

BILL OF QUANTITYName of Project
Name of Work220/132kV SWITCHYARD AT BARAUNI TPS
: CIVIL WORKS OF ADDITIONAL BAY OF YARD AND
BUILDING

S.No.	Description of Item	Quantity	Unit	Unit Rate(Rs)	Amount(Rs)
1	Earthwork in excavation by mechanical means(Hydraulic excavator)/manual means over areas (exceeding 30cm in depth 1.5m in width as well as 10sqm on plan) including dewatering as necessary of rain water/subsoil seepage water and disposal of excavated earth upto 100m and lift upto 3.5m, disposed earth to be levelled and neatly dressed.				
(a)	All kinds of soil.	7800	cum		
2	Earthwork in excavation by mechanical means (Hydraulic excavator)/manual means in foundation trenches or drains (not exceeding 1.5m in width as well as 10sqm on plan) including dewatering as necessary of rain water/subsoil seepage water and dressing of sides and ramming of bottoms, lift upto 3.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 100m.				
(a)	All kinds of soil.	2180	cum		
3	Filling available excavated earth (including rock) in trenches, plinth, sides of foundations, etc., in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead upto 100m and lift upto 3.5m.	5000	cum		
4	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 3.0 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20cm in depth including consolidating each deposited layer by ramming,watering etc.and disposing of surplus excavated soil as directed within a lead of 100m.				
(a)	All kinds of soil				
4.1	Pipes, cables etc, not exceeding 80mm dia.	10	meter		
4.2	Pipes, cables etc. exceeding 80mm dia. but not exceeding 300 mm dia.	10	meter		
4.3	Pipes, cables etc. exceeding 300mm dia but not exceeding 600mm	10	meter		

5	Carriage & disposal of surplus excavated earth/rock beyond initial lead by mechanical means not necessarily all the times on pucca roads, including loading, unloading, dressing of excavated material, etc., complete as per specifications -.				
(a)	Lead upto 1 km.	2500	cum		
(b)	Lead upto 3 km.	1000	cum		
(c)	Lead upto 5 km.	500	cum		
6	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work upto plinth level.				
(a)	1:2:4 (1 cement : 2coarse sand : 4 graded stone aggregate 20mm nominal size)	10	cum		
(b)	1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40mm nominal size)	10	cum		
(c)	1:4:8(1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size)	400	cum		
7	Providing and laying cement concrete in screed at terrace for water proofing treatment upto floor five level excluding the cost of centring,shuttering and finishing:				
	1:2:4 (1 cement : 2 coarse sand : 4 downgraded stone aggregate 12.5mm nominal size)	100	cum		
8	Extra for providing and mixing water proofing material 'Impermo' or equivalent in cement concrete work in the proportion recommended by the manufacturer.	500	kg		
9	Supplying and filling local/jamuna sand in plinth ,plinth protection, foundation of equipments, trenches and under floors etc. including watering, ramming, consolidating and dressing all complete.	65	cum		
10	Providing, laying and compacting boulder soiling of required thickness in foundations of equipment and under the floors as per direction of Engineer-in-Charge.	100	cum		
11	Supplying chemical emulsion in sealed containers including delivery as specified.				
	Chloropyriphos emulsifiable concentrate of 20%	150	litre		

12	Diluting & injecting chemical emulsion for PRE-CONSTRUCTIONAL ANTI-TERMITE treatment and creating a continuous chemical barrier under and all around the column pits, wall trenches, basement excavation, top surface of plinth filling, junction of wall & floor, along the external perimeter of building, expansion joints, over the top surface of consolidated earth on which apron is to be laid, surroundings of pipes and conduits, etc complete as per specifications (Plinth area of the building at ground floor only shall be measured for payment).	325	sqm		
13	Providing and laying damp proof course 50mm thick cement concrete 1:1.5:3 (1 Cement:1.5 coarse sand : 3 graded stone aggregate 12.5 mm nominal size) .	75	sqm		
14	Applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality using 1.7 kg per sqm on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	75	sqm		
15	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for RCC structural elements including roads excluding the cost of centering, shuttering, finishing and reinforcement including admixtures in recommended proportions (as per IS 9103) to accelerate, retard setting of concrete, improve workability without impairing strength and durability. - M25 grade reinforced cement concrete by using minimum 410kg of cement per cum of concrete.				
(a)	All works upto floor V level.	2400	cum		
16	Centering and shuttering including strutting, propping, etc., and removal of form for:				
(a)	Foundations, footings, bases of columns, etc., for mass concrete.	1450	sqm		
(b)	RCC walls at all levels (any thickness).	4500	sqm		
(c)	Suspended floors, roofs, landings, balconies, chajjas and access platforms at all levels.	350	sqm		
(d)	Lintels, beams, plinth beams and cantilevers.	1200	sqm		
(e)	Columns, Pillars, Piers, Posts and Struts .	2400	sqm		
(f)	Stairs	15	sqm		

