture to give an even shade complete.	SQM
1311	Two or more coats of synthetic enamel paint of approved make made from synthetic resins and drying oil with rutile titanium dioxide and other selected pigments to give smooth, hard, durable & glossy finish to all interior and exterior surfaces complete.	SQM
1312	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
1313	Providing and applying resin bonded granular textured finish, 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
1314	Providing and applying resin bonded granular textured finish, 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 nominal thickness of 2.5 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
1315	Providing and applying resin bonded granular textured finish, for internal applications shall consist of crushed stone/quartz chips of .5 mm to 1.2 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 nominal thickness of 1.2 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
1316	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
1317	Providing and applying 2 mm thick white cement 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

1318	Providing and applying Synthetic plaster for external applications composed of synthetic fibre and petroleum based chemical similar to RENOVO or equivalent and of approved natural color/shade applied on cured and dried plaster surface.The final finish Paint 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
1319	Providing and applying two or more coats of Acrylic based weather coat paint of approved brand and manufacture and required shade over one coat of primer after necessary cleaning/ washing, preparing the surface using coir brush/ wire brush, sand paper, including filling of cracks with putty wherever required etc. all complete to give smooth, hard, durable & glossy finish over a coat of primer over prepared plaster surface as per manufacturers guidelines. The final finished coating shall be fungus resistant, UV resistant, water repellant and extremely durable with color fastness as per specification.	SQM
1320	Providing and applying acid alkali and oil resistant high build, solvent free, self smoothing, seamless epoxy based amine cured floor finish 150 microns over primer on C.C. flooring	SQM
1321	Providing and applying french polish (minimum 2 coats) on wood surface made from best quality shelac, denatured spirit and other suitable alcohol soluble ingredients and made by a well known approved manufacturer as per IS 348 including required base preparation etc. all complete as per specification	SQM
1400	**FLOORING AND SKIRTING: Flooring and skirting at all level including base layer, labour, material (unless otherwise specified in BOQ/contract specification), equipments, transportation, handling, curing, polishing etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	
1401	Providing and laying 50 mm thick heavy duty cement concrete in flooring with metallic hardener pigmented topping 12mm thick uniform graded treated iron particles in flooring. Under layer of 38mm thick cement concrete mix 1:2:4 (1 cement: 2 sand : 4 stone aggregates 12.5 mm 20 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
1402	Providing and laying 25 mm thick heavy duty cement concrete mix 1:2:4 (1 cement: 2 sand : 4 stone aggregates) flooring with metallic hardener pigmented topping of 10 mm thick uniform graded treated iron particles in skirting and dado. Under layer of 15mm thick cement concrete mix 1:2:4 (1 cement: 2 sand : 4 stone aggregates 12.5 mm 20 well graded) and top layer of 10mm 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 as per specification.	SQM
1403	Providing and laying precast polished heavy duty cement concrete tiles (Carborundum topping pigment content is 3.5 kg per 50 Kg of Cement) of size 300X300X25 thick of approved shade as per IS 1237, including minimum 20mm cement mortar bedding of 1:3 (1 cement : 3 sand) jointed with neat cement slurry@4.4 kg/sqm,labour,materials, 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.(inclusive of cost of cement for tiles manufacturing) all complete for following:	
a	Laid in floors	SQM
b	Laid in skirting	SQM
1404	Providing and laying interlocking M30 Grade concrete blocks in paving with approved colour and pattern and should be laid on the subbase and bedding of sand minimum 50mm thick as per specifications and recommendations of manufacturer.(inclusive of cost of cement for paver manufacturing)	
a	60mm	SQM
b	75mm	SQM
1405	Providing and laying 50 mm thick floor finish with 25mm thk Terrazo Tiles including minimum 25mm thick cement mortar bedding of 1:3 (1 cement : 3 sand) with neat cement slurry@4.4 kg/sqm,labour,materials, etc. all complete.(inclusive of cost of cement for tiles manufacturing)	SQM
1406	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 @4.4kg/sqm spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM
1407	Providing and laying polished Kota stone 14mm to 16mm thk in flooring. Under bed shall average 35mm 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 @4.4kg/sqm spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM
1408	Providing polished Kota stone 18mm to 20mm thk in skirting projecting 6mm from adjacent plaster minimum 12 mm thick cement mortar bedding of 1:3 (1 cement : 3 sand) with thick cement slurry @4.4kg/sqm spread over the surface with fine joint finished including cutting brickwall upto the required depth, edging, finishing etc. all complete.	SQM
1409	Providing polished Kota stone 14mm to 16mm thk in skirting projecting 6mm from adjacent plaster minimum 12 mm thick cement mortar bedding of 1:3 (1 cement : 3 sand) with thick cement slurry @4.4kg/sqm spread over the surface with fine joint finished including cutting brickwall upto the required depth, edging, finishing etc. all complete.	SQM

1410	Marble stone Flooring laid in 50mm overall thickness with 18-20mm thick marble slabs (grade -1) with minium 30mm thick underbed of 1 cement : 2 sand : 4 stone aggregate by volume and brought to proper level.The marbel slabs/tiles laid over underbed with mortar 1:3, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with thick cement slurry @4.4kg/sqm spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM
1411	Marble stone Flooring laid in 50mm overall thickness with 14 -16mm thick marble slabs (grade -1) with minium 35mm thick underbed of 1 cement : 2 sand : 4 stone aggregate by volume and brought to proper level.The marbel slabs/tiles laid over underbed with mortar 1:3, pressed and tapped down with wooden mallet to the proper level, lifted and pressed again with thick cement slurry @4.4kg/sqm spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM
1412	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 30 mm thick 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 @3.3kg/sqm spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM
1413	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 @3.3kg/sqm spread over the surface with fine joint finished including pigments, curing, grinding, granite polishing etc. all complete.	SQM
1414	Providing and laying polished Granite stone 18-20mm thk in skirting and dado with 6mm thick projection from adjacent plaster minimum 12 mm thick cement mortar bedding of 1:3 (1 cement : 3 sand) with thick cement slurry @3.3kg/sqm spread over the surface with fine joint finished including cutting brickwall upto the required depth, edging, finishing etc. all complete. including mortar ,cement slurry ,pigments, curing, grinding,moulding, granite polishing etc. all complete.	SQM
1415	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
1416	Providing and laying vitrified ceramic tiles of polished variety of size 600x600 from reputed / approved manufacturer, complete including underbed of cement mortar 1:3 minimum 20mm thick underbed for flooring and 12mm thick underbed for dado/skirting with neat cement slurry @3.3Kg/sqm etc. all complete for following	
a	7mm thick tiles In flooring	SQM
b	10mm thick tiles In flooring	SQM
c	7mm thick tiles In skirting and dado upto specific height	SQM
d	10mm thick tiles In skirting and dado upto specific height	SQM
1417	Providing and laying vitrified ceramic tiles of matt finish of size 600x600mm from reputed / approved manufacturercomplete including underbed of cement mortar 1:3 minimum 20mm thick underbed for flooring and 12mm thick underbed for dado/skirting with neat cement slurry @3.3Kg/sqm etc. all complete for following	
a	7mm thick tiles In flooring	SQM
b	10mm thick tiles In flooring	SQM
c	7mm thick tiles In skirting and dado upto specific height	SQM
d	10mm thick tiles In skirting and dado upto specific height	SQM
1418	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, cement slurry 3.3kg/sqm complete as per specification laid in pattern of following sizes	
a	400X400 mm	SQM
b	600X600 mm	SQM
1419	Providing and laying granite stone slab of 20mm thickness single piece for wash basin / sink slab /facia of black or approved colour including 20mm underbed of cement mortar 1:3 with cutting,making corners,moulding and opening etc. all complete.	SQM
1420	Providing and laying Heavy Duty dust pressed Ceramic Tiles of 7mm thick of reputed manufacturer of approved finish shade and colour including 20mm underbed of cement mortar 1:3 with neat cement slurry @3.3kg/sqm etc. all complete.	
a	300X300 mm	SQM
b	600X600 mm	SQM
1421	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, Under bed shall be average 43mm thk of 1 cement : 2 sand : 4 stone aggregates by volume and brought to proper level including cement mortar with neat cement slurry @3.3kg/sqm all complete.	SQM
1422	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 6mm 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	20mm thick	SQM

