

**TENDER NO. BHEL: NR :SCT: TISHREEN: CIVIL - II: 770**

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## **TENDER SPECIFICATIONS**

**TENDER NO. BHEL: NR : SCT: TISHREEN: CIVIL - II: 770**

**FOR**

**“Construction of RCC Chimney with Electrical works and Complete Fabrication, Erection, Painting & Grouting of Structural Steel works in Main Power House consisting of Turbine Bay, Electrical/Control Room Bay & Pipe Racks for 2 x 200 MW Tishreen Power Plant Extension Project, Tishreen, Syria.”**

**PART II – PRICE BID**



**Bharat Heavy Electricals Limited**  
(A Govt. Of India Undertaking)  
**Power Sector – Northren Region,**  
Plot No. 25 , Sector - 16A ,  
Distt. Gautam Budh Nagar, NOIDA – 201 301 (INDIA)

**TENDER NO. BHEL: NR :SCT: TISHREEN: CIVIL - II: 770**



ISO 9001, ISO 14001 and  
OHSAS 18001 certified  
company  
SubContract and Purchase  
Deptt.

**Bharat Heavy Electricals Limited**  
(A Govt. Of India Undertaking)  
**Power Sector – Northern Region,**  
**Plot No. 25 , Sector - 16A ,**  
**Distt. Gautam Budh Nagar, NOIDA – 201 301.INDIA**  
**Phone: 0091-0120- 2416279 / 2416251**  
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THIS TENDER SPECIFICATION ISSUED TO:

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## RATE SCHEDULE CUM BOQ

2x200 MW TISHREEN TPPE		SPECIFICATION NUMBER				
PEEGT, MINISTRY OF ELECTRICITY, REPUBLIC OF SYRIA		BILL OF QUANTITIES		PE-BQ-323-600 C001	REVISION 02	
SL. NO	DESCRIPTION	UNIT	TOTAL QTY	RATE		REMARKS
				In figures	In words	
<b>PART A</b>						
<b>RCC CHIMNEY CIVIL WORKS</b>						
100	EARTH WORK IN EXCAVATION, BACKFILLING AND DISPOSAL INCLUDING NECESSARY MEN/WOMEN, MATERIALS, EQUIPMENT, LOADING, TRANSPORTATION, UNLOADING, DEWATERING ETC AS PER SPECIFICATION, DRAWINGS AS PER RELEVANT SYRIAN/BS STANDARDS/SPECIFICATIONS APPROVED BY PEEGT/BHEL 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 (wherever required), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 500 m, spreading/levelling of disposed materials etc all complete for following depths below ground level. (The payment for excavation under subheads below shall be made for the quantities excavated in that subhead only and each subhead includes lift upto ground level):					
a	Depth from ground level but not exceeding 2 m	CUM	2520			
b	Depth exceeding 2 m but not exceeding 4 m	CUM	2042			
c	Depth exceeding 4 m but not exceeding 6 m	CUM	1624			
d	Depth exceeding 6 m but not exceeding 8 m	CUM	322			
102	Earth work in excavation in soft rock (rock without any recovery of excavated 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 including setting out, levelling, dewatering (wherever required), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming/compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 500 m, spreading / levelling of disposed materials etc all complete for following depths below ground level. (The payment for excavation under subheads below shall be made for the quantities excavated in that subhead only and each subhead includes lift upto ground level):					
a	Depth from ground level but not exceeding 2 m	CUM	10			
b	Depth exceeding 2 m but not exceeding 4 m	CUM	10			
c	Depth exceeding 4 m but not exceeding 6 m	CUM	10			