17	Extra for additional height in centring ,shuttering wherever required with adequate bracing ,propping etc. including cost of deshuttering and decentring at all levels over a height of 3.5 meter for every additional height of 1 meter or part thereof (Plan area to be measured).				
	Suspended floors ,roofs ,landing,beams and balconies .	200	sqm		
18	Steel reinforcement -Cold twisted bars /TMT- Fe 500				
(a)	Excluding supply but including straightening, cutting,bending, binding, (i/c cost of binding wire), placing in position, etc., all labour & material, complete.(See Note 1)	365000	kg		
19	Brickwork with F.P.S.bricks of class designation 75 in foundation and plinth in:				
	Cement mortar 1:6 (1 cement : 6 coarse sand)	15	cum		
20	Brickwork with F.P.S.bricks of class designation 75 in superstructure above plinth level to floor V level in all shapes and sizes in:				
	Cement mortar 1:6 (1 cement : 6 coarse sand)	165	cum		
21	Half brick masonry with bricks of class designation 75 in foundation and plinth in:				
	Cement mortar 1:4 (1 cement : 4 coarse sand)	15	sqm		
22	Half brick masonry with bricks of class designation 75 in superstructure above plinth level to floor V level.				
	Cement mortar 1:4 (1 cement : 4 coarse sand)	15	sqm		
23	Extra for providing and placing in position 2 Nos 8mm dia bars at every third course of half brick masonry (with FPS bricks)	15	sqm		

24	Providing and fixing ISI marked flush door shutters decorative type ,core of block board construction with frame of 1st class hard wood and well matched reak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
	35 mm thick including ISI marked Stainless Steel butt hinges with nessary screws.	175	sqm		
25	Providing and fixing aluminium sliding door bolts anodised (anodic coating not less than grade AC 10 as per IS: 1868) transparent or dyed to required colour or shade with nuts and screws etc., complete.				
	300 X 16mm	20	each		
26	Providing and fixing aluminium tower bolts anodised (anodic coating not less than grade AC 10 as per IS: 1868) transparent or dyed to required colour or shade with necessary screws etc., complete.				
	300 X 10mm	40	each		
27	Providing and fixing aluminium handles anodised (anodic coating not less than grade AC 10 as per IS: 1868) transparent or dyed to required colour or shade with necessary screws etc., complete.				
	125mm	40	each		
28	Providing and fixing IS:3564 marked aluminium die cast body tubular type universal door closer of approved quality and make with accessories and screws complete.	10	each		
29	Supplying and fixing rolling shutters of approved make, made of required size MS laths 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 mechanical arrangement for operation complete including the cost of providing and fixing necessary 27.5cm long wire springs grade no. 2 and MS top cover of required thickness for rolling shutters.				
	80 X 1.20mm MS laths with 1.20mm thick top cover.	30	sqm		

30	Providing and fixing ball bearing for rolling shutters.	4	each		
31	Providing and fixing pressed steel door frames manufactured from commercial mild steel sheet of 1.25mm thickness including hinges, jamb, lock jamb, bead and if required angle threshold of mild steel angle of section 50X25mm, or base ties of 1.25mm pressed mild steel welded or rigidly fixed together by mechanical means, adjustable lugs with spit end tail to each jamb including steel butt hinges 2.5mm thick with mortar guards, lock strike plate and shock absorbers as specified and applying a coat of approved steel primer after pre-treatment of the surface as directed by Engineer-in-Charge:				
	Profile C	280	RM		
32	Structural steelwork welded in built up sections like edge protection angles ,pipes,insert plates with lugs & framed work including providing, cutting, hoisting, fixing in position/ embedding in concrete and applying a priming coat of approved steel primer all complete.(Structural steel shall be supplied by BHEL free of cost)	14000	kg		
33	Steelwork welded in built up sections/framed work including providing ,cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc., as required.(Structural steel shall be supplied by BHEL free of cost)				
(a)	In covering of floors/trenches of control room building with chequered plates, stringers, treads, landings etc of staircases involving use of chequered plates, wherever required, all complete.	12000	kg		
(b)	In gratings, frames, ladders, stair railings, gates (including pipes), rails, ISMB, ISMC and similar works.	4500	kg		
34	Cement concrete flooring 1:2:4 (1cement : 2 coarse sand : 4 graded stone aggregate) finished with a floating coat of neat cement including cement slurry, but excluding the cost of nosing of steps, etc., complete.				
	40mm thick with 20mm nominal size stone aggregate.	20	sqm		