b	38mm thick	SQM
1423	Providing & fixing Acid / Alkali resistant (Chemical resistant) tiles confirming to IS:4457 in flooring/Dado beded and jointed with epoxy mortar all complete for following thicknesses. The tiles should be abrasion resistant & durable.	
a	20mm thick	SQM
b	38mm thick	SQM
1424	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
1425	Providing and laying polished Marble slabs (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 3.3kg/sqm spread over the surface with fine joint finished including moulded marbel nosing, pigments, curing, grinding, making corners, granite polishing etc. complete.	SQM
1426	Providing and laying marble skirting /dado (Approved shade/color /design) equivalent of minimum 20mm thickness projecting 6mm from adjacent plaster all complete including underbed 20mm cement mortar 1:3, with thick cement slurry 3.3kg/sqm spread over the surface scaffolding etc. all complete.	SQM
1427	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 20mm thick 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 @ 3.3kg/sqm including pigments, curing etc all complete for following thicknesses:	
a	5mm thick	SQM
b	7mm thick	SQM
1428	Providing and laying 3mm thick antistatic PVC flooring / skirting of approved shade,as per IS:3462 and laying as per IS:5318 all complete.	SQM
1429	Providing and fixing removable type flooring system 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
1430	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
b	Aluminium strips 40 mm wide and minimum 3 mm thick	RM
c	Brass strips 20 mm wide and minimum 4 mm thick.	RM
1431	Providing and laying wodden panel flooring and skirting of PERGO or equivalent of approved color,shade all complete as per manufacturer specification.	SQM
1500	**ROOFING / SIDE CLADDING: Roofing / side cladding work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, scaffolding, laps, hooks, washers, corner pieces etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	
1501	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 0.7mm 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 polyster 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
b	Span Exceeding 1800mm and upto 2500 mm	SQM

1502	Erection 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 polyster 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
b	Span Exceeding 1800mm and upto 2500 mm	SQM
1503	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
1504	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 275 gm/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 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
1505	Designing, providing, Erection and fixing profiled External Cladding sheet manufactured out of 0.55 mm TCT(Total Coated Thickness) of permanently colour coated zincalume steel (150gsm. zinc-aluminium alloy coating total of both sides as per AS 1397:1993) having 300MPa yield strength. The colour coating shall comprise of 20 microns finish coat over a 5 micron primer coat on the exposed side and a back coat of 5 micron over a primer coat of 5 micron on reverse side.The sheet shall have 500 mm cover width, 47mm height crests at 250mm centres with special male/female side laps and anti-siphoning features to prevent leakage. The sheet shall be fixed with the help of concealed compatible interlocking clips and wafer head zinc coated self drilling fastners/screws 4.2 X 25mm long on to the sub-girts. The clips shall be concealed and no fastners are to penetrate the external sheeting, all complete as per specification.	
a)	final painting with Silicon Modified Polyester(SMP)	SQM
b)	final painting with Super Polyester XRW(as per AS/NZS-2728:1997 Category3).	SQM
1506	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 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 silicon modified super polyester paint of minimum DFT 7 microns over suitable primer.	SQM
1507	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 275 gm/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 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
1508	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 275 gm/sqm total on both sides of both sheets including fixing to supports / rails by concealed fixing system (Z Purlin) , corrosion resistant self tapping / self drilling type fasteners with suitable cap, flashing etc. all complete. The exposed surface of the sheet shall be permanently colour coated with silicon modified polyester paint of minimum dry film thckness (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

1509	Supply, Erection and fixing profiled Internal Cladding sheet manufactured out of 0.6 mm TCT(Total Coated Thickness) of permanently colour coated zincalume steel (150/180 gsm. zinc-aluminium alloy coating mass total of both sides as per AS 1397:1993). The colour coating shall comprise of 20 microns finish coat over a 5 micron primer coat on the exposed side and a back coat of 5 micron over a primer coat of 5 micron on reverse side. The sheet shall have 980 mm cover width, 28mm height crests at 195mm centres with special male/female side laps and anti-siphoning features to prevent leakage. The sheet shall be fixed to the structure by means of self drilling fastners no. 12-24 X 25mm conforms to AS :3566 Class-3 long at valley.Sub- girts of size 50mm X 50mm X 50mm manufactured out of 16G GI (1.6mm GI) 'Z' shape would be fixed the inner sheeting on face side at runner locations all complete as per specification.	
a)	For final painting with Silicon Modified Polyester(SMP)	
i)	For zincalume sheet 150gsm. And having 550Mpa yield strength.	SQM
ii)	For zincalume sheet 180gsm. And having 240Mpa yield strength.	SQM
b)	For final painting with Super Polyester XRW(as per AS/NZS-2728:1997 Category3).	
i)	For zincalume sheet 150gsm. And having 550Mpa yield strength.	SQM
ii)	For zincalume sheet 180gsm. And having 240Mpa yield strength.	SQM
1510	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 150 gm/sqm total on both sides of sheet 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 surface of the sheet shall be permanently colour coated with silicon modified super polyester paint of minimum dry film thckness (DFT) 20 microns over suitable primer. Other face of the sheet shall be provided with silicon modified super polyester paint 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. Payment terms - a)Design - 5%,(b) On receipt of materials at site - 65%; b) On completion of erection & fixing - 30%..	SQM
1511	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.	
a)	For insulation in Sandwitch Cladding	SQM
b)	For underdeck insulation below RCC slabs	SQM
1512	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.	
a)	For insulation in Sandwitch Cladding	SQM
b)	For underdeck insulation below RCC slabs	SQM
1513	Providing and fixing insulation of polystyrene block of 50 mm nominal thickness for under deck insulation including application of glue and tying with lacing wire as per manufacturer's recommendations.	SQM
1514	Providing and installing under deck insulation with resin bonded rock wool 50 mm nominal thickness conforming to IS 8183 having a density of 48kg/cum using minimum 0.05 mm thick aluminium foil on exposed surface followed by 0.56 mm dia and 25 mm mesh GI wire netting, fixed at various elevations with rawl plugs including clips, etc complete as per specifications.	SQM
1515	Providing and installing min 30 mm thick under deck insulation (density 32 kg/cum) polyisocyanurate/rigid phenolic foam (fire retardant and non toxic) using minimum 0.05 mm thick aluminium foil on exposed surface followed by 0.56 mm dia and 25 mm mesh GI wire netting, fixed at various elevations with rawl plugs including clips, etc complete as per specifications.	SQM
1516	Providing and fixing non metal opaque PVC sheet similar to ONDEX roofing or equivalent including all fixing accessories.	SQM
1517	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
1518	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
1600	**FALSE CEILING: False ceiling including all labour, material (unless otherwise specified in BOQ/contract specification), equipment, transportation, handling, suspension system etc at all level as per specification, drawings and as directed by engineer - in - charge.**	
1601	Providing and fixing glass fibre reinforced gypsum plaster board (GRG) ceiling (having gypsum core mixed with glass fibre) system consisting of metal supporting grid system forming panels of specified size, suspended from RCC slab/structural steel or catwalkway grid above with 4 mm (minimum) galvanised wires (rods) with special height adjustment clips, including preperation of working drawing, providing openings for AC ducts, return air grills, light fixtures etc (but excluding the cost of catwalkway grid) all complete as per drawings, specification and instructions of the engineer.	
a	12 mm thick GRG board with galvanised light gauge steel load bearing supporting GI frame and finished flat (seamless).	SQM
b	12 mm thick GRG board in profile (dome ,curved profiled etc.) with galvanised light gauge steel load bearing supporting GI frame and finished smooth (seamless).	SQM

