

Annexure - II

BILL OF QUANTITY-CUM-PRICE SCHEDULE

Name of Project

: 400kV Substation at BARH

Name of Work

: ALLIED CIVIL WORKS OF YARD & EARTHING WORKS

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
1	Excavation including providing, shoring, strutting, sheeting, bracing, draining and pumping out water other than water below ground water table, clearing all grass, trees, vegetation, etc. including trimming of excavation bottom, stacking, leveling, grading etc. of excavated materials all complete as per specifications and drawings and instructions of the Engineer including lead up to 50 meters and lift up to 2.0 meters.				
a)	In all types of soil	cum	20,000		
2	Extra over item 1 above, for additional lift beyond the initial lift of 2 meters (included in item 1 above) all complete as per specifications and instructions of the Engineer for the lift beyond 2m and upto 4m.	Cu.m	5000		
3	Extra over item 1 above, for carriage of all types of excavated materials				
a)	Carriage beyond initial lead of 50m but not exceeding 500m.	Cu.m	500		
b)	Carriage beyond 500m but not exceeding 1 km.	Cu.m	500		
4	Extra over item 1 above for excavation below ground water table including lowering of ground water table to maintain dry working conditions for all activities upto filling/testing, all complete as per specifications and instructions of the Engineer.	Cu.m	20000		
5	Filling using selected excavated materials in trenches, plinths, sides of foundations and other underground structures, pipes, etc. in layers not exceeding 200mm loose thickness including loading from stack pile, carting, unloading, filling, watering and compacting/ramming each layer, all complete as per specifications, drawings and as directed by the Engineer to achieve 90% standard proctor density.	Cu.m	5		
6	Filling using selected materials in trenches, plinths, sides of foundation and other underground structures, pipes, etc. in layers not exceeding 200mm in loose thickness including all lifts and including excavating, loading, unloading, carting, filling, watering and compacting / ramming each layer, all complete as per specifications, drawing and as directed by the Engineer for the following work:				
	a) With selected sand brought from borrow areas arranged by the Contractor and compacting to 90% relative density including royalties, fees etc. for all leads.	Cu.m	5		
7	Filling in trenches, plinths, sides of foundations and other underground structures with stone 63mm down graded in layer not exceeding 200m in loose thickness	Cu.m	5		
8	Providing and laying Nominal Mix plain cement concrete using graded aggregate at all levels for all kinds of work like mass concrete, bed blocks, lean concrete, mud mat, filling, etc. including labour, materials, equipment, handling, transporting, batching, curing, testing, etc. all complete as per specifications, drawings and instructions of the Engineer but excluding shuttering work :				
a)	1:2:4 (with 20mm nominal size graded aggregates)	Cu.m	10		
b)	1:3:6 (with 20mm nominal size graded aggregates)	Cu.m	100		
c)	1:4:8 (with 40mm nominal size graded aggregates)	Cu.m	2000		