35	52mm thick CC flooring with " Hardcrete" concrete hardner topping under layer 40mm thick CC 1:2:4 (1 cement:2 coarse sand :4 graded stone aggregate 20mm nominal size) and top layer 12 mm thick Hardcrete cement hardner consisting of mix 1:2 (1 cement hardner mix: 2 stone aggregate 6mm nominal size) by volume with which Hardcrete hardening compound of approved quality is mixed @ 2 liter Hardcrete per 50 Kg of cement including cement slurry, but excluding the cost of nosing of steps etc., complete.	265	sqm		
36	Cement plaster skirting (upto 30cm height) with cement mortar 1:3 (1cement: 3 coarse sand) finished with a floating coat of neat cement.				
	18mm thick	35	sqm		
37	Precast terrazo tiles min. 22 mm thick with graded marble chips of size upto 12mm laid in floors, and landings, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles laid over 20mm thick bed of cement mortar 1:4 (1 cement : 4 coarse sand) to make overall thickness of flooring 50mm.				
	Light shade using white cement	20	sqm		
38	Precast terrazo tiles min. 22 mm thick with graded marble chips of size upto 12mm laid in skirting and risers of steps not exceeding 30 cm in height on 12mm cement plaster 1:3(1 cement :3 coarse sand), jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles of :				
	Light shade using white cement	5	sqm		
39	Providing and fixing 20mm thick acid and or alkali resistant tiles of approved make and colour using acid and or alkali resisting mortar bedding and joints filled with acid and or alkali resisting cement as per IS : 4457 complete as per the direction of Engineer-in- Charge				
(a)	In flooring on a bed of min.20 mm thick mortar 1:4 (1appropriate cement : 4 coarse sand)	60	sqm		
(b)	In dado / skirting on 12 mm thick mortar 1:4 (1 appropriate cement : 4 coarse sand)	70	sqm		
40	Making khurras 45X45cm with average minimum thickness of 5cm cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate of 20mm nominal size) over PVC sheet 1mX1mX400micron, finished with 12mm cement plaster 1:3 (1 cement: 3 coarse sand) and a coat of neat cement rounding the edges and making and finishing the outlet complete.	20	Each		

41	18mm cement plaster in two coats under layer 12mm thick cement plaster 1:5 (1 cement :5 coarse sand) finished with a top layer of 6mm thick 1:6 (1cement:6 fine sand)	650	sqm		
42	12mm cement plaster on even side of the walls in the mix:				
	1:6 (1cement :6coarse sand)	400	sqm		
43	2mm thick plaster of paris punning over the plastered surfaces on wall surfaces as directed by engineer-in-charge.	1000	sqm		
44	6mm cement plaster to ceiling of mix				
	1:3 (1 cement : 3 fine sand)	700	sqm		
45	Applying priming coat				
(a)	With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel galvanised iron/ steel works.	200	sqm		
(b)	Applying one coat of cement primer of approved brand and manufacture on wall surface:	50	sqm		
46	Distempering with oil bound washable distemper of approved brand and manufacture two or more coats over and including priming coat with cement primer.(Work to be carried as per relevant IS codes.)	100	sqm		
47	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade.				
	Two or more coats on new work.	100	sqm		
48	Finishing walls with water proofing cement paint " Snowcem-Plus" of M/s Snowcem India Ltd. or equivalent of required shade :				
	New work : Two or more coat.	450	sqm		
49	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade:				
	Two or more coats on new work.	50	sqm		
50	Painting with acid proof paint of approved brand and manufacture of required colour to give an even shade.				
	Two or more coats on new work.	150	sqm		
51	Forming groove of uniform size from 12X12mm and upto 25X15mm in plastered surface and joints of ceiling and wall as per approved pattern using wooden battens, nailed to the underlayer including removal of wooden battens, repairs to the edges of plaster panel and finishing the groove complete as per specifications and directions of the Engineer-in-charge.	220.00	RM		