1602	Providing, fixing and laying light weight mineral fiber tile false ceiling of minimum thickness 15 mm and exposed surface semi-perforated with depth of perforation as 4 mm and humid resistance of 95% RH and fire performance of class 0/1 as per BS 476 with metal suspension grid system with galvanized Tees of section 24 X 38 mm for main runners of approved colour and make as per specification including 50mm thick mineral wool insulation (density48kg/cum) as per 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. suitable M.S. channel (minimum MC 75 @ 1.2m) grid shall also beprovided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC ducts etc. complete with cut-outs etc.The size of tiles shall be 600 X 600 mm or 600 X 1200 mm. Required MS channel shall be measured & paid extra under respective item unit rate.	SQM
1603	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. 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
1604	Providing, fixing and laying permanently colour coated aluminium false ceiling of approved colour with stove enamel finsih of approved make in LINEAR and SQUARE type with corrosion resistance aluminium alloys panels of minimum thickness 0.5mm. Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures. A.C. ducts etc. shall also be provided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC ducts etc.The work to be complete as per specifications, drawings and direction of engineer.	SQM
1605	Providing, fixing and laying anodised natural colour matt finished aluminium false ceiling of Jindal/Hindalco make with corrosion resistance aluminium alloys panels of minimum thickness 0.5mm. Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures. A.C. ducts etc. shall also beprovided above the false ceiling level for movement of personnel to facilitate maintenance of lighting fixtures, AC ducts etc.The work to be complete as per specifications, drawings and direction of engineer.	SQM
1606	Providing and Fixing 12mm thick Gypsum board plain/perforated false celing tiles(600x600mm) of India Gypsum or equivalent make in plan or elevation with aluminium grid, metal suspension system, anchor fastener adjustable hangers etc. including 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 manufaturer's specification supported over movment 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
1607	Providing and Fixing 12mm thick Gypsum board plain/ mineral fibre based acoustic ceiling board in plan or elevation with aluminium grid, metal suspension system, anchor fastener adjustable hangers etc. including 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 manufaturer's specification supported over movment platform. The work to be complete as per specifications, drawings and direction of engineer. Payment terms - a) On receipt of Gypsum board false ceiling at site - 50%; b) On completion of erection & fixing - 50%.	SQM
1608	Providing & fixing 12.5 mm thick glass fibre reinforced gypsum plastic board in plan curve or in elevation with aluminium grid, metal suspension system, anchor fastener adjustable hangers etc including 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 MS 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. 24 mm wide exposed flange surface shall be permanently color coated.suspension system shall be as per manufaturer's specification supported over movment platform. The work to be complete as per specifications, drawings and direction of engineer.	SQM
1700	**RAIN WATER DOWN TAKE PIPES: Rain water down take pipes at all level including all labour, material (unless otherwise specified in BOQ/contract specification), transportation, 2 coats of approved paint over one primary coat, fixtures, accessories etc as per specification, drawings and as directed by engineer - in - charge.**	
1701	Providing and fixing HCI down take pipes of 100 mm dia. with water tight lead joint, fixing clamps etc. all complete.	RM
1702	Providing and fixing HCI down take pipes of 150mm dia with water tight lead joint etc. all complete.	RM
1703	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
1704	Providing and fixing galvanised MS down take pipes of 150 mm dia- Medium quality as per IS:1239(part-I) all complete.	RM
1705	Providing and fixing UPVC down take pipes of 110mm diameter- Class 3 as per IS:4985 all complete.	RM
1706	Providing and fixing UPVC down take pipes of 160mm diameter- Class 3 as per IS:4985 all complete.	RM

1707	Providing and fixing GI down take pipes conforming to IS:1239 /IS:3589 of medium duty all complete for following diameters.	
a	100 mm Dia	RM
b	150 mm Dia	RM
c	200 mm Dia	RM
1708	Providing and fixing GI down take pipes conforming to IS:1239 /IS:3589 of heavy duty all complete for following diameters.	
a	100 mm Dia	RM
b	150 mm Dia	RM
c	200 mm Dia	RM
1709	Providing and fixing HDPE down take pipes conforming to IS:4984 as per specification of following diameters.	
a	110 mm Dia	RM
b	160 mm Dia	RM
c	200 mm Dia	RM
1710	Providing and fixing galvanised ERW steel down take pipes of medium duty as per specification of following diameters.	
a	200 mm Dia	RM
b	250 mm Dia	RM
1800	**MISCELLANEOUS: Miscellaneous works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. at all level unless otherwise specified as per specification, drawings and as directed by engineer - in - charge.**	
1801	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
1802	Supply and laying approved quality Stone aggregate 40mm size in transformer yards.	CUM
1803	Supply and laying approved quality rounded pebbles / gravels of 40mm size in transformer yards.	CUM
1804	Providing and fixing weep holes in Retaining wall, drains, etc 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 all complete.	EACH
1805	Providing and mixing approved Bipolar Concrete penetrating Corrosion inhibiting admixture phenolic base (krishna conchem or equivalent) in concrete as per detail specification of manufacturer etc. all complete. Payment shall be made per cum of concrete.	CUM
1806	Providing and mixing approved sodium nitrate based Concrete penetrating Corrosion inhibiting admixture of 'Hindcon' or equivalent in concrete as per detail specification of manufacturer etc. all complete.	CUM
1807	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). Drilling 12mm dia hole @300 c/c using material one liter per hole.	SQM
1808	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
1809	Construction of below ground earthing system test pits as per drawing / sketches including concreting, reinforcement, formwork, providing & fixing GI strip etc as per drawing and specification (excavation & backfilling only will be paid under applicable BOQ items & cement/steel to be supplied by BHEL free of cost)	NO
1810	Construction of below ground earthing system test links as per drawing/ sketches including concreting, reinforcement, formwork, providing & fixing GI strip etc as per drawing & specification (excavation & backfilling only will be paid under applicable BOQ items & cement/steel to be supplied by BHEL free of cost)	NO
1811	Construction of below ground earthing system earth electrodes as per drawing and specification. (Excavation and backfilling only will be paid under applicable BOQ items & steel shall be supplied by BHEL free of cost.)	NO
1812	Construction of below ground earthing system - Earth connection and riser pig tails as per drawing and specification. (Excavation and backfilling only will be paid under applicable BOQ items& steel shall be supplied by BHEL free of cost.)	NO
1813	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.	NO
1814	Construction of below ground earthing system test pits as per drawing/ sketches including brickwork, plaster, providing & fixing GI strips/pipes, GI wires, covers etc as per drawing & specification including associated earthwork.	NO
1815	Providing and fixing GI rungs in concrete/brick walls having zinc coating of minimum 900 g/sqm etc. all complete.	Kg
1816	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.	NO
1817	Providing and laying dry stone pitching of 225 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

1818	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, suface preparation, curing, staging, compatible paintings etc. all complete.	CUM
1819	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
1820	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
1821	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, for dust supression 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
1822	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
1823	Providing and laying cinder filling in the toilets,roads,etc complete as directed by engineer in charge.	CUM
1824	Disposal of scrap steel, scrap wood, broken packing crates, cable scrap, debris and other civil waste, electrical waste materials etc. from project site to a designated place within 5 KM range, with all manpower T & P etc. including loading and unloading as and when directed by BHEL.	
a)	Steel scrap / metal scrap	MT
b)	Debris & Other waste materials.	CUM
1825	Providing & Laying 20micron thick polythene sheet below the concrete base including materials, labour etc. complete as per drawing / direction of engineer.	SQM
1826	Dewatering by Sump Pump Method required for lowering down ground water table (locally and temporarily as required for execution of work at site), payment shall be made as per measurement of excavation below ground water table. Ground water table for the purpose of measurement shall be considered as per nearest bore log data of the approved geo-techncial specification report of BHEL.	CUM
1827	Anti weed chemical treatment of soil with suitable chemical etc all complete.	SQM
1828	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
1829	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.(LDPE liner to be paid extra)	SQM
1830	Supplying, stacking and laying sand of approved quality as sand blanket/cushion over base/bed and on slopes of embankment/canal including screening, washing (wherever required), watering, compaction, dressing, necessary trimming if any including all leads and lifts etc all complete as per specification and as directed by the engineer-in-charge.	CUM
1831	Providing random rubble (RR) stone masonary in founadation, 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
1832	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
1833	Supplying, stacking and laying 150 mm thick sand filter of approved quality behind retaining wall including screening, washing (wherever required), watering, compaction, dressing, necessary trimming if any including all leads and lifts etc all complete as per specification and as directed by the engineer-in-charge.	CUM
1834	Supplying, stacking and laying 150 mm thick gravel filter of approved quality behind retaining wall including screening, washing (wherever required), watering, compaction, dressing, necessary trimming if any including all leads and lifts etc all complete as per specification and as directed by the engineer-in-charge.	CUM
1835	Firecrete for FO tank pad	CUM
1836	Flame arrestor in refinery area CRWS and OWS system	Each
2000	**FENCING AND GATES: Fencing and gates including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc at all level as per specification, drawings and as directed by engineer - in - charge.**	
2001	Supplying and erecting in position 2.4 m high PVC coated gavanised 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