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
9	Providing and laying design mix cement concrete for reinforced concrete work at all levels for all kinds of work, including labour, materials, equipment, handling, transporting, batching, mixing, placing, leveling, compacting, curing, testing, etc., the exposed surface with cement mortar (1:3) to give a smooth and even surface, all complete as per specifications, drawings and instructions of the Engineer, but excluding centering, shuttering and reinforcement work.				
i)	For works below ground level : M-25 (with 20mm nominal size graded stone aggregate)	Cu.m	4000		
ii)	For works above ground level : M-25 (with 20mm nominal size graded stone aggregate)	Cu.m	100		
10	Providing and placing reinforcement, in reinforced concrete and allied works at all levels, for kinds of work, including transportation, cleaning, straightening, cutting, bending, binding in position with annealed wire and/or welding, providing concrete cover blocks, pins, separators, chairs, supports for reinforcement, etc. with all materials, labour, equipment, handling, transporting, testing, etc., preparation of bar bending schedules all complete as per specifications, drawings and instructions of the Engineer.			Reinforcement steel shall be provided by BHEL. Therefore the vendors should quote only labour rates for cutting, bending, binding, placing in position etc.	
a)	For works below ground level (High strength deformed bars)	Tonne	400		
b)	For works above ground level (High strength deformed bars)	Tonne	10		
c)	For works below or above ground level (mild steel bars)	Tonne	5		
11	Providing and fixing formwork of approved quality for cast-in-situ, plain or reinforced concrete works of any type and section (including curved surfaces) at all elevations, waste for forms, shoring, strutting, scaffolding, including labour, materials, equipment, staging, tying, nailing, caulking, bolting, testing, etc. and removal of formwork and staging etc. all complete as per specifications, drawings and instructions of the Engineer:				
a)	For works below ground level (Ordinary formwork)	Sq.m.	25000		
b)	For works above ground level (Ordinary formwork)	Sq.m.	1000		
12	Providing, fabricating including M.S. lugs, transporting, painting, erecting and installing the miscellaneous steel / embedded steel / PVC parts for rail track / cable trenches/ pipe trenches at all levels, including surface preparation, setting material in concrete, furnishing labour, layout, scaffolding and all handling at site, with welding, bolting, drilling, cutting, jointing etc., including application of primer coat on exposed surface supply of all foundation bolts / nuts/lock nuts, washers, etc. all complete as per specifications, drawings and instructions of the Engineer.				
a)	Structural steel sections/plates of all sizes	Tonne	5		
b)	PVC conduits of all sizes	Quintal	2		
c)	Foundation bolts of all sizes	Quintal	2		
d)	M.S.Pipes of all sizes	Quintal	2		
13	Providing and fixing formwork in block-outs/pockets, and openings (above 0.1 sq.m. surface area) at all elevations including cutting, formation of shapes and all other operations required for making the required shape and size, removal of formwork, all complete as per specifications, drawings and instructions of the Engineer.	Sq.m.	2		
14	Grouting of block outs, pockets, foundations, bolts holes and underside of base plates with grout consisting of 2 parts by weight of sand, 1 part by weight of cement including approved plasticizer, non-shrink admixture, in the required proportion as recommended by manufacturer/Engineer, including placing, curing, cleaning, surface preparation, testing, etc. complete preparation, testing, etc. complete with labour, materials, equipment, handling, testing, etc. all complete as per specifications, drawings and instructions of the Engineer.	Cu.m	2		

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
15	Underpinning of the space between the underside of the base plate and the top surface of the concrete pedestal using mix (1:1.25:2) by weight, blended with an approved plasticizer, anti-shrinkage admixtures in required proportions, as specified by manufacturer/Engineer including placing, curing, cleaning, etc. complete with labour, materials, equipment, handling, testing etc. all complete as per specifications, drawings and instructions of the Engineer.	Cu.m.	2		
16	Providing and installation/placing of 225x6mm PVC water stops ribbed with central bulb in concrete as per specification/drawing at all elevation in construction and expansion joints including all materials, sealing compound and labour, etc., all complete as per specification, drawings and instructions of the Engineer.	R.m	4500		
17	Providing and installation of 20mm thick bitumen impregnated fiber board conforming to IS:1838 as joint filler at joints in concrete, including, nailing, coating of both faces with coal-tar pitch/bitumen, cost of labour, materials & equipments etc all complete as per specifications, drawings and instruction of the Engineer.	Sq.m.	10		
18	Providing and filling in position hot applied bitumen sealing compound (Grade A) conforming to IS: 1834, including clearing, mixing, heating, pouring/injecting sealing compound in gaps in joints, at all levels including application of primer, labour, materials, equipment etc all complete as per specifications, drawings & instruction of the Engineer.	kg	20		
19	Providing and mixing cement admixtures for 20 Per bag all types of work including labour, material, (50kg) equipment all complete as per specification of and instructions of the Engineer/manufacturers. cement Plasticizer cum Cement water proofing compound.	Nos. per bag (50kg) of cement	20		
20	Providing & laying in position brick masonry at all levels with bricks of class designation 75 in all types of work in cement mortar 1:6 (1 cement : 6 coarse sand) including mixing mortar, laying bricks, scaffolding, curing, all labour, materials, tools, equipments, safeguards and incidentals necessary to complete the work satisfactorily as per drawings, specifications & instruction of the Engineer.	Cu.m.	300		
21	Providing all material, labour, equipment required for soil sterilization/ anti-weed treatment including clearing all grass, trees, vegetation etc. & mixing/injecting chemicals to achieve the guaranteed effectiveness of the treatment at least up to five years as required/recommended by the manufacturer of the chemical used for soil sterilization/anti-weed treatment including rolling, dressing, compacting the earth to achieve the sub-base required for laying base course and surface course complete as per specification and instructions of the Engineer.	Sq.m.	140000		
	Notes :				
i)	The bidders are required to furnish necessary details pertaining to the antiweed treatment such as the manufacturer's name, their specification, test certificates, etc. along with the bid for Owner's approval.				
ii)	Any modification, if required shall have to be done by the Bidder at no extra cost to Owner. The bidders shall be required to furnish a performance guarantee of three years for antiweed treatment.				
22	Providing, supplying and laying minimum 150mm thick gravel filling in two layers i.e first layer of 75 mm thick base course of 20mm nominal size and second layer of surface course of 75 mm thickness of broken stone	Sq.m.	140000		
24	Providing 12mm thick cement mortar plaster 1:4 (1 cement : 4 coarse sand) at all elevation profiles and levels, finishing with floating coat of neat cement slurry including providing, supplying labour, material, tools, tackles & equipment safeguard and incidents as necessary for handling, laying, placing in position, levelling, finishing, curing, scaffolding, etc. all complete as per drawings, specification and directions of the Engineer.	Sq.m	200		