52	Making plinth protection 50mm thick cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 20mm nominal size) over 75mm bed by dry brick ballast 40mm nominal size well rammed and consolidated and grouted with fine sand including finishing the top smooth.	200.00	sqm		
53	Providing and fixing wash basin of approved colour and size with CI bracket , 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings etc. cutting and making good the walls wherever required:				
	Vitreous China wash basin size 630 x 450mm with a pair of 15mm C. P. brass pillars taps	1	each		
54	Providing and fixing 100 mm sand cast iron grating for gully, floor or Nahani trap.	2	each		
55	Providing and fixing 600 x 450 x5.5 mm bevelled edge mirror of float glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. Brass screws and washers complete.	1	each		
56	Providing and fixing 600 x 120 x 5 mm glass shelf with edges rounded off supported on anodised aluminium angle frame with C.P. Brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc. complete.	1	each		
57	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with C.P. Brass screws with concealed fitting arrangement of approved quality and make.				
	600 mm long towel rail with total length of 645mm,width 78mm and effective height 88mm,weing not less than 190gms.	1	each		
58	Providing and fixing PTMT liquid soap container 109mm wide,125mm high and 112mm distance from wall of standard shape with bracket of same materials with snap fittings of approved quality ,colour and make ,weighing not less than 105 gm (Prayag or equivalent).	1	each		
59	Providing and fixing soil, waste and vent pipes:				
	100mm dia.				
	Sand cast iron S & S pipe.	5	RM		
60	Providing and fixing M.S holder-bat clamps of approved design to Sand Cast iron/ cast iron (spun) pipe embedded in and including cement concrete blocks 10 x 10 cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including cost of cutting holes and making good the walls etc.				
	For 100 mm dia pipe	2	each		

61	Providing lead caulked joints to SCI pipes and fittings of diameter				
	100mm	4	each		
62	Providing and fixing SCI trap of self cleansing design with SCI screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors:				
	100mm inlet and 100mm outlet.	1	each		
63	Providing and fixing G.I. Pipes (medium grade) complete with G.I. Fitting and clamps , including cutting and making good the walls etc. (internal work).				
(a)	15 mm dia nominal bore.	5	RM		
(b)	20 mm dia nominal bore.	5	RM		
(c)	25 mm dia nominal bore.	5	RM		
64	Providing and fixing G.I. Pipes (medium grade) complete with G.I. Fitting and clamps , including trenching and refilling, etc. (external work).				
(a)	15 mm dia nominal bore.	5	RM		
(b)	20 mm dia nominal bore.	5	RM		
©	40 mm dia nominal bore.	5	RM		
65	Making connection of GI distribution branch with GI main of following sizes by providing and fixing tee, including cutting and threading the pipe etc., complete.				
	25 to 40mm nominal bore.	1	each		
66	Providing and fixing brass bib cock of approved quality				
	15mm nominal bore	1	each		
67	Providing and fixing brass stop cock of approved quality				
	15mm nominal bore	1	each		
68	Providing and fixing brass gate valve with CI wheel of approved quality (screwed end)				
(a)	25mm nominal bore	1	each		
(b)	32mm nominal bore	1	each		
69	Providing and fixing ball valve brass of approved quality complete.				
	High or low pressure with plastic floats				
	15mm nominal bore	1	each		

70	Providing and placing on terrace (at all floor levels) polyethylene water storage tank of approved brand and manufacture with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank. The tank should be ISI marked .	1000	per litre capacity		
71	Providing, laying and jointing glazed stoneware pipes grade 'A' with stiff mixture of cement mortar in the proportion of 1:3 (1 cement : 3 fine sand) including testing of joints etc. complete.				
(a)	100 mm diameter.	5	RM		
(b)	150 mm diameter.	5	RM		
72	Providing and fixing square-mouth S.W. Gully trap grade 'A' complete with C.I. Grating brick masonry chamber with bricks of class designation 75 and water tight C.I. Cover with frame of 300 x 300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as standard design.:				
	100 x 100 mm size P type				
	With F.P.S bricks	1	each		
73	Constructing brick masonry manhole with 75 class designation bricks in cement mortar 1:4 (1 cement: 4 coarse sand) RCC top slab with 1:2:4 mix(1 cement:2 coarse sand: 4 graded stone aggregate 20mm nominal size) foundation concrete 1:4:8 (1 cement: 4 coarse sand: 8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3 (1 cement: 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 mix(1 cement:2 coarse sand: 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement complete as per standard design.				
	Inside size 90X80cm and 45cm deep including CI cover with frame (light duty) 455X610mm internal dimensions total weight of cover and frame to be not less than 38kg (weight of cover 23kg and weight of frame 15kg)				
	With FPS bricks	1	each		