2002	Supplying and erecting in position 2.4 m high gavanised chain linked fencing conforming to IS 2761 of 10G hot dip galvanised steel wires woven in the form of zig-zag mesh giving an opening size of 50 mm square. 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 ST No. 2007)	RM
2003	Supplying and erecting in position 2.4 m high PVC coated gavanised 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
2004	Supplying and erecting in position 2.4 m high gavanised chain linked fencing conforming to IS 2761 of 10G hot dip galvanised steel wires woven in the form of zigzag mesh giving an opening size of 50 mm square. 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.	RM
2005	Supplying and fixing 600mm high G.I. barbed wire fencing on top of boundary wall consisting of min. 6 nos. strands of barbed wire hot dip galvanised wire of 12G comprising of 2 ply with barbs of 16G spaced at 100mm including GI clips, anchors, accessories etc. all complete. (Structural post shall be separately under ST No. 2007) Measurement shall be for per running meter of fencing.	RM
2006	Supplying and fixing 600mm high concertina on top of boundary wall including GI tension wires, clips, anchors, accessories etc. all complete. 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. (Structural post shall be separately under ST No. 2007)	RM
2007	Supply and fixing of hot dip galvanised mild steel posts for fencing. Rate of zinc coating shall not be less than 710 g/m2 on steel posts.	MT
2008	Supply, fabrication and fixing of mild steel posts for fencing including painting etc all complete.	MT
2009	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 stiffners, 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
2010	Supply, fabrication and installing in position and testing MS Gates out of channels, joists, angles, flats, plates, pipes, welded steel wire mesh & sheets including stiffners, 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
2100	**WATER SUPPLY: Water supply work including men, material (unless otherwise specified in BOQ/contract specification), equipment etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	
2101	Providing and fixing in position tested heavy duty type chromium plated (CP) brass long neck/body bib cocks including sockets, union, nuts etc all complete - 15mm nominal bore.	NOS
2102	Providing and fixing in position heavy duty brass stop cock of approved quality including all specials etc all complete - 15mm nominal bore.	NOS
2103	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.	NOS
b	50mm nominal bore.	NOS
2104	Providing and fixing GI pipes class B medium class conforming to IS:1239 pipes shall be concealed and painted with anticorrsive 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
b	20 mm nominal bore.	RM
c	25 mm nominal bore.	RM
d	50 mm nominal bore.	RM
2105	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
b	20 mm nominal bore.	RM
c	25 mm nominal bore.	RM
d	50 mm nominal bore.	RM

2106	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.	NOS
2107	Providing and fixing 610mmx127mmx6mm thk clear glass with C.P Guard rails and mounted on C.P. brackets etc all complete.	NOS
2108	Providing and fixing 25 mm diameter stainless steel towel rails (600mm X 25mm) with C.P. mounting brackets all complete.	NOS
2109	Providing and fixing 20mm dia chromium plated M.S. pipes wall mounted towel rod with C.P. Brackets etc all complete.	NOS
2110	Providing and fixing C.P. Soap holder mounted with C.P. screws etc all complete.	NOS
2111	Providing and fixing stainless steel / C.P. liquid soap dispenser. Dispenser shall be round and easily revolving with removable threaded nozzle and mounted on C.P. brackets etc all complete.	NOS
2112	Providing and fixing glazed vitreous wall mounted paper holder with suitable cover cum cutter fitted with CP screws etc. all complete.	NOS
2113	Providing and fixing chromium plated brass shower rose 100mm dia with 15 or 20 mm inlet dia shower arm all complete.	NOS
2114	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	500 litres capacity	NOS
b	1000 litres capacity	NOS
c	2000 litres capacity	NOS
d	5000 litres capacity	NOS
2200	**SANITARY: Sanitary work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	
2201	Supply and fixing glazed vitreous china Wash Basin of approved make 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
b	Colored	EACH
2202	Providing and fixing approved vitreous china laboratory basin/sink of size 550x400x200mm conforming to IS:2556 (part-5) with R.S. or C.I. brackets, chromium plated brass chain with rubber plug 32mm, 32mm CP brass waste coupling and 32mm CP brass bottle trap with necessaary union complete including painting the fittings, cutting and making good the wall where required etc. all complete.	EACH
2203	Providing and fixing stainless steel kitchen sink of size 610x510x200mm conforming to IS: 13983 including all fittings etc. all complete.	EACH
2204	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, 2 way bibcock with health faucet necessary C.P connections etc all complete.	
a	Floor mounted	EACH
b	Wall mounted	EACH
2205	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, 2 way bibcock with health faucet necessary C.P connections etc all complete.	EACH
2206	Providing and fixing white flat back glazed vitreous china urinals of size 370x315x620 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
2207	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
b	110mm dia pipes	RM
c	160mm dia pipes	RM
d	200mm dia pipes	RM
2208	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
b	300mm dia	RM
c	450mm dia	RM
d	600mm dia	RM
e	900mm dia	RM
2209	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
b	250mm dia	RM
c	300mm dia	RM
d	450mm dia	RM
e	500mm dia	RM

2210	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	450mm dia	RM
b	600mm dia	RM
c	900mm dia	RM
2211	Providing and fixing C.I Manhole heavy duty cover of size 600mmx450mm including frame from reputed manufacture etc. all complete.	EACH
2212	Providing and fixing circular heavy duty C.I. manhole cover of 600 mm dia with frame etc. all complete.	EACH
2213	Providing and fixing square mouth S.W Gully trap grade 'A' complete with CI grating, brick masonry chamber(Clay Brickwork in 1:6 mortar, 12mm plaster in 1:6 mortar & 1:2:4 Cement Concrete) 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
b	150x100mm P or S Type.	EACH
c	150x150mm P or S Type.	EACH
2214	Providing and fixing C.I. floor traps size 100 mm Inlet and 100 mm Outlet Sand Cast Iron S&S as per IS: 1729 with C.P jalli all complete.	EACH
2215	Providing and fixing 100mm heavy duty UPVC floor traps with 100 mm inlet and 100 mm outlet & C.P jalli all complete.	EACH
2216	Providing and installing approved brand single tap water cooler of 80 L cooling capacity all complete.	EACH
2217	Providing and installing approved brand single tap water cooler of 150 L cooling capacity all complete.	EACH
2218	Providing and fixing white viterous urinal partitions of size 675x325x85mm all complete.	EACH
2219	Providing and fixing eye and face drinking water fountain (combined unit with receptacle conforming to IS: 10592) all complete as per specification.	EACH
2220	Providing and fixing heavy duty cast iron pipes for above and below ground sanitory works with water tight lead joint, fixing clamps, excavation, filling, disposal etc. all complete for the following.	
a	75mm dia pipes	RM
b	100mm dia pipes	RM
c	150mm dia	RM
d	200mm dia pipes	RM
e	250mm dia pipes	RM
2221	Providing, laying spun CI pipes with conforming to IS 1536 complete for following.(Excavation,backfilling,concrete to be paid seperately)	
a	75mm dia	RM
b	100mm dia	RM
c	150mm dia	RM
d	200mm dia	RM
e	250mm dia	RM
f	300mm dia	RM
2222	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
b	100 mm dia	RM
c	150 mm dia	RM
d	200 mm dia	RM
2223	Providing and fixing vertical wall mounted water geysers/heaters(minimum 5 star rating) of required capacity including all connections & fittings(angular stop cock and brass connection pipes, etc.) all complete as per specification.	
a	15 Litres	Each
b	25 Litres	Each
2300	**STRUCTURAL WORKS: Structural steel works including all labour, material (unless otherwise specified in BOQ/contract specification), equipments unless otherwise specified, transportation, handling etc. at all level as per specification, drawings and as directed by engineer - in - charge.**	