d	Depth exceeding 6 m but not exceeding 8 m	CUM	250			
103	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with selected materials from compulsorily excavated soil available within a lead upto 500m and compacted as specified including re-excavation of stacked earth, watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following.					
a	Each layer compacted so as to achieve at least 95% maximum dry density as per relevant Syrian/BS Standards and/or approved by PEEGT/BHEL.	CUM	200			
104	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with selected materials directly from excavation and compacted as specified including watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following.					
a	Each layer compacted so as to achieve at least 95% maximum dry density as per relevant Syrian/BS Standards and/or approved by PEEGT/BHEL.	CUM	241			
105	Extra over ST No. 101 to 103 for carriage of excavated earth/selected materials for every 1 km or part thereof beyond an initial lead of 500m.	CUM	500			
106	Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm thickness using/with approved borrowed soil (borrowed soil to be arranged by the bidder) and compacted as specified including supplying borrowed soil, royalty (if any), watering, ramming/compaction by manual/mechanical means, dressing etc all complete for the following.					
a	Each layer compacted so as to achieve at least 95% maximum dry density as per relevant Syrian/BS Standards and/or approved by PEEGT/BHEL.	CUM	3000			
107	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 relevant Syrian/BS Standards and/or approved by PEEGT/BHEL including spreading, watering, ramming/compaction by manual / mechanical means, dressing, royalty (if any) etc. all complete.	CUM	25			
108	Filling in trenches, plinths, area paving and other underground structures with stone (63 mm down graded), in layers not exceeding 200 mm thickness including breaking of boulders to required sizes, filling the interstices with selected sand and compacting to 85 % of original volume of stone stack for all lifts all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	CUM	750			
200	PROVIDING AND PLACING CONCRETE WORK INCLUDING 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, PREPARATION OF SCHEME FOR CONCRETING, GETTING IT APPROVED BY ENGINEER, MAINTAINING AND SUBMITTING RECORDS OF CONCRETING (EXCLUDING COST OF CENTERING, SHUTTERING, CHEMICAL/MEMBRANE CURING AND REINFORCEMENT) ETC. COMPLETE AS PER DRAWINGS, SPECIFICATIONS, MANUFACTURER'S RECOMMENDATIONS, RELEVANT SYRIAN/EQUIVALENT BS STANDARDS AND AS APPROVED BY PEEGT/BHEL FOR THE FOLLOWING:					
201	Providing and laying cement concrete of grade M10 (150mm Cube strength at 28 days) of standard mix 1:3:6 (1Cement: 3Sand: 6Coarse Aggregate) with moderate sulphate resisting cement (as per Syrian standard or BS standard of approved make & quantity), coarse sand and graded hard stone aggregate of 40 mm nominal size as PCC/lean concrete below Foundations/Plinth Beams, mud mat under foundation/floor/grade slab, etc at any level below finished floor level, any shape, position or thickness etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/ equivalent BS standards and/or as approved by PEEGT/BHEL.	CUM	90			