74	Extra for depth for manholes				
	Size 90X80cm				
	With FPS bricks	2	RM		
75	Providing and fixing anodised aluminium work for doors, windows, ventilators and partitions with extruded builtup standard tubular and other sections of approved make conforming to IS: 733 and IS:1285, anodised transparent or dyed to required shade according to IS: 1868. (Minimum anodic coating of grade AC 15), fixed with rawl plugs and screws or with fixing clips or with expansion fasteners including necessary filling up of gaps at junctions at top, bottom and sides with required PVC/neoprene felt, etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, aluminium snap beading for glazing/panelling, CP brass/stainless steel screws, all complete as per architectural drawings and direction of Engineer-in-charge. (Glazing and panelling to be paid for separately).				
(a)	For fixed portion	800	kg		
(b)	For shutters of doors, windows & ventilators including providing and fixing hinges/pivots and fittings wherever required including the cost of PVC/neoprene gasket required.	1500	kg		
76	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions, etc., with PVC/neoprene gasket, etc., complete as per the architectural drawings and directions of Engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item).				
	With glass panes of 5.5mm thickness (weight not less than 13.75kg/sqm)	120	sqm		
77	Providing and fixing double action hydraulic floor spring of approved brand and manufacture (conforming to IS:6315) for aluminium door including cost of cutting floors as required, embedding in floors and cover plates with brass pivot and single piece MS sheet outer box with slide plate etc., complete as per the directions of Engineer-in-charge. (SS cover plate.)	1	each		

78	Providing, laying and fixing roof water proofing treatment using two successive liquid coatings of high solid content urethane pre-polymers to form elastomeric membrane having overall dry film thickness of minimum 1.5mm subject to minimum 750gm/sqm/coat application rate including primer coat consisting of polyurethane or any other equivalent material , finishing coats and surface finish complete laid over cement plaster (1:6) grading. Screed concrete over finished layer of elastomeric membrane cast in panels of 1.2 x 1.2m and reinforced with 0.56mm dia galvanised chicken wire mesh and joints sealed using sealing compound all complete (cement plaster and screed paid seperatly) including all labour, material, equipment, handling, scaffolding, transporting, testing etc. complete as per drawing, specification and instructions of the engineer.	500	sqm		
79	Providing and fixing on wall face unplasticised - Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion. (i) Single socketed pipes of 75mm dia.	100	meter		
80	Providing & fixing in position precast cement concrete trench covers or perforated covers wherever necessary at various elevations in all kinds of work including moulding, formwork, mixing, laying out, compacting and curing, storing, transportation, erection without damage, setting in position with cement and sand mortar, grouting etc all as per specs, drawings and directions of Engr-in-Charge but excluding the cost of reinforcement, inserts, edge angles, etc.				
	Grade of concrete shall be M25	110	cum		
81	Providing and fixing M.S grills of required pattern in frames of windows etc. with M.S flats,square or round bars etc. all complete.	2500	kg		
82	Add or deduct plaster drip course /groove in plastered surface or moulding to RCC projections:	50	meter		