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
25	Dismantling & Demolition				
a)	Dismantling concrete work for all types of structures at all levels including stacking of structures at all levels including stacking of serviceable material up-to a lead of 2KM, cutting of reinforcement, labour, equipment, safety precautions, all complete as per specification, drawings & instruction of Engineer.				
i)	Plain cement concrete of all grades	Cu.m.	2		
ii)	Reinforced cement concrete of all grades 2 Cu.m.	Cu.m.	2		
b)	Chipping of concrete in reinforced concrete work, cutting pockets, making openings at all levels & according to shapes sizes, & profiles shown on the drawings, disposal of waste material as directed by the Engineer but excluding cutting of reinforcement.	Cu.m.	2		
c)	Cutting of reinforcement, all sizes & types, including labour, equipment, etc. all complete as per specifications, drawings & instruction of the Engineer.	Sq.cm.	50		
d)	Dismantling brick work for all types of structures at all levels including stacking of structures at all levels including stacking of serviceable material up-to a lead of 2KM, labour, equipment, safety precautions, all complete as per specification, drawings & instruction of Engineer.	Cu.m.	5		
Note:	Whenever the demolition work is carried out and adjacent area is affected by demolition work, these shall be repaired with matching finish and cost of such repair shall deem to be included in dismantling cost.				
26	Providing and laying Pre-cast reinforced cement concrete units of M25 grade for cable trench covers or other similar types of work at various elevations, with graded stone chips (20mm nominal size aggregate or less, depending on thickness of the cover) including molding, formwork, batching, mixing, laying, compacting, curing, handling, storing, transporting, all leads, erection/installing without damages, setting in position, rendering or cleaning & finishing all surfaces with cement mortar(1:3), welding where ever required & including making of holes all complete as per drawings, specifications and directions of Engineer. (But excluding cost of reinforcement & inserts)	Cu.m.	600		
27	Providing and supplying labour, materials, tools, tackles and equipment safeguards and incidentals as necessary for construction of embankments, marginal banks, etc. with available approved excavated earth (excluding boulders) in specified areas and to the required slopes, shapes, levels, elevations and profile, 50m leads and all lifts, including cleaning vegetation, slush, etc. loosening compacting in layers watering, consolidating each deposited layer to achieve 95% Proctor density (max. dry density), finishing operations, etc. all complete as per drawings, specification and directions of the Engineer.	Cu.m.	1680		
28	Providing and supplying labour, materials, tools, tackles and equipment safeguards and incidentals as necessary for preparation of sub-grade including removal of vegetation and other extraneous materials, sprinkling water, compacting, rolling by moving two or three passes of 8-10 tonne smooth wheeled roller and consolidating to achieve 95% Proctor density etc. all complete as per drawings, specification and directions of the Engineer.	Sq.m	10500		
29	Providing and supplying labour, materials, tools, tackles and equipment safeguards and incidentals as necessary for stacking and laying of sub-base course with soling stone conforming to grade 1 as per specification, consolidating minimum 260mm thick laid layer of soling stone to 200mm finished thickness laid in two layers, and a moorum cushion layer of 25mm thickness on top of sub-base course rolled with 8 tonne smooth wheeled roller and to the required camber and slopes for all leads and lifts including spreading, compacting, consolidating, packing, rolling, etc. all complete as per drawings, specification and directions of the Engineer.	Sq.m	10500		