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			In figures	In figures	In words	IN EUROS	
202	Providing and laying cement concrete of <b>grade M20 (150mm Cube strength at 28 days) of standard mix 1:1.5:3 (1Cement: 1.5Sand: 3Coarse Aggregate)</b> with moderate sulphate resisting cement (as per Syrian standard or BS standard of approved make & quantity) for reinforced concrete works with coarse sand and graded hard stone aggregate of 40 mm nominal size as <b>grade slabs, cable trenches, tunnels, under floors, paving, pipe encasing etc.</b> at any level above/below finished floor level, any shape, position or thickness etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/ equivalent BS standards and/or as approved by PEEGT/BHEL.	CUM	25				
203	<b>Providing and laying Design Mix cement concrete</b> of following grades with moderate sulphate resisting cement (as per Syrian standard or BS standard of approved make & quantity) for reinforced concrete works with coarse sand and graded hard stone aggregate of 20mm nominal size in foundations/substructure/superstructure, grade slab, under floors etc as mentioned below at any level, any shape, position or thickness etc complete including use of plasticizer/ superplasticizer of approved make conforming to relevant BS standard to achieve required slump in concrete all complete as per specification & drawing and as approved by PEEGT/BHEL.						
	i) For all works below ground level (except chimney shell)						
	a) grade M25 (150mm Cube strength at 28 days) as per Syrian code or C20/25 as per BS8500 (foundations, etc)	CUM	1100				
	ii) For all other works						
	a) grade M30 (150mm Cube strength at 28 days) as per Syrian code or C25/30 as per BS8500 for chimney shell, corbels and external platforms and other shell attachments.	CUM	2900				
	b) grade M35 (150mm Cube strength at 28 days) as per Syrian code or C30/37 as per BS8500 for chimney shell, corbels and external platforms and other shell attachments.	CUM	50				
	c) grade M25 (150mm Cube strength at 28 days) as per Syrian code or C20/25 as per BS8500 for all other components of the super structure, roof slab, mini -shells, beams, columns wall etc.	CUM	40				
204	Supplying, fixing & removing <b>fairface plywood form work</b> with good quality water proof ply wood of required thickness and smooth surface below finished ground floor level for foundations, footings, base of columns, walls, columns, pilasters, beams, mass concrete, trenches etc. complete for exposed concrete works etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	50				
205	Supplying, fixing & removing <b>fairface steel form work below finished ground floor level</b> for foundations, footings, base of columns, walls, columns, pilasters, beams, mass concrete, trenches etc. complete for exposed concrete works etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	300				
206	Providing and fixing formwork of approved quality for cast-in-situ, plain or reinforced concrete works of any type and section (including curved surfaces and chimney shell) for all elevations, including labour, materials, equipment, waste of forms, shoring, strutting, scaffolding, staging, tying, nailing, caulking, bolting etc. and removal of form work and staging etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.						
	a) Inner and outer faces of wind shield with slip form shuttering	SQM	13250				
	b) Fairface plywood form work with good quality water proof ply wood of required thickness and smooth surface for all other components of the superstructure including slabs, beams, columns, walls, enclosures, mini shells, external platforms, corbels, other shell attachments, chases/recesses in shell etc.	SQM	150				
207	Providing and fixing formwork in shell openings (above 0.1 sq.m surface area) including cutting, formation of shapes and all other operations required for making the required shape and size, removal of formwork, all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	175				
208	Providing and placing in position at all levels, building paper (kraft paper), between concrete surfaces including the cost of labour, material, etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	5				
300	<b>PROVIDING, STRAIGHTENING CUTTING, BENDING, PLACING IN POSITION AT ANY LEVEL, BINDING OF STEEL REINFORCEMENTS AND BINDING WIRE, LABOUR ETC. COMPLETE AS PER DRAWINGS, SPECIFICATIONS, RELEVANT SYRIAN/BS STANDARDS AND/OR AS APPROVED BY PEEGT/BHEL FOR THE FOLLOWING:</b>						
301	Providing, straightening cutting, bending, placing in position at any level, binding of <b>mild steel reinforcements of diameter upto 12 mm</b> of grade 250 as per BS:4482 in <b>concrete</b> including cost of reinforcement and binding wire, labour, scaffolding, transportation to & from stores etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	MT	15				
302	Providing, straightening, cutting, bending, placing at any level, binding in position <b>high yield strength steel reinforcements of grade B500B as per BS:4449 of diameter upto 32mm</b> in <b>concrete</b> including cost of reinforcement and binding wire, labour, scaffolding, transportation to & from stores etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	MT	434				
500	<b>SUPPLYING, INSTALLATION, FILLING IN POSITIONS ETC. OF JOINT FILLER AND SEALING COMPOUND INCLUDING LABOUR, MATERIAL, EQUIPMENTS ETC. ALL COMPLETE AS PER DRAWINGS, SPECIFICATIONS, MANUFACTURER'S RECOMMENDATIONS, RELEVANT SYRIAN/BS STANDARDS AND/OR AS APPROVED BY PEEGT/BHEL UNLESS SPECIFIED OTHERWISE FOR THE FOLLOWING:</b>						
501	<b>Bitumin impregnated fibre board</b> as joint filler at joints in concrete including nailing, coating of both faces with coal tar pitch/bitumin etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.						
	i) 12mm thick joints.	SQM	25				
502	Hot applied <b>bitumin sealing compound</b> (Grade A) including cleaning, mixing, heating, pouring/injecting sealing compound in gaps in joints at all levels including application of primer etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	Kg	25				
503	<b>Providing and applying two coats of bitumen grade 85/25</b> ( @ 1.7kg/sqm) with 1% antistripping compound in foundation, shell, pedestal etc on concrete surfaces exposed to soil / ash including surface preparation etc. all complete as per specifications, manufacturer's recommendations, relevant Syrian/ equivalent BS standards and/or as approved by PEEGT/BHEL and as directed by engineer- in-charge.	SQM	900				