83	Providing and fixing at all height false ceiling including providing and fixing of frame work made of special section power pressed from M.S sheet and galvanised in accordance with zinc coating of grade 350 as per I.S: 277 and consisting of nagle cleats of size 25mm wide x 1.6mm thick with flanges of 22mm and 37mm at 1200mm centre to centre one flange fixed to the ceiling with dash fastener 12.5mm dia x 40mm long with 6mm dia bolts to the angle hanger being fixed with nut and bolts to G.I channels 45x15x0.9mm running at the rate of 1200mm centre to centre to which the ceiling section 0.5mm thick button wedge of 80mm with tapered flanges of 26mm each having clips of 10.5mm at 450mm centre to centre shall be fixed in a direction perpendicular to G.I channel with connecting clips made out of 2.64mm dia x 230mm long G.I wire at every junction including fixing the gypsum board with ceiling section and perimeter channel 0.5mm thick 27mm high having flanges of 20mm and 30mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450mm centre to centre with 25mm long drive-all screws @ 230mm interval including jointing and fixing to a flush finish of tapered and square edges of the board with recommended filler, jointing tapes, finisher and two coats of primer suitable for board as per manufactures specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels				
	suitably fixed all complete as per drawing and specification and direction of the Engineer in Charge but excluding the cost of painting with:				
	12.5mm thick tapered edge gypsum board conforming to IS:2095-Part-I	50	sqm		
84	Providing and fixing thermal insulation of ceiling (under deck insulation) with Resin Bonded Fibre glass wool conforming to IS : 8193 (Twiga Insul 1500/50mm or equivalent) density 24 kg/m ³ , 50 mm thick, wrapped in 200 G Virgin polythene bags fixed to Ceiling with metallic cleats (50x50x3 mm) @ 60cm and wire mesh of 12.5 mm x 24g wire and mesh, for top most ceiling of building .	50	sqm		
85	Providing and fixing (all dia & length) foundation bolts in position with help of proper templates including supply of templates ,nuts and washers all complete as per specs, drawings & directions of Engr-in-Charge	22000	kg		
86	Extra over Item above for providing galvanised bolts (Mass of zinc coating = 610gms/sqm), nuts & washer .	22000	kg		

87	Fixing (all dia & length) foundation bolts in position with help of proper templates(template to be supplied by contractor) all complete as per specs, drawings & directions of Engr-in-Charge.Bolts to be provided by BHEL free of cost.	500	kg		
88	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth,dressing to camber and consolidating with road roller including making good the undulations etc and re-rolling the sub grade and disposal of surplus earth lead upto 50 metres.	1500	sqm		
89	Extra for compaction of earthwork in embankment under optimum moisture conditions to give at least 95% of the maximum dry density (Proctor density)	1500	sqm		
90	Providing and laying compacted 150mm thick layer of moorum shoulder on both sides of road as per direction of Engineer-in -Charge.	800	Sqm		
91	Suppling and stacking at site				
(a)	90 mm to 45 mm size stone aggregate	465	cum		
(b)	63 mm to 45 mm size stone aggregate	300	cum		
(c)	53 mm to 22.5 mm size stone aggregate	150	cum		
(d)	Stone screening 13.2 mm nominal size (type A)	185	cum		
(e)	Stone screening 11.2 mm nominal size (type B)	30	cum		
(f)	moorum	60	cum		
92	Laying WBM with specified size of stone aggregates, screening and moorum/ blinding materials including screening, sorting, spreading to template and consolidation with power road roller of 8 to 10 tonne capacity etc., complete. (Payment will be made for compacted layers only).				

(a)	Subbase with stone aggregate 90mm to 45mm including stone screening 13.2mm size and moorum/blinding material.	345	cum		
(b)	Base course with stone aggregate 63mm to 45mm including stone screening 13.2mm size and moorum/blinding material.	225	cum		
(c)	Base course with stone aggregate 53mm to 22.4 mm including stone screening 11.2mm size and moorum/blinding material.	110	cum		
93	Providing and laying Bitumen Penetration Macadam with hard stone aggregate of quality, size and grading as specified, with bitumen of suitable penetration grade including required key aggregate as specified, spreading coarse aggregate with the help of self propelled/ tipper tail mounted aggregate spreader and applying bitumen by a pressure distributor and then spreading key aggregate with the help of aggregate spreader complete including consolidation with road roller of minimum 8 to 10 tonne capacity to achieve specified values of compaction and surface accuracy:				
	For 50mm compacted thickness using coarse aggregate of size 50-20mm graded @ 0.60 cum per 10 sqm key aggregate of size 12.5mm graded @ 0.15 cum per 10sqm. With paving asphalt 80/100 @ 50 kg/10sqm	1500	sqm		
94	Providing and laying 2 cm thick premix carpet surfacing with 2.4 cum of stone chippings 11.2mm nominal size per 100sqm and bitumen emulsion (medium setting min. 65% bitumen content) complying with IS: 8887-1995 using 96 kg per cum of chipping including consolidation with road roller of 6 to 9 tonne capacity etc. complete (tack coat to be paid for separately)	1500	sqm		
95	Providing and laying seal coat of premixed fine aggregate (passing 2.36 mm and retained on 180 micron sieve) with bitumen using 128 kg of bitumen of grade 80/100 bitumen per cum of fine aggregate and 0.60 cum of fine aggregate per 100 sqm of road surface including rolling and finishing with road roller all complete.	1500	sqm		