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
Note:	If required consolidated thickness of 200mm is not achieved, extra metal thickness shall be provided and consolidated, without any extra cost.				
30	a) Providing and supplying labour, materials, tools, tackles and equipment safeguards and incidentals as necessary for laying of base course (water bound macadam) layer of 75mm finished thickness (stage-I) with course aggregate conforming to grading of table 4-2 of specification, consolidating 115mm thick laid layer of aggregate to 75mm finished thickness by a 8 tonne smooth wheeled roller and to the required camber and slopes for all leads and lifts including preparation of sub-base course, spreading, compacting, consolidating, rolling, applying screening to fill voids in course aggregates, sprinkling, grouting, applying binding material to fill all voids and interstices, water flooding, ramming, setting and drying, etc. all complete as per drawings, specification and directions of the Engineer	Sq.m	10500		
30	b) Providing and supplying labour, materials, tools, tackles and equipment, safeguards and incidentals as necessary for laying of sub-base course (water bound macadam) layer of 75mm finished thickness (stage-II) with course aggregate conforming to grading of table 4-2 of specification, consolidating 115mm thick laid layer of aggregate to 75mm finished thickness by a 8 tonne smooth wheeled roller and to the required camber and slopes for all leads and lifts including preparation of base course, making good pot holes and undulations, spreading, compacting, consolidating, rolling, applying screening to fill voids in course aggregates, sprinkling, grouting, applying binding material to fill all voids and interstices, compacting, water flooding, ramming, rolling, setting and drying, etc. all complete as per drawings, specification and directions of the Engineer.	Sq.m	10500		
30	c) Scarifying metallised road surface of stage-I (water bound macadam) including labour, materials, tools, tackles and equipment, safeguards and incidentals as necessary for scarifying, disposal of rubbish within leads up to 50m, consolidating aggregate with road roller, etc., all complete as per drawings, specification and directions of the Engineer.	Sq.m	10500		
31	Supplying and laying wearing course (semi dense bitumen premix carpet) of 25mm compacted thickness, with 80/100 grade bitumen at the rate of 64kg per cu.m of stone aggregate and 3 cu.m. of stone aggregate (10mm nominal size) per 100 sq.m. area of road including providing labour, materials, tools, tackles and equipment, safeguards and incidentals as necessary for preparation of base, filling pot-holes, application of binder material, applying tack coat with 80/100 grade bitumen at the rate of 0.75 kg per sq.m. area of road, spreading, rolling, finishing, etc. all complete as per drawings, specification and directions of the Engineer.	Sq.m	10500		
32	Supplying and laying 10mm overall thickness seal coat of fine aggregate thoroughly blended with 80/100 grade bitumen at the rate of 68kg per 100 sq.m. area of road surface and 0.60 cu.m. of clean course per 100 sq.m. area of road surface, including providing labour, materials, tools, tackles and equipment, safeguards and incidentals as necessary for preparation of base, healing of course sand and bitumen, spreading, constructing, rolling, compacting with 8-10 tonnes roller, finishing, etc. for all leads and lifts, all complete as per drawings, specification and directions of the Engineer.	Sq.m	10500		
33	a) Laying brick of following thickness and with bricks of class designation 75 conforming to IS:1077 (latest edition) with its length at right angles to both the sides of the road true to line, gradient, camber and slopes, for all leads and lifts, including application of binding material earth and providing and supplying labour, materials, tools, tackles and equipment, safeguards and incidentals as necessary, all complete as per drawings, specification and directions of the Engineer.				
	i) 115mm thickness	Sq.m	7000		
	ii) 75mm thickness	Sq.m	2600		

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
33	b) Laying shoulders on both sides of the road using available excavated earth material including preparation of sub-grade, setting, spreading material in layers not exceeding 150mm thickness, compacting to achieve 95% Proctor density, etc., providing and supplying labour, materials, tools, tackles and equipment, safe guards and incidentals as necessary, all complete as per drawings, specification and directions of the Engineer.	Sq.m	770		
34	a) Providing and fixing fencing above toe wall around switchyard, comprising of 2.4 M high PVC coated galvanised chain link fence of minimum 8 gauge thick and mesh size 75mm and galvanised concertina to a height of 0.6M above fence including posts of MS angles 65x65x6 at 2.5m c/c distance along with stays for corner posts etc. and including embedment of posts in concrete block, tools and tackles, equipment, handling etc. all complete as per drawings, specifications and to the satisfaction of the Engineer (other items like excavation, concrete work for posts and foundation, brickwork, & reinforcement shall be paid separately as per respective item).	RM	2100		
	PILING				
35	Installation of cast-in-situ RCC piles Bored piles of 600 mm dia and 140 Ton capacity by boring through soil with rotary hydraulic drilling rig.	RM	2900		
36	RCC grade M-25 for piling with maintaining top level above cut off level and preparation of pile head for pile of 600 mm dia and 140 Ton capacity	RM	100		
37	Breaking of pile up to cutoff level due to subsequent change of cut off level	CUM	10		
38	Making of 100 mm nominal dia bore hole for performing SPT	RM	100		
39	a) Low strain integrity test on pile - 600 mm dia and 140 Ton capacity	EACH	10		
	b) High strain dynamic (vertical) pile test - 600 mm dia and 140 Ton capacity (Vertical)	EACH	10		
40	Conducting load test on pile including provision and erection of kentledge, anchor piles, load cells for measurement and submission of test result (Excluding cost of installation of piles)				
	a) Initial vertical (cyclic) load test on pile upto 3 times safe vertical load carrying capacity. - 600 mm dia and 140 Ton capacity	EACH	1		
	b) Initial lateral load test on pile upto 3 times safe lateral load carrying capacity. - 600 mm dia and 140 Ton capacity	EACH	1		
	c) Initial pullout load test on pile upto 3 times safe pullout load carrying capacity. - 600 mm dia and 140 Ton capacity	EACH	1		
	d) Routine vertical load test on pile for 1.5 times safe vertical load carrying capacity - 600 mm dia and 140 Ton capacity	EACH	4		
	e) Routine lateral load test on pile for 1.5 times safe lateral load carrying capacity - 600 mm dia and 140 Ton capacity	EACH	4		