2301	Fabrication,erection and alignment 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 red oxide 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 & 66o C for welding over 40 mm and upto 63 mm & 110o C for thickness over 63 mm) & use of low hydrogen 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 review and approval of fabrication drgs, in consultation with BHEL(BHEL to supply steel free of cost).	MT
2302	Extra over ST NO. 2301 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
2303	Extra over ST NO. 2301 for providing and application of two coats of primer consisting of chemical resistant epoxy resin and hardener (Minimum 1 Kg of primer mix shall be consumed for priming of 4 to 5 m2 area of surface) instead of primer coat of red oxide zinc-chromate, including touch up painting etc. all complete.	MT
2304	Extra over ST No. 2301 for 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, scoffolding etc. all complete.	MT
2305	Providing and applying intermediate coat of epoxy based Titanium dioxide(TiO2) or Micaceous iron oxide (MIO)of minimum 75micron DFT on steel surfaces already having primer coats, topped with two coats of epoxy based colour finish paint with minimum 70 micron total dry film thickness (DFT) of approved make and shade to achieve an even shade including further finishing with top coat of UV resistant (minimum 30 micron DFT) polyurethane of approved shade including protection and cleaning, scoffolding etc. all complete.	MT
2306	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
2307	Supplying, fabrication, erection and alignment of factory made electroforged galvanised grating units with mild steel having minimum galvanisation 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.	
a	Minimum galvanisation of 610 g/sqm	MT
b	Minimum galvanisation of 900 g/sqm	MT
2308	Supplying, fabrication, erection and alignment of factory made galvanised welded grating units(minimum 610 g/sqm galvanisation) with mild steel 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. fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete.	MT
2309	Extra over above ST NO. 2301/2308 for finishing the grating units/bolts/inserts 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
2310	Extra over above ST NO. 2301 / 2308 for finishing the grating units/bolts/inserts with Cold galvanisation @ 610 gm/sqm over blast cleaned steel surfaces instead of painting with two coats of primer all complete.	MT
2311	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.	KG

2312	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.	KG
2313	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-alighment of all adjacent connected members to their correct positions (weight of such adjacent members and temporarily dismantled members not payable), scafolding, staging, tools & tackles, gas cutting, welding, consumables etc all complete.	MT
2314	Addition to, alterations in and/or modifiction of "Erection Marks" including cutting of parts, gauging of welds, cutting, grinding, fabrication, welding, drilling holes, straightening, removal of bends, raising to the required level, painting, transportation, return of unutilised steel pieces to the project store, temporarily dismantling, cutting, re-welding, supporting and restoring to correct position of all the temporarily dismantled members, realignment of adjacent connected members (weight of such temporarily dismantled and adjacent members not payable) etc all complete for the following:	
a	In erected position	MT
b	In fabrication yard	MT
2315	Re-erection of dismantled fabricated structural steel members including carriage of modified "Erection Marks" from the field fabrication shop to erection site, lifting to required posiion, aligning in position, tack welding, final welding and touch up painting including temporary dismantling and re-erection of temporarily dismantled members, cutting, rewelding, supporting and restoring to the correct position of all temporarily dismnatled members, re-alignment of adjacent connected members(weight of such temporarily dismantled members and adjacent members not payable), scafolding, staging, tools & tackles, gas cutting, welding, consumables etc all complete.	MT
2316	Supply, fabrication and erection of minimum 3.15 mm thick stainless steel liner of grade SS:409M on M.S. plate for inside surfaces vertical portion 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
2317	Supply, fabrication and erection of minimum 4 mm thick stainless steel liner of grade AISI-304; 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
2318	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
b	25 Tons	EACH
c	40 Tons	EACH
d	50 Tons	EACH
e	60 Tons	EACH
f	100 Tons	EACH
g	130 Tons	EACH
h	200 Tons	EACH
2319	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
2320	Supply, fabrication and fixing of stainless steel pipe hand railing conforming to SS 409 of 32 mm/40 mm dia including transportation, loading/unloading etc. all complete..	MT
2321	Supply, fabrication and fixing of MS pipe hand railing of 32 mm/40 mm dia including transportation, loading/unloading etc. all complete. Payments terms - a)on receipt of materials at site - 65%; b) Erection & fixing - 35%;	MT
2322	Supply, fabrication and fixing of GI pipe hand railing (900 mm high) of 32 mm/40 mm dia (Medium Grade) including transportation, loading/unloading, painting etc. all complete.Payments terms - a)on receipt of materials at site - 65%; b) Erection & fixing - 35%;	MT
2323	Conducting radiography test on welds wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM
2324	Conducting ultasonic test on welds wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM
2325	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
2326	Conducting magnetic particle test on welds wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM
2327	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
2328	Supply, fixing lightning arrester and air terminal over roof of power house building, pump house and other structures inluding all materials, labour, electrodes etc complete (all materials to be supplied by the contractor).	NO

2329	**Design, supply, fabrication, erection of stoplog gates, Sluice gates etc. in Pump Houses & other structures** with embedments required, lifting beams, special tools & plants, spare parts for three years, machining, casting, all materials such as structural steel, cast steel, 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, hot double dip galvanised with minimum coating of zinc 750 gms/sqm., following by an application of etching primer and dipping in black bitumen as per B.S. 3416, 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) (SS component shall be measured separately for payment)	MT
2330	SS component mentioned under ST No. 2329	MT
2331	Supplying, fabricating, erecting in position and testing / examining bolted and / or welded structural steel work for stationary screens made out of rolled sections and / or plates including cutting, straightening if required, edge preparation, bolting / welding of joints, cleaning, sand blasting, hot double dip 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.	MT
2400	**ROAD WORKS: Road works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. as per specification, drawings and as directed by engineer - in - charge.**	
2401	Preparation of sub grade by excavating earth to required depth for all types of soil/ rock, dressing to camber and consolidating the base including making good the undulation etc and disposal of surplus earth within a lead upto 1 km etc. all complete.	CUM
2402	Supplying and filling with selected good earth of approved quality in layers not exceeding 300 mm loose thickness using borrowed soil (borrowed soil to be arranged by the bidder) and compacted so as to achieve at least 95 % maximum dry density as per IS-2720 (Part-VII) including 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 etc all complete.	CUM
2403	Providing, stacking & laying granular morrum for shoulder including watering, compaction with road roller to required camber etc all complete.	CUM
2404	Providing & laying water bound macadam sub base course in layers of required thickness with crushed stone aggregates 90 to 40 mm down size (IRC 19 - grading -1), stone screening & blinding material including screening, sorting, spreading to template & consolidation with road roller including carriage, spreading & consolidation of blinding material moorum etc all complete.	CUM
2405	Providing & laying water bound macadam base course in layers of required thickness with stone aggregate 63mm to 40mm size(IRC 19 - grading -1), stone screening and blinding material including screening sorting, spreading to template and consolidation with road roller including carriage, spreading and consolidation of blinding material moorum etc all complete.	CUM
2406	Providing & Laying water bound macadam base course with stone aggregate 50mm to 20mm size stone(IRC 19 -grading -1) screening & binding material including screening, sorting, spreading to template & consolidation with road roller including carriage spreading & consolidation of blinding material moorum etc all complete.	CUM
2407	Providing & applying tack coat of low viscosity liquid bitumen of grade 80/100 confirming to IS 73, 217 or 454 as applicable @10 kg/ 10 sqm for untreated WBM surface including scraping, cleaning with compressed air etc all complete.	SQM
2408	Providing & applying tack coat of low viscosity liquid bitumen of grade 80/100 confirming to IS 73, 217 or 454 as applicable @ 6 kg/ 10 sqm for bituminous surface including cleaning with compressed air etc all complete.	SQM
2409	Providing, mixing & laying of bituminous macadam course of specified thickness using bitumen of grade 60/70 conforming to IS 73, aggregates and binder material including hot mixing, hot laying, rolling etc all complete for the following.	
a	75mm compacted thickness	SQM
b	50mm compacted thickness	SQM
2410	Providing, mixing & laying 25 mm compacted thick premix carpet in a single course composed of suitable small size aggregate premixed with bituminous binder using medium setting grade bitumen on a prepared base including mixing, applying, rolling etc all complete.	SQM
2411	Providing, mixing & laying 25 mm thick semi dense bituminious concrete(SDBC) in a single course composed of suitable small size aggregate premixed with bituminous binder using medium setting grade bitumen on a prepared base including mixing, applying, rolling etc all complete.	SQM
2412	Providing and applying liquid seal coat comprising of an application of a layer of bituminous binder using medium setting grade bitumen at the rate of 9.8kg/10sqm followed by a cover of stone chips at the rate of 0.09 cum/10sqm including rolling etc all complete.	SQM
2413	Supplying and laying 400mmx150mmx350mm deep precast concrete kerb stone of grade M-20 with 20 mm nominal size stone aggregate and of shape as per detailed drawing including fixing with cement mortar (1:2) in 13mm thick joints, finishing of joints with neat cement paste, making drainage opening where required etc all complete.	RM
2414	Providing & laying edge protection on edges of black topping using brick on edge (bricks with crushing strength of 75 kg/cm2) with full brick width (230 mm) etc all complete. Bricks to be placed longitudnally	RM