96	Providing and fixing at or near ground or alongsides of road etc. precast cement concrete in kerb stone, edging etc. as per approved pattern and setting in position with cement mortar 1 : 3 (1 Cement : 3 coarse sand) including the cost of required centring, shuttering and finishing smooth with 6mm thick cement plaster 1:3(1 cement:3 fine sand) on exposed surface complete.				
	1:2:4 (1 cement:2 coarse sand:4 graded stone aggregate 20mm nominal size)	22	cum		
97	Providing and laying non-pressure NP2 class (light duty) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc., complete.				
(a)	100mm dia. RCC pipe	5	RM		
(b)	150mm dia. RCC pipe	5	RM		
(c)	250mm dia. RCC pipe	5	RM		
(d)	300mm dia. RCC pipe	5	RM		
(e)	450mm dia. RCC pipe	5	RM		
98	Providing and laying non-pressure NP3 class (light duty) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc., complete.				
(a)	250mm dia. RCC pipe	5	RM		
(b)	300mm dia. RCC pipe	5	RM		
(c)	450mm dia. RCC pipe	5	RM		
99	Providing and placing in position suitable PVC water stops conforming to IS 12200 or equivalent for construction/expansion joints between two RCC members and fixed to the reinforcement with binding wire before pouring concrete etc. complete.				
	Serrated with central bulb(225mm wide,8-11mm thick)	60	meter		
100	Providing and laying stone aggregate in switch yard areas in 75mm thick layer using 40 mm aggregates size on top and 75mm thick layer using 20mm size aggregate below making overall thickness of stone aggregate as 150mm . Before laying the stone aggregates , the yard surface shall be treated with antiweed treatment all complete as per direction of Engineer in Charge. (The rate shall be inclusive of all materials ,labour,loading,unloading and surface preparation etc. required for aggregate laying and antiweed treatment)	12000	sqm		

101	Providing and fixing 2.4meter high GI chain link fencing with 0.6m high barbed wire including all allied activities, all complete as per attached drawing and direction of Engineer -in -charge .(Rates shall be inclusive of all items like angles,pipes, chainlink fence, barbed wire, toe wall ,PCC, etc all complete as per drawing).	430	RM		
102	Grouting of block outs, pockets, foundations, bolts holes and underside of base plates with cement, sand aggregate (of size 6 mm and down) grout 1:1:2 with non-shrink additive and shall be of strength not less than M30 including placing, curing, cleaning, surface preparation, testing, etc. complete with labour, materials, equipment, handling, testing, etc. all complete as per specifications, drawings and instructions of the Engineer.	5	cum		
103	Providing, driving and installing driven cast-in-situ reinforced cement concrete pile of specified diameter and length below the pile cap M30 in cement concrete, to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of shoe and the length of pile to be embedded in the pile cap etc. all complete, (Length of pile for payment shall be measured from top of shoe to the bottom of pile cap).				
(a)	550mm dia piles	5800	meter		
104	Vertical load testing of pile in accordance with IS 2911 (Part IV) including installation of loading platform and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of Engineer in-charge.				
	Single pile upto 50 tonne capacity				
	Initial test	1	per test		
	Routine test	1	per test		

105	Lateral load testing of single pile in accordance with IS Code of practice IS:2911 (Part IV) for determining safe lateral load on pile:				
	Upto 50 tonne capacity pile.	1	per test		
106	Low strain integrity test on pile- 500 mm dia and 140 Ton capacity	50	per test		
107	Stripping pile head to cut off level and exposing pile reinforcement for embedment in pile cap including cleaning, brushing, disposing the material all complete as per direction of Engineer-in-charge.	90	cum		

Note

1 Reinforcement steel shall be supplied by BHEL free of cost as per norms indicated in conditions of contract. The rate quoted against Item No: 18(a) above shall be deemed to be inclusive of cost against all activities required including transportation of material from stockyard.

2 Cement and structural steel shall be supplied by BHEL free of Cost from BHEL Store within the project area.