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
41	Supplying and laying rail track consisting of two rails (broad gauge) using rails of 52 kg/ m min. under supervision of specialized agency including labour, equipment, for handling,transporting and placing complete as per drawings,specifications and direction of engineers. (other items like concrete, grouting, anchor bolts and Supporting plates shall be paid separately as per respecting items.	RM	200		
42	Supply and filling in transformer foundation pits with broken stone as ballast which is non porous, hard and angular(passing 90% through 50mm sieve but retain 90% through 40mm sieve)including cost of all labour and material and equipment for handling, transporting and placing complete as per drg. Specification and direction of engineer.	CuM	400		
43	Construction of store				
a	Open store (as per specs & drgs enclosed with NIT) Qty may vary as per site requirement	Sq.m	1000		
b	Closed store 150 Sqm (As per drg &specs enclosed with NIT) (Party to quote lumpsum price against this item)	No	1	Lumpsum	
44	For item of works which are required for successful completion of work but not covered in above BOQ items, but are covered under DSR-2002, the quoted figure at serial no "a" of price schedule format shall be applicable and binding to the bidder .	--			
UNDER GROUND EARTHING AND ELECTRODES					
45	Unloading, storing and laying of Underground earthmat of 40 mm dia MS Rods at a depth of 600 mm measured from the top of FGL (either top of gravel or top of land as the case may be) including following works: - excavation of trenches - laying of MS rod for below ground mesh. - welding of rods (refer drawing for Welding details of rods) - bringing out risers just below gravel level near the equipment foundations as per requirement - backfilling of soil - any other work necessary to complete the laying of	KM	21		
46	Fabrication & laying of Auxiliary Mat of 40 mm Dia MS Rods at a depth of 300 mm from top of FGL including excavation & backfilling as per drawing - any other work necessary to complete the laying of earthmat	Nos.	113		
47	Installing of Pipe Electrode: OPTION 1 Installing of Pipe Electrode(to be driven - 3.0 Mtr) as per drawing including following works: - excavation - installing the pipe electrode with alternate layers of Coke & charcoal, salt - backfilling and compaction - Casting the Test Pit with Cast Iron covers - any other work necessary to complete the work (GI Pipe, Nuts, Bolts & Washers and funnel with wire mesh will be supplied by BHEL.	Nos.	10		

S.No.	Description of Item	Unit	Quantity	Unit Rate(Rs)	Amount(Rs)
48	Installing of Pipe Electrode: OPTION 2 Installing of Pipe Electrode(to be driven - 6.1 Mtr that is upto water table. Per meter rate may also be given for increase/decrease in depth if required to arrive at water table.) as per Drg. No. TB-STD-316-Pipe Electrode Rev 00 including following works: - excavation - installing the pipe electrode with alternate layers of Coke & charcoal, salt - backfilling and compaction - Casting the Test Pit with Cast Iron covers - any other work necessary to complete the work (Supply of 40mmNB GI Pipe and other items required	Nos.	0		
49	Installing of 40 mm diameter Rod Electrode with test pit as per drawing including following works: - excavation - installing the pipe electrode - backfilling and compaction - Casting the Test Pit with Cast Iron covers - any other work necessary to complete the work (40 Diameter MS rod will be supplied by BHEL Quantity may vary by +/- ----30-----% at contract stage)	Nos.	40		
50	Installing of 40 mm diameter Rod Electrode without test pit including following works: - excavation/hammering of rod in earth - installing the pipe electrode - backfilling and compaction - any other work necessary to complete the work (40 Diameter MS rod will be supplied by BHEL Quantity may vary by +/- -----30-----% at contract stage)	Nos.	110		
	Total Rs.				