

<p style="text-align: center;">SCHEDULE OF QUANTITIES (SOQ) / BILL OF QUANTITIES (BOQ) FOR CONSTRUCTION OF CIVIL, ARCHITECTURAL AND STRUCTURAL WORKS FOR COOLING TOWER WORKS (Bearing & Condenser) AT 2 X 12MW EXPANSION POWER PLANT FINCHAA SUGAR FACTORY (FSF) STATE- ORAMIA. (ETHIOPIA)</p>						
SL NO	DESCRIPTION	UNIT	QUANTITY	RATE IN ETHIOPIAN BIRR IN FIG	RATE IN ETHIOPIAN BIRR IN WORDS	AMOUNT IN BIRR (IE RATE X QUNATITY)
	Part - A : CIVIL , STRUCTURAL & ARCHITECTURAL WORK					
	All the item description shall be read in conjunction with Customer specification attached with the tender document . No extra payment shall be made on account of interpretation of item in isolation. All items shall be goverend by British Standard or Ethiopian Standard. In case of conflict between the two standard Ethiopian Standard shall prevail. It is the responsibility of bidders to arrange British Standard / Ethiopian Standard for thier reference before quoting for this job. No claim shall be entertained by BHEL at later date for not having knowledge of relevant codes for different items of work.					
1.0	EXCAVATION					
1.1	Earthwork in excavation in all kinds of ordinary and hard soil (including slushy soil) up to a depth of 2.0 m below ground level and stacking within a lead of 100 m,with necessary shoring, strutting, trimming and dressing of sides etc., including bailing / pumping out of surface water/rain water/sub soil water, clearing of all shrubs,weeds,grass and cutting minor vegetation including roots, if any, complete as per drawings and specifications.					
a)	All kinds of soil (Ordinary and hard soil)	CU. M.	1,250			
1	Same as Item no-1.1 above but from 2.0 m – 4.5 m depth					
a)	All kinds of soil (Ordinary and hard soil)	CU. M.	1,363			
b)	Same as item 1.1 above, but for soft rock/hard rock/sheet rock requiring chiselling / blasting.	CU. M.	200			
2.0	BACKFILLING :					
2.1	Earthwork in backfilling & compacting in layers not exceeding 150 mm , around foundations, trenches , below grade slabs and all other locations ,each layer shall be watered and thoroughly consolidated with roller/mechanical compactor. At location where rolling is not possible each layer rammed with heavy rammer, clods or rocks over 200mm size shall be placed in upper 150 mm portion of the fill as per specs, drawings and as directed by the Engineer.					
a)	With earth (generated from excavation) obtained from stacks within a lead of 100m	CU. M.	2,150			
3.0	CONCRETE					
3.1	Supplying, laying in position, compacting and curing as per specification Plain cement concrete (using OPC-grade-53) of the following mix with 20mm down size aggregates below GL and up to 1.0M above GL , including consolidation of subgrade wherever required.					

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b)	1:4:8	CU. M.	125			
3.2	Supplying, laying in position, curing as per specifications Controlled concrete (using OPC grade-53) of the following grades (graded coarse aggregates of 40mm down, 20mm down 12mm down shall be used wherever applicable). The temperature of concrete should not exceed 23Deg.C at the time of pouring. Only RMC (Ready mix concrete generated from automatic concrete batching plant shall be used)					
a)	for all depths below GL and 1.0 m above GL					
iii)	Grade M-35 for foundations, slabs, columns, floors, beams etc with minimum cement content of 320 kg/m3	CU. M.	500			
b)	for all elevations 1m above G.L.					
iii)	Grade M-35 for with minimum cement content of 380 kg/m ³ of concrete for STG top deck/columns above raft at all levels including addition of suitable plastisizers conforming to relevant BS/ES code to achieve required strength in concrete as per manufacturers recommendations, preparation of scheme for concreting, getting it approved by engineer.	CU. M.	1,050			
iv.	Precast Columns & Beams M35 for all levels	CU.M	200			
3.9 (a)	Supplying and installing ribbed PVC water stops 6mm thick and 150mm wide in cement concrete including laps by fixing / vulcanizing joints and folds as applicable etc. all complete as per spec. and approved by the Engineer.PVC water stopper shall be coated on either side with hot asphalt. The longitudinal joints in water stops shall preferably be hot welded or overlapped at least 200mm	RM	225			
3.9 (b)	Supplying and installing ribbed PVC water stops 6mm thick and 225mm wide in cement concrete including laps by fixing / vulcanizing joints and folds as applicable etc. all complete as per spec. and approved by the Engineer.PVC water stopper shall be coated on either side with hot asphalt. The longitudinal joints in water stops shall preferably be hot welded or overlapped at least 200mm.	RM	225			
3.11	Grouting under equipment bases as required, curing and finishing the exposed surfaces including all materials, form work etc. as per drawings and directions of the Engineer.					
a)	With 1:1:2 cement sand and 6mm down stone chips with 28 days minimum cube strength of 25 N/mm2	CU. M.	0.750			
4.0	FORM WORK					