2415	Supply and laying 150mm dia R.C.C NP-2 type Hume pipe in raised shoulders as rain water drains as per detailed drawing including fixing with cement mortar (1:3) in 13mm thick joints, finishing of joints with neat cement paste etc all complete. Payment terms - a) On receipt of materials at site - 50%; b) On completion of erection & fixing - 50%.	RM
2416	Dismantling of existing road consisting of premix carpet, kerb stone/ brick on edge, bitumen macadem course, WBM, prepairing subgrade to receive new WBM including camber consolidation including disposal of debris within a lead of 1 km etc all complete.	SQM
2417	Providing 25 mm compacted thick premix carpet on existing/damaged road surfaces in a single course composed of suitable small size aggregate premixed with a bituminous binder using medium setting grade bitumen on the existing base including tack coat, cleaning of existing surface, mixing, applying, rolling etc all complete.	SQM
2418	Concrete of grade M10 (1 part cement, 3 part sand, 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. (Cement will be supplied by BHEL free of cost as per TCC)	CUM
2419	Providing and laying cement concrete of grade M30 using 20 mm nominal size stone aggregate with approved admixture (if required), provision for necessary joints including compaction, finishing to lines and grades, curing and providing & fixing forwork etc. all complete. (Excluding the cost of reinforcement and dowel bar) (Cement will be supplied by BHEL free of cost as per TCC)	CUM
2420	Supplying and filling sand for preparation of read sub-base/ sub-grade 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
2421	Providing & laying dry lean cement concrete of grade M15 with 20 mm nominal size graded stone aggregate over a prepared sub-grade including compaction, finishing, curing etc all complete. (Cement will be supplied by BHEL free of cost as per TCC)	CUM
2600	**LEVELING & GRADING: Levelling & grading works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. as per specification, drawings and as directed by engineer - in - charge.**	
2601	Cutting of trees having girth more than 300 mm measured at a height of 1m above ground level including removal of roots, stacking the seviceable material like trunks,branches etc at specified area within the plant boundary and disposal of unseviceable parts/materials witthin a lead upto 1km etc all complete.	
a	300 mm upto 600 mm girth.	Nos
b	601 mm upto 1200 mm girth.	Nos
c	1200mm and above.	Nos
2602	Earth work in stripping of top soil upto a maximum depth of 0.30m below ground level so as to exclude all debris, grass, vegetation, bushes 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.	SQM
2603	Earth work in excavation upto any depth below ground level in all types of soil including moorum, ash which can be excavated by any means for grading including setting out, levelling, dewatering (wherever required), dressing the sides & bottom, levelling to grade, all lifts, ramming/compacting the excavated bottom/graded surface, stacking/disposal of surplus excavated materials within a lead upto 1km, spreading/levelling of disposed materials etc all complete as per specification, drawing and as directed by the engineer-in-charge.	CUM
2604	Earth work in excavation upto any depth below ground level in soft rock (rock without any recovery of exacavated materials in the form of hard stone/boulder) including weathered rock which can be excavated by means of crow bar, pick axe, pneumatic rock breaker attachment with excavator machine etc (but does not require chiselling or blasting) for grading including setting out, levelling, dewatering (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking/disposal of surplus excavated materials within a lead upto 1km, spreading/levelling of disposed materials etc all complete as per specification, drawing and as directed by the engineer-in-charge.	CUM
2605	Earth work in excavation upto any depth below ground level in hard rock requiring blasting (but excluding controlled blasting) including wedging, line drilling, pre shearing etc as required for grading, setting out, levelling, dewatering (wherever required), dressing the sides & bottom, all lifts, necessary licenses/statuatory clearances for blasting, supply, storage & handling of blasting materials, stacking/disposal of surplus excavated material within a lead upto 1km, spreading / levelling of disposed materials etc all complete as per specification, drawing and as directed by the engineer-in-charge.	CUM
2606	Earth work in excavation upto any depth below ground level in hard rock requiring controlled blasting including wedging, line drilling, pre shearing etc as required for grading, setting out, levelling, dewatering (wherever required), dressing the sides & bottom, all lifts, necessary licenses/statuatory clearances for blasting, supply, storage & handling of blasting materials, stacking/disposal of surplus excavated materials within a lead upto 1km, spreading / levelling of disposed materials etc all complete as per specification, drawing and as directed by the engineer-in-charge.	CUM
2607	Earth work in excavation upto any depth below ground level in hard rock requiring chiselling including wedging, line drilling, pre shearing etc as required for grading, setting out, levelling, dewatering (wherever required), dressing the sides & bottom, all lifts, stacking/disposal of surplus excavated material within a lead upto 1km, spreading / levelling of disposed materials etc all complete as per specification, drawing and as directed by the engineer-in-charge.	CUM