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600	<b>PROVIDING AND GROUTING OF STRUCTURES INCLUDING COST OF MATERIALS, LABOUR AND EQUIPMENT FOR HANDLING, TESTING, PERFORMING RELEVANT OPERATIONS, ETC. COMPLETE AS PER DRAWINGS, SPECIFICATIONS, MANUFACTURER'S RECOMMENDATIONS, RELEVANT SYRIAN/BS STANDARDS AND/OR AS APPROVED BY PEEGT/BHEL UNLESS SPECIFIED OTHERWISE FOR THE FOLLOWING:</b>						
601	Providing & grouting with <b>cement slurry mix</b> of approved ratio using <b>pressure pump</b> for water retaining concrete structures as per approved procedure including cost of nipples/ nozzles, cement, admixture, curing, pressure pumps, slurry agitator etc. all complete. Cost shall include fixing of nipples at minimum 500 mm centre to centre spacing, cutting of nipples after completing of grouting, making good of the nipple hole with appropriate non-shrink cement paste, water tightness test etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	22				
602	Providing & grouting of pocket holes, pipe sleeves under base plates, machinery, pipe supporting structures etc. with <b>mix 1:1 (1 cement :1 sand )</b> using non shrink admixture etc. all Complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	CUM	20				
603	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 <b>mix 1:1:2 (1 cement : 1 coarse sand : 2 aggregate of 6 mm down graded stonechips )</b> using non shrink admixture etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL. (Cost of all material and cleaning the pocket by compressed air shall be in the scope of the contractor).	CUM	9				
604	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 <b>Conbextra GP-1 or equivalent</b> as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM	32				
605	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 <b>Conbextra GP-2 or equivalent</b> as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM	24				
700	<b>FLOOR, WALL &amp; CEILING FINISHES, DADO AND SKIRTING INCLUDING ALL MATERIALS, LABOUR, CURING, POLISHING, FINISHING, EXPANSION JOINTS, GROOVES, ETC. COMPLETE IN ALL RESPECTS AS PER DRAWINGS, SPECIFICATIONS, MANUFACTURER'S RECOMMENDATIONS, RELEVANT SYRIAN/BS STANDARDS AND/OR AS APPROVED BY PEEGT/BHEL UNLESS SPECIFIED OTHERWISE FOR THE FOLLOWING:</b>						
701	Providing and laying 50 mm thick <b>heavy duty cement concrete in flooring</b> with <b>metallic hardener pigmented topping</b> 12mm thick uniform graded treated iron paricles in flooring. Under layer of 38mm thick cement concrete mix 1:2:4 (1 cement : 2 sand : 4 stone aggregates 12.5mm well graded) and top layer of 12mm thick metallic concrete of mix 1:2 (1 cement hardner mix with approved quality metallic hardening compound :2 stone aggregate 6mm nominal size) by volume including cement slurry, rounding off edges etc. all complete as per drawings, specifications, manufacturer's recommendations, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	150				
801	Preparing detailed fabrication drawings and after approval by the Engineer, supplying, fabricating, erecting and installing miscellaneous steel parts to be embedded/cast in concrete (like staircase embedments, corbel face plates, etc) at all positions and levels including the cost of all labour, materials and equipments for setting materials in concrete, grouting, welding, bolts & bolting, expansion anchors, drilling, cutting, etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	MT	3				
802	Preparing detailed fabrication drawings after approval by the Engineer, <del>providing</del> , fabricating and erecting <b>structural steel work for the stair case</b> (from grade level to roof level), <b>internal platforms, walkway gallery structures, chequered plate panels</b> (for floors of internal and external platforms), <b>trusses and landings of the staircase</b> including brackets, kick plates, structural members, beam support bearings on the shell, stiffeners, seats, blockouts, ready to bolt fixtures, cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, welding to cast in fixing place, cutting, grinding, drilling, bolts and bolting, anchor fasteners, welding, preheating and post heating for welding, testing, primer and finish painting etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	MT	145				
803	Supplying, fabrication, erection and alignment of factory made <b>galvanised welded grating units</b> with mild steel in platforms, staircases with edge binding strips and anti-skid nosing in treads etc. including 2 coats of redoxide zinc-chromate primer (one coat at shop and one coat after erection), fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	MT	21				
804	Preparing detailed fabrication drawings and after approval by the Engineer, <del>providing</del> , fabricating and erecting, at all levels, structural steel flues (liners) complete with all bends, flanges, stiffeners, all other flue attachments, support system, collars, access manholes and gas sampling ports alongwith gaskets and other accessories, staying system, including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drillings, bending, bolts and bolting, welding, preheating and post-heating for welding, testing, etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	MT	295				
805	Providing, fabricating and installing at various locations and elevations of the chimney system the following miscellaneous mild steel items complete with the cost of all labour, material and equipment, transporting, lifting, setting in place, cutting, grinding, drilling, welding, bolts and bolting, anchor fasteners and anchoring, priming, painting, grouting etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.						
	a) Mild steel ladders with cage, hood access hatch, louvers, bird screens, hood drain basin covers and other miscellaneous mild steel items not specifically mentioned.	MT	4				
	b) 32/40 mm nominal bore medium class tubular hand railing for stair case and internal and external platforms	MT	4				
	c) Providing minimum 275 gsm Hot dipped galvanisation on mild steel parts as per specification	MT	2				