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4.1	Supplying, installing, dismantling and removing the following classes 'of formwork as per drawings and specifications at all levels using steel / plywood wood shuttering. The surface of shuttering coming in contact with construction shall have plastic coating of approval make. Formwork shall be rigidly constructed of boards as per Ethiopian building code standard /British standard. The tolerances of shuttering at any time will be as set forth in ES/BS code.					
b)	Curved in plan	SQ.M.	600			
c)	Fairface formwork for columns and top deck of STG above raft.	SQ.M.	9,250			
d)	Drift eliminator columns + columns above FGL	SQ.M.	2,000			
4.2	Providing Pockets in concrete of sectional area less than 0.1 sq.m in plan by fixing and removing formwork for anchor bolts , pipe sleeves etc. as per drgs including. all materials ,labour etc. complete as per drawings and specifications.					
	a) Up to 300 mm TO 600 mm deep					
	i)For HW distribution nozzles	Nos.	3,810			
	ii)For Gearbox foundation bolts	Nos.	16			
	iii)For Motor foundation bolts	Nos.	16			
	iv)For Sluice Gate fixing (both at wall as well as slab)	Nos.	44			
	v)For Drain and Overflow puddle pipes	Nos.	8			
5.0	REINFORCEMENT,					
5.1	Supplying, bending, binding, transporting and placing in position following types of High Yield Strength Deformed (HYSD) bars reinforcement of grade conforming to Ethiopian building code standard /British standard of all diameters and at all elevations using approved quality binding wires as per specifications and drawings.All bars are to be lapped by 50 x dia of bar and not more than 33% of the bar shall have lapped joints at same location. Quoted rate shall be inclusive of laboratory test of reinforcement bars as per requirement of BHEL/Customer					

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	b) HYSD reinforcement	M.T.	225			
6.0	STRUCTURAL STEEL: Steel products shall comply with the requirement of BS 4360 and BS 6363 (Black steel to be primed during fabrication and surface treated after installation. Hot dip galvanized steel shall comply with the requirement of BS 729). Structural use of steel in building shall comply with BS5950 or equivalent. Fabrication , Erection and approval of steel structures shall be in compliance with Ethiopian Building code standard/ British standard. Fabrication shall be in accordance with the requirement of BS 5950 standard.					
6.1	Supplying, fabricating using approved quality electrodes as per BS standard, preheating, packing and delivering at site of the following categories of Structural steel works including cost of steel, all necessary bolts, nuts and washers with a shop coat of primer compatible with final paint system-complete as per drawings and specifications.					
c)	Steel work consisting of purlins, non plated beams , bracings, sag rods with anchor cleats / end plates	M.T.	3.5			
6.3	Supplying, fabricating and fixing in positions MS inserts like channels, angles, flats, rounds, plates, pipe sleeves and any other structural shape etc. including cost of steel , necessary templates / stagings, cutting to required lengths, bolting revetting welding, painting etc. as required all complete as per drawings and specifications.	M.T.	10.50			
6.7	Supplying, fabricating, fixing in position 32NB MS pipe handrails at various elevation including cost of materials, consumables, labour, painting with synthetic enamel paint etc. all complete as per drawing and specifications.	R.M.	625			
6.11	Supplying, fabricating and fixing in positions Seismic Arrestor inserts made up of pipes, channels, angles, flats, rounds, plates, pipe sleeves and any other structural shape etc. including cost of steel, necessary templates / stagings, cutting to required lengths, machining of top surfaces, bolting revetting welding etc. as required all complete as per drawing No:-3-38144-00036 and specifications.	M.T.	0.2			
7.0	MASONRY & ALLIED WORKS,					
	Rubble stone masonry in cement mortar 1:6 in foundations, basement and super structure as per specifications (Using OPC grade-53 cement). Sized stones shall be of hard granite ,basalt or trap stone obtainable from approved quarry. Bond or through stone shall be provided not exceeding 2m apart in each course and shall be staggered, bond stone shall be from front to back of the walls. Chips ,spalls shall be used to avoid thick mortar joints and shall not exceed 10% of the quantity of stone masonry .Rough dressed stone shall be built in sizes not less than 300mm high per course and 400mm wide per stone. The joinery shall be raked out to a depth of approximately 15mm as the work proceeds and prepared for painting.					
7.5	Supplying and laying damp proof course 40mm thick with plain concrete (1:1 ¹ / ₂ : 3) nominal mix by volume with 12mm down size aggregates and minimum 3% admixture of water proofing compound with all materials complete as per specifications.	CU.M.	20			

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7.6	Providing 12mm thick cement-sand (1:6) plastering to the interior faces of the walls & RCC columns coming in line with side of the wall at various elevations including mixing, laying , finishing,curing, rounding corners, cutting grooves, wherever required, etc. with all materials complete as per drawings and specifications. (Using OPC grade-53 cement).	SQ. M	1,405			
7.7	Providing 18mm thick cement-sand (1:6) plastering to the exterior faces of the walls & RCC columns coming in line with side of the wall at various elevations including mixing, laying , finishing,curing, rounding corners, cutting grooves, wherever required, etc. with all materials complete as per drawings and specifications. (using OPC grade-53)	SQ. M	1,405			
7.8	Providing water proof cement plaster 1:3 mix with suitable proportion of an integral water proofing compound in two coats.the first coat being 12 mm thick and 2nd coat of 10 mm thick with hexagonal netting of 0.63 mm dia at various elevations including mixing, laying , finishing,curing, rounding corners, cutting grooves, wherever required, etc. with all materials complete as per drawings and specifications as directed by Engineer (using OPC grade-53).	SQ. M	1,350			
18.0	MISCELLANEOUS ITEMS					
18.7	Supplying and mixing approved equivalent brand of conplast plasticizer in cement concrete/cement mortar etc.all complete as per drawings and specifications.	Ltr	2,200			
	TOTAL AMOUNT IN BIRR					
	RATE IN WORDS (BIRR.....)					