2608	Earth work in filling upto any depth below ground level for grading to proper grade and level in layers not exceeding 300mm compacted thickness so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII) with selected approved soil/soft rock directly from excavation within a lead upto1km and compacted as specified including dewatering if required, sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, tesing etc all complete as per specification, drawing and as directed by the engineer for the following.	CUM
2609	Earth work in filling upto any depth below ground level for grading to proper grade and level in layers not exceeding 300mm compacted thickness so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII) with selected approved soil/soft rock from compulsorily excavated earth available within a lead upto 1km and compacted as specified including re-excavation of stacked earth, all lifts, sorting, spreading, breaking clods, watering, ramming/compaction by manual/mechanical means, dressing, finishing to required lines, grades and slopes, tesing etc all complete as per specification, drawing and as directed by the engineer for the following.	CUM
2610	Extra over ST No. 1 to 9 for carriage of unserviceable material/earth for every 500m or part thereof beyond an initial lead of 1km.	CUM
2611	Earth work in filling upto any depth below ground level for grading to proper grade and level in layers not exceeding 300 mm compacted thickness so as to achieve at least 95% maximum dry density as per IS-2720 (Part-VII) with approved borrowed soil (borrowed soil to be arranged by the bidder) and compacted as specified including supplying boorowed soil, 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.	CUM
2612	Providing and laying 225mm thick stone pitching including caulking with 1 cement: 4 sand mortar on the slopes of earth fill/cut with approved quality of rock fragments including materials, testing, necessary excavations if any, compaction etc all complete as per specification, drawing and as directed by the engineer.	CUM
2613	Providing and laying 300mm thick good quality dry stone pitching on the slopes of earth fill/cut with approved quality of rock fragments including materials, testing, necessary excavations if any, compaction etc all complete as per specification, drawing and as directed by the engineer.	CUM
2614	Concrete of grade M10 (1 part cement, 3 part sand, 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
2615	Providing and laying Design Mix cement concrete M25 Grade conforming to IS:456 & IS 10262-2009 for reinforced concrete works with coarse sand and graded hard stone aggregate of 20mm nominal size at any level below / 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.	CUM
2616	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
2617	Providing, straightening, cutting, bending, placing in position at all levels, binding in position of steel reinforcements of TMT steel of grade Fe-500D or 500EQR confirming to IS:1786 including cost of binding wire, labour etc all complete per specification, drawing and as directed by engineer-in-charge.	MT
2500	**PILING WORK: Piling works including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. as per specification, drawings and as directed by engineer - in - charge.**	
2501	Mobilisation of hydraulic rotary piling rigs and accessories capable of pile boring/drilling in all types of strata/installing various size of bored cast in situ RCC piles to project site and demobilisation of the same after completion of piling works etc all complete.	NOS
2502	Mobilisation of Driven cast in situ RCC piling rigs and all accessories capable of installing 500mm/550mm diameter piles in all types of soil, ash to project site and demobilisation of the same after completion of piling works etc all complete. Payments: a) mobilisation and commissioning of rig- 80%, b) demobilisation-20%)	SET
2503	Mobilisation of conventional DMC/RMC piling rigs and accessories capable of pile boring/drilling in all types of strata/installing various size of bored cast in situ RCC piles to project site and demobilisation of the same after completion of piling works etc all complete.	NOS
2504	Installation of Bored cast-in-situ RCC vertical pile as per IS 2911 (Part 1 Sec 2) with diameter and length as specified (length to be measured from pile cut-off level to the bottom of pile) using cement concrete grade M25 conforming to IS:456 with 20 mm nominal size stone aggregates with a minimum cement content of 400Kg per cum of concrete including providing all materials (but excluding reinforcement steel for which measurement/payment shall be made separately), boring/drilling in all types of soil, providing bentonite slurry and/or casing for stabilization of pile bore, flushing of pile bore, cleaning, providing plasticizer wherever required, breaking pile head to cut off level and exposing pile reinforcement for embedment in pile cap etc including empty boring from ground level to pile cutoff level etc all complete as per specification, drawing and as directed by the engineer-in-charge for the following.	
a	Pile with 450 mm diameter and 20 m length below cut off level	Each
b	Pile with 500 mm diameter and 20 m length below cut off level	Each
c	Pile with 550 mm diameter and 20 m length below cut off level	Each
d	Pile with 600 mm diameter and 20 m length below cut off level	Each
e	Pile with 760 mm diameter and 20 m length below cut off level	Each
f	Pile with 900 mm diameter and 20 m length below cut off level	Each

2505	Extra over ST. No. 2504 for pile length more than the specified length of 20m below cut off level for the following.	
a	For 450 mm diameter pile	Rm
b	For 500 mm diameter pile	Rm
c	For 550 mm diameter pile	Rm
d	For 600 mm diameter pile	Rm
e	For 760 mm diameter pile	Rm
f	For 900 mm diameter pile	Rm
2506	Rebate on ST.No.2504 for pile length less than the specified length of 20m below cut off level for the following.	
a	For 450 mm diameter pile	Rm
b	For 500 mm diameter pile	Rm
c	For 550 mm diameter pile	Rm
d	For 600 mm diameter pile	Rm
e	For 760 mm diameter pile	Rm
f	For 900 mm diameter pile	Rm
2507	Installation of driven cast-in-situ RCC vertical pile as per IS 2911 (Part 1, Sec. 1) by driving a suitable MS casing pipe (removable) having detachable MS shoe (flat/conical) at the bottom and driving using atleast 5 MT hammer for the length as specified (length to be measured from pile cut-off level to the bottom of pile)/for the desired set criteria (to be finalised during contract stage) so as to acheive the safe load carrying capacity as mentioned using cement concrete grade M30 conforming to IS:456 with 20 mm nominal size stone aggregates with a minimum cement content of 400Kg per cum of concrete including providing all materials (but excluding reinforcement steel for which measurement/payment shall be made separately), providing plasticser wherever required, breaking pile head to cut off level and exposing pile reinforcement for embedment in pile cap, empty driving etc including providing approved MS shoe(design and drawing of MS shoe shall be submitted by bidder for approval without extra cost to BHEL/Owner) etc all complete as per specification, drawing and as directed by the engineer-in-charge for the following. (Cement & Reinforcement will be supplied by BHEL as per SCC free of cost).	
a	Pile with 450 mm diameter and 20 m length below cut off level	Rm
b	Pile with 500 mm diameter and 20 m length below cut off level	Rm
c	Pile with 550 mm diameter and 20 m length below cut off level	Rm
d	Pile with 600 mm diameter and 20 m length below cut off level	Rm
e	Pile with 760 mm diameter and 20 m length below cut off level	Rm
f	Pile with 900 mm diameter and 20 m length below cut off level	Rm
2508	Extra over ST. No. 2507 for pile length more than the specified length of 20m below cut off level for the following.	
a	For 450 mm diameter pile	Rm
b	For 500 mm diameter pile	Rm
c	For 550 mm diameter pile	Rm
d	For 600 mm diameter pile	Rm
e	For 760 mm diameter pile	Rm
f	For 900 mm diameter pile	Rm
2509	Rebate on ST.No.2507 for pile length less than the specified length of 20m below cut off level for the following.	
a	For 450 mm diameter pile	Rm
b	For 500 mm diameter pile	Rm
c	For 550 mm diameter pile	Rm
d	For 600 mm diameter pile	Rm
e	For 760 mm diameter pile	Rm
f	For 900 mm diameter pile	Rm
2510	Extra over ST.No.2504 for boring/drilling in rock for a length not exceeding 3 times the diameter of pile, cleaning the pile hole, concreting etc all complete for the following.	
a	For 450 mm diameter pile	Rm
b	For 500 mm diameter pile	Rm
c	For 550 mm diameter pile	Rm
d	For 600 mm diameter pile	Rm
e	For 760 mm diameter pile	Rm
f	For 900 mm diameter pile	Rm
2511	Conducting initial load test upto a maximum test load of 2.5 times the safe load capacity on single pile as specified in accordance with IS 2911 Part-4 including preparation of pile head for testing, necessary excavation, all arrangements of loading, unloading, test equipments/ accessories, jacks, recording of results, labour, submission of test report but excluding the cost of installation of pile (installation of pile shall be paid separately) etc. all complete as per specification, drawing and as directed by engineer in - charge for the following:	
a	For vertical compression test by cyclic load method	
i	450 mm diameter pile	Each
ii	500 mm diameter pile	Each
iii	600 mm diameter pile	Each
iv	760 mm diameter pile	Each
v	900 mm diameter pile	Each
b	For lateral load test	
i	450 mm diameter pile	Each
ii	500 mm diameter pile	Each
iii	600 mm diameter pile	Each