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806	Preparing detailed fabrication drawings after approval by the Engineer, providing, fabricating and erecting, at all levels, mild steel strakes complete with all stiffeners, attachments, fasteners, pipe sleeves, etc. including the cost of all labour, material and equipment, transporting, lifting to all heights, setting in place, embedding components in concrete, fixing to cast-in embedments, cutting, grinding, drilling, bolts and bolting, welding, preheating and post heating for welding, testing, grouting, primer and finish painting of exposed components, etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	MT	5				
807	Supplying, fabricating and installing in the liners, gas sampling and gas opacity measurement ports made from SS grade 316L pipe including the cost of all labour, materials, bolts and bolting, asbestos gaskets, cover plates & all other accessories, painting etc.all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	EACH	8				
808	Preparing detailed fabrication drawings after approval by the Engineer, providing, fabricating and erecting, at all levels SS Mini Shell at roof shell of grade A316L, etc. complete as per drawing and specifications.	MT	18				
809	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and installing at all levels, stainless plates (including stainless steel screws and fasteners) of grade AISI 316L and lead sheets beams and over the mild steel in the platform beam bearing, flue supports bearings, flue restrains brackets/ buffers etc. including the cost of all labour material & equipment, transporting, lifting to all heights, setting in place, cutting, grinding, drilling, welding of stainless steel using compatible & approved stainless steel electrodes, testing & machining flat and polishing the contact surfaces of stainless steel, coating the polished surfaces with silicone grease, etc., complete as per drawings and specifications.						
	(a) Stainless steel components	MT	1				
	(b) Lead Sheets	Kg	65				
810	Preparing detailed fabrication drawings and after approval by the Engineer, providing, fabricating and installing expansion compensator joints including bolster in the flue liner including all labour, material and equipment transporting, hoisting, fixing in position, drilling, cutting, bolts and bolting, etc. along with the user handbooks (giving details of installation, dismantling and maintenance procedures for the expansion joints), testing, etc complete as per drawings and specifications.	SQM	25				
811	Supplying "Fabricated Ready to Install" spare expansion compensators alongwith bolster including the cost of all labour, material and equipment, accessories, transporting, proper packaging (for several years of storage), and delivery to site store all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	12				
812	Supplying and laying vermiculite concrete in the liner basin including the cost of all labour, material and equipment for handling, transporting, mixing, lifting, placing, curing, finishing of surface etc. complete as per drawings and specifications	CU.M	5				
813	Providing and installing, at all levels, <b>resin bonded glass wool</b> insulation slabs of density not less than 64 kg/m <sup>3</sup> with an installed thickness of not less than 100 mm, on the outside surface of steel flue liners, on the outside surface of brick liner, on the inside surface of concrete windshield, inside surface of concrete minishells, under the cast iron caps and wherever as directed by the Engineer, in two layers (each 50 mm thick) including the cost of all labour, material and equipment, transporting, lifting to all heights, etc., inclusive of plated or galvanised accessories such as pins/studs/anchors/wire netting, speed washers, tying wires, etc. welding of pins/studs to steel surfaces or embedding of pins/studs/anchors in concrete surfaces, fixing, cutting, cutting, lapping, binding, testing, etc. complete as per drawings and specifications.	Sq.M	1100				
814	Providing and packing, at all levels, <b>loose glass wool</b> insulation to a density not less than 64 kg/m <sup>3</sup> between the insulated minishells and brick liners at expan joints between the lining segments and wherever as directed by the Engineer including the cost of all labour, material and equipment, filling, ramming, testing, etc. complete as per drawings and specifications.	CuM	40				
815	Providing and packing, at all levels, <b>loose rock wool</b> insulation to a density not less than 100 kg/cu.m between the insulated minishells and brick liners at expanjoints between the lining segments and wherever as directed by the Engineer including the cost of all labour, material and equipment, filling, ramming, testing, etc. complete as per drawings and specifications.	CuM	40				
816	Providing and painting, at all levels, inside surface of chimney shell, inside and outside surfaces of minishells, underside of roof slab and other concrete components/surfaces of the chimney as indicated in the drawings and wherever as directed by the Engineer, with acid and heat resisting black bituminous paint in as many number of coats (not less than four coats in any case) as required to give a paint DFT of not less than 150 microns including the cost of all labour, materials, equipment, surface preparation, primer and finish painting, protecting, cleaning etc. all complete as per drawings, specifications, relevant Syrian/BS standards and/or as approved by PEEGT/BHEL.	SQM	2500				
817	Providing and painting, at all levels, the external surfaces of chimney shell and wherever as directed by the Engineer, with cement based paint in alternate bands of colours 'signal red' and 'pure/bright white including the cost of all labours, material and & equipment,surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specification	SQ.M	9500				
818	Providing and painting, at all levels, the external surfaces of chimney shell and wherever as directed by the Engineer, with acid and heat resistant polyurethane paint in alternate bands of colours 'signal red' and 'pure/bright white including the cost of all labours, material and " & equipment surface preparation, primer and finish painting, protecting, cleaning etc. complete as per drawings and specification	SQ.M	1835				
819	Proving and laying over the chimney roof, a composite acid and heat protection treatment including providing of slopes for roof drainage including the cost of all labour, material and equipment, etc., complete as required for preparing the roof concrete, laying under bed of plain cement concrete screed to slopes, preparation of screed surface for painting, painting the screed surface with black bituminous paint, applying bitumenmastic in layers, laying acid resisting(A/R) mortar bed and laying 75 mm thick acid resisting(A/R) bricks with A/R mortar, curing, pointing(with phenolic based A/R cement), protection and cleaning, finishing, etc., complete as per drawing and specifications.	SQ.M	90				
820	Providing, fitting& fixing, outlet and overflow, cast iron roof drain heads (with gratings) in chimney roof including sockets, adapters, brackets, hangers, supports, etc., casting-in and jointing to 150 mm nominal bore rainwater pipes, grouting, etc. including the cost of all labour material and equipment, transporting, lifting, setting in place, painting, etc. complete as per drawing and specifications.	EACH	2				

SL. NO	DESCRIPTION	UNIT	TOTAL QTY		RATE		AMOUNT	REMARKS
			In figures		In figures	In words	IN EUROS	
821	Providing, fitting and fixing rainwater pipes at all levels internally from the chimney roof to ground level upto the hood drain basin including shoes, bends, junctions, flanges, hoppers, sockets, adaptors, brackets, hangers, supports, anchor fasteners, spacers, pipe sleeve through shell, silicon or vulcanised butyl seant, foam backing material, jointing, socketing, grouting, caulking, primer and finish painting etc. complete including the cost of all labour, material and equipment, complete as per drawing and specifications:							
	a) 150 mm nominal bore cast iron pipes.	RM	50					
	b) 150 mm nominal bore medium class galvanised mild steel pipes.	RM	200					
822	Providing and installing an electrically operated grill type steel roll-up door (with the bottom 0.5 metres of the curtain in solid type) at chimney base, in opening of size 4 m by 5 m, with all hardware and mechanisms, fittings and fixtures, locking arrangements, frames, fasteners, gear handle arrangement for standby manual operation, all electrical accessories such as motors, control systems, cables, etc. including the cost of all labour, material and equipment, fixing in position, grouting primer and finish painting, testing, etc., complete as per drawing and specifications.	EACH	1					
823	Providing and installing at any level and location, mild steel, double plate, personnel access doors, in shell openings of size 1.1m by 2.15m, complete with all fittings and fixtures, locking arrangements, frames, fasteners including the cost all labour, material and equipment, lifting to all heights, setting in place, grouting primer and finish painting, etc., complete as per drawing and specifications.	EACH	4					
824	Supplying, fabricating and installing mild steel hatches at various locations in the chimney system complete with locking arrangements, frames, insulation, fittings and fixtures and all mechanisms and accessories reqd. for proper operation including all labour, painting etc. complete as per drawings and specifications.							
	a) Hood Access Hatch	EACH	2					
	b) Equipment Hatch	EACH	2					
	c) Liner Access Hatch	EACH	2					
825	Conducting load testing on girders for 1.25 times the full load, on ground, including provision of test bed and jacks, dial gauges and other supplies complete as per specification and drawings and approval of engineer in charge.	Pair	6					
							SUB TOTAL A	
<b>PART B</b>	<b>RCC CHIMNEY ELECTRICAL WORKS</b>							
	<b>(Supply, installation and testing / commissioning of following items as per specification)</b>							
E1	400V, 200A, 50 KA for 0.25 sec. 4 wire AC Distribution Board with 1No. incomer (SFU) & 9 nos. of 100A (TPN) outgoing complete in all respects	No.	1					
E2	400V, 200A, 4 wire AC Emergency Lighting distribution board alongwith 50KVA lighting transformer (380/400 V, Dyn11, Z=4%, ±2x2.5% off ckt. Tap) with 2 nos. of incomers with auto changeover facility using contactors and 6 nos. 100A SFU (TPN) outgoing complete in all respects.	No.	1					
E3	Normal AC lighting panel outdoor type with degree of protection IP 55 with one no. 100A SFU (TPN) Incomer 18 outgoing (16A SP MCBs) complete in all respects	No.	2					
E4	Emergency lighting panel outdoor type with degree of protection IP 55 with One no. of 100A TPN/SFU incomer and 12 outgoing (16A, SP MCBs) complete in all respects	No.	1					
E5	Aviation lighting panel outdoor type with degree of protection IP 55 with one no. 100A SFU (TPN) Incomer, 8 outgoing 32A SFU (TPN), photodetector and timer circuit along with 100A contactor to control aviation lighting system.	No.	1					
E6	Aviation obstruction lights : a. LOW INTENSITY TYPE B AS PER ICAO, LED TYPE WITH 20 YEARS MAINTENANCE FREE LIFE, including all accessories, controller etc complete in all respects.	No.	4					
	a. MEDIUM INTENSITY TYPE B AS PER ICAO, LED TYPE WITH 20 YEARS MAINTENANCE FREE LIFE, including all accessories, controller, flasher etc complete in all respects.	No.	8					
E7	Flood light with 250W HPSV lamps with all control gears & accessories etc complete in all respects.	No.	4					
E8	(A)Well glass type luminaries with 70W/HPSV lamp with all control gears & accessories	No.	40					
E9	(B)Well glass type luminaries with 150W/HPSV lamp with all control gears & accessories	No.	20					
E10	63Amp welding switch socket with plug & other Mounting accessories etc complete in all respects	No.	3					
E11	3 pin, 1 ph, 240V, 15Amp. Industrial Power sockets complete with plug Switches etc.	No.	5					
E12	Al conductor, PVC insulated, Armoured, PVC outer sheath, FRLS type 1100V grade conforming to IS-1554 Part I. a. 3∅ C x95mm <sup>2</sup> Al for connection between ACDB/ELDB/ welding sockets b. 3∅ Cx35mm <sup>2</sup> Al for Lighting panel incoming supply b. 3∅ Cx16mm <sup>2</sup> Al for Lighting panel incoming supply	RM	1800					
		RM	300					
		RM	200					
E13	PVC insulated 650/1100V grade stranded Cu Conductor lighting wires conforming to IS-694/equivalent BS/ASTM/equivalent approved spec by BHEL/PEEGT for the following. a. 2.5 mm <sup>2</sup> b. 4.0 mm <sup>2</sup>	RM	2000					
		RM	3000					
E14	GI conduit 25mm dia with junction boxes, pull boxes & accessories etc complete in all respects	RM	1500					
E15	Lightning protection Air terminal	RM	10					
E16	Electrical equipment earthing materials including down conductors. (a) Below ground earthing system (b) above ground earthing system	RM	100					
		RM	500					
E17	Telephone socket with junction box etc complete as per drawings & specification	No.	5					
E18	Telephone hand sets etc complete as per drawings & specification	No.	5					
E19	Telephone cables complete as per drawings & specification (a) 24 pairs (b) 4 pairs	RM	75					
		RM	150					
E20	GS cable trays. Cable trays shall be of ladder type constructed of minimum 2 mm thick mild steel hot dip galvanised. 600 mm wide 300 mm wide 150 mm wide	RM	150					
		RM	100					
		RM	100					