iv	760 mm diameter pile	Each
v	900 mm diameter pile	Each
c	For tension/uplift test	
i	450 mm diameter pile	Each
ii	500 mm diameter pile	Each
iii	600 mm diameter pile	Each
iv	760 mm diameter pile	Each
v	900 mm diameter pile	Each
2512	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 excuding 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	
i	450 mm diameter pile	Each
ii	500 mm diameter pile	Each
iii	600 mm diameter pile	Each
iv	760 mm diameter pile	Each
v	900 mm diameter pile	Each
b	For lateral load test	
i	450 mm diameter pile	Each
ii	500 mm diameter pile	Each
iii	600 mm diameter pile	Each
iv	760 mm diameter pile	Each
v	900 mm diameter pile	Each
2513	Carrying out pile integrity test on 450mm/500mm/550mm/ 600mm/760mm/900mm 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
2514	Conducting standard penetration test as per IS:2131 inside pile hole as specified for determining founding level of pile in soil/rock including mobilization of equipments, necessary men, materials etc all complete as required and demobilization of the same after completing of piling, (payment will be made per no. of test conducted in each and every pile hole)	nos
2515	Driving a 550mm diameter empty MS casing pipe with bottom closed with approved detachable MS shoe down to a maximum depth of 20 m below ground level using at least 5MTweigh drop hammer and furnishing the set calculation to establish a safe load carrying capacity of 115 MT in vertical compression including providing detachable MS shoe etc all complete	Each
2516	Design, supplying, installing of sheet pile for earth protection around foundation as per accepted scheme including material, labour, equipment, consumable etc. all complete complying all safety norms and removal of sheet pile after completion of foundation work. this item to be executed after approval of execution scheme by BHEL Engineer. [mode of measurement : Area shall be calculated on the basis of exposed sheet pile area above founding level inside excavated pit]	SQM
3000	**GROUND IMPROVEMENT: Ground improvement work including all labour, material (unless otherwise specified in BOQ/contract specification), equipment etc. as per specification, drawings and as directed by engineer - in - charge.**	
3001	Mobilisation of ground improvement rigs and accessories capable of pile boring/drilling applicable for ST No.3002,3003,3004,3005 in all types of strata/installing various size to project site and demobilisation of the same after completion of piling works etc all complete.	
a	Pneumatic Rig	NOS
3002	Providing and installing 500 mm diameter and 12 m long driven cast-insitu compaction stone column by driving of suitable MS casing pipe (removable) having a detachable M.S.shoe (flat/conical) at the bottom and filling inside the casing pipe in layers of 1m using 1 (sand) : 2 (gravel; gravel shall be 50mm & down) and each layer be well compacted by dynamic compaction method(before compaction, 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 including all materials, equipments etc complete as per specification, drawings and as directed by the engineer-in-charge.	NOS
3003	Providing and installing 500 mm diameter and 15 m long driven cast-in-situ compaction piles by driving of suitable MS casing pipe (removable) having a detachable M.S.shoe (flat/conical) at the bottom and filling inside the casing pipe in layers of 1m using 1 (sand) : 2 (stone aggregate; stone aggregate shall be 50mm & down) and each layer be well compacted by dynamic compaction method (before compaction, 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 including all materials, equipments etc complete as per specification, drawings and as directed by the engineer-in-charge.	NOS

3004	Providing and installing 550 mm diameter and 14 m long driven cast-in-situ compaction piles by driving of suitable MS casing pipe (removable) having a detachable M.S.shoe (flat/conical) at the bottom and filling inside the casing pipe in layers of 1m using 1 (sand) : 2 (stone aggregate; stone aggregate shall be 50mm & down) and each layer be well compacted by dynamic compaction method (before compaction, 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 including all materials, equipments etc complete as per specification, drawings and as directed by the engineer-in-charge.	NOS
3005	Providing and installing 550 mm diameter and 15 m long driven cast-in-situ compaction piles by driving of suitable MS casing pipe (removable) having a detachable M.S.shoe (flat/conical) at the bottom and filling inside the casing pipe in layers of 1m using 1 (sand) : 2 (stone aggregate; stone aggregate shall be 50mm & down) and each layer be well compacted by dynamic compaction method (before compaction, 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 including all materials, equipments etc complete as per specification, drawings and as directed by the engineer-in-charge.	NOS
3006	Mobilisation of ground improvement rigs(for Vibrodisplacement dry method) of stone columns and accessories capable of pile boring/drilling applicable for ST No.3007,3008 in all types of strata/installing various size to project site and demobilisation of the same after completion of piling works etc all complete.	NOS
3007	Providing and installing 550 mm diameter and 14 m long stone column with Vibrodisplacement method (dry method) and filling in layers of 800 mm thick using 40mm down stone aggregate as back fill material and each layer be well compacted by dynamic compaction method and shall be thoroughly compacted . This procedure shall be repeated for each layer till the ground level is reached for ground improvement of pond ash/soil deposit at desired location including all materials, equpiments etc complete as per specifications,drawing and as directed by the engineering -in-charge	NOS
3008	Providing and installing 600 mm diameter and 15 m long stone column with Vibrodisplacement method (dry method) and filling in layers of 800 mm thick using 40mm down stone aggregate as back fill material and each layer be well compacted by dynamic compaction method and shall be thoroughly compacted . This procedure shall be repeated for each layer till the ground level is reached for ground improvement of pond ash/soil deposit at desired location including all materials, equpiments etc complete as per specifications,drawing and as directed by the engineering -in-charge	NOS
3009	Rebate over ST No 3002 and 3003 for not providing 1 (sand) : 2 (stone aggregate; stone aggregate shall be 50mm & down) per metre depth(as specified) from ground level.	CUM
3010	Rebate over ST No 3004 and 3005 for not providing 1 (sand) : 2 (stone aggregate; stone aggregate shall be 50mm & down) per metre depth(as specified) from ground level.	CUM
3011	Rebate over ST No 3007 for not providing 40mm down stone per metre depth(as specified) from ground level.	CUM
3012	Extra over ST. No. 3002 and 3003 for driven cast-in-situ compaction piles having length more than the specified depth below cut off level.	RM
3013	Extra over ST. No. 3004 and 3005 for driven cast-in-situ compaction piles having length more than the specified depth below cut off level.	RM
3014	Extra over ST. No. 3007 for stone column with Vibrodisplacement method (dry method) having length more than the specified depth below cut off level.	RM
3015	Rebate on ST.No.3002 and 3003 for driven cast-in-situ compaction piles for length less than the specified length below ground level .	RM
3016	Rebate on ST.No.3004 and 3005 for driven cast-in-situ compaction piles for length less than the specified length below ground level .	RM
3017	Rebate on ST No.3007 for stone column with vibro displacement method (dry method) having length less than the specified length below ground level.	RM
3018	Making 150mm nominal diameter bore hole up to a maximum depth of 20 m below ground level at various locations in all types of soil including laterite/ash using suitable approved method of boring including chiselling, cleaning, providing casing pipes as required or as directed; performing standard penetration test at every 1 m interval alternate to collection of undisturbed soil samples up to 15 m depth below ground level and at every 1.5 m interval alternate to collection of undisturbed soil samples beyond 15 m depth, at change of strata and at depths wherever undisturbed soil samples could not be collected; collection of undisturbed sample (UDS) at every 1 m interval alternate to conducting standard penetration test up to 15 m depth below ground level and at every 1.5 m interval alternate to conducting standard penetration test beyond 15 m depth; collection of disturbed soil samples and water samples, sealing and packing of samples, observation such as ground water table etc; transportation of all the colyment)lectrodes and other consumables, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat	RM
3019	Excavating trial pit of size 3m x 3m at various locations up to a maximum depth of 4m depth below ground level in all types of soil/ash which can be excavated with pick axe/crow bar etc including sheeting or shoring the sides for the purpose of stability, dewatering and maintaining the pit dry at all times, collecting disturbed/undisturbed samples and conducting field density test at 1m interval, starting from 1m depth below ground level and transporting all the collected samples to the laboratory; backfilling of the pit with excavated material etc all complete as per specification and as directed by the engineer-in-charge.	CUM

3020	Conducting plate load test in various locations at specified depth complete as per specification, drawings and as directed by the engineer-in-charge. Payment for making the pit of suitable size, maintaining it dry and backfilling etc shall be paid separately as per item no.3013.	Nos
3021	Conducting Dynamic cone penetration Test at specified locations as per IS-4968,Part-I for a maximum depth up to 18m below ground level submission of approved test report etc as per specification.	Nos
3022	Conducting laboratory test on soil samples at an approved laboratory including preparation of soil samples to determine the following properties etc all complete as per specification.	
a)	Bulk density and moisture content	Nos
b)	Specific gravity	Nos
c)	Unconfined compressive strength	Nos
d)	Void	Void
e)	unconsolidated undrained test	Nos
f)	One dimensional consolidation test	Nos