SL. NO	DESCRIPTION	UNIT	TOTAL QTY	RATE		AMOUNT	REMARKS
				In figures	In words	IN EUROS	
E21	Aviation Distribution Board (ADB) with one 32A SFU (TPN) incomer and 6 nos. SP 20A MCB. Construction is same as Lighting Panel.	No.	1				
E22	SUPPLYING, ERECTING AND DESIGNING RACK AND PINION TYPE STACK ELEVATOR with total travel shall be of 125m(approx) with Approx 4 landings including ground floor. The Elevator with capacity as 400 kg shall include the major equipments as Drive Motor, Control Panel, Over Speed Governor, Limit Switches, Cable Trolley, Buffers, Elevator Cab, Cab Door and enclosure/landing door etc.	Lumpsum	1				
						SUB TOTAL B	
<b>PART C</b>	<b>STRUCTURAL STEEL WORKS</b>						
<b>2300</b>	<b>STRUCTURAL STEEL WORKS INCLUDING COST OF ALL MATERIALS, LABOUR AND EQUIPMENT FOR HANDLING, EXECUTING, TESTING, PERFORMING ALL ASSOCIATED OPERATIONS ETC. COMPLETE AS PER DRAWINGS, SPECIFICATIONS, MANUFACTURER'S RECOMMENDATIONS, RELEVANT SYRIAN/BS STANDARDS AND/OR AS APPROVED BY PEEGT/BHEL UNLESS SPECIFIED OTHERWISE FOR THE FOLLOWING:</b>						
2301	Supply, fabrication, erection, alignment, welding, bolting (Bolts to be paid separately), primer painting including blast cleaning of steel structures to near white metal surface(Sa 2 1/2 ) and applying epoxy based high zinc phosphate primer in coats of minimum 25 micron (DFT) at shop and 25 micron (DFT) after erection. Paint & primer should be as per relevant Syrian/BS standards and as approved by PEEGT/BHEL. <b>Structural steel should be mild steel</b> conforming to S275JR for Rolled sections, plates upto 20mm thickness, S275J0 for plates above 20mm and S275J2 for plates used in Gantry girder as per BS EN10025/BS 5950-2 or E250A for Rolled sections, plates upto 20mm thickness, E250B for plates above 20mm and E250C for plates used in Gantry girde as per IS:2062 as approved by PEEGT/BHEL. Structural steel works shall consist of structural steel with mild steel rolled section / built up section / combination of both, pipes conforming to relevant Syrian/BS standards, chequered plate conforming to relevant Syrian/BS standards and as approved by PEEGT/BHEL and mild steel rounds, at all elevations in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, gratings, portals, laced purlins, space frames, shear connectors, 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 toeplates, MS Rungs, insert plates, edge angles, embedments, lugs, posts, stays, louvers, lacings, gusset plates, safety chains for walkways adjacent to crane girders etc. collection of steel from stores, transportation, straightening, making cutting plan, cutting, bending, rolling, grinding, drilling, bolting, erection bolts & nuts (weight erection bolts & nuts not payable, Supply of permanent bolt of grade C mild steel bolts & nuts to be paid separately under ST NO. 2306 (i)), assembly, edge preparation, preheating as per AWS & use of low hydrogen/ radiogenic electrodes as per specification, 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 (Scaffolding, Access ladders, Working Platforms etc.), setting column bases, surface preparation protection against damage in transit, stability of structures, installation of temporary structures (Scaffolding, Access ladders, Working Platforms etc.), setting column bases, surface preparation by means of manual or mechanical power tools as per relevant Syrian/BS standards and as approved by PEEGT/BHEL, touch-up painting, dismantling and removal of all temporary structures (weight of temporary structures not payable), return of surplus / waste steel materials to store etc all complete complete with all labour, material, electrodes and other consumables, equipment, testing (mechanical and non- destructive), preparation of fabrication drawings, joint design calculations and all other general and special requirements as per specification, drawings and as approved by BHEL/PEEGT. Approval of fabrication drawings does not relieve the bidder from the responsibility of its correctness and accuracy.						
a)	Fabrication of steel structures as detailed above including primer painting at shop.	MT	8750				
b)	Erection, alignment, welding, primer painting of structural steel works ( fabricated under item no 2301 a) or other prefabricated material ) including receiving the fabricated material either from Project site or from any where at Project site, all welded field connections, bolting wherever applicable and fixtures wherever necessary as shown on drawings and as directed by the engineer, labour and material, for all heights as per the drawings issued from time to time at the time of execution.	MT	8750				
2302	Extra over ST NO. 2301 for providing and application of two coats of <b>primer consisting of chemical resistant epoxy resin</b> 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 zinc phosphate based epoxy primer, including touch up painting as per relevant Syrian/BS standards and as approved by PEEGT/BHEL.	MT	8750				
2303	Providing & application of <b>epoxy based colour finish paint</b> in two coats with minimum 50 micron total thickness (DFT) of approved make and shade over steel sections already having primer coats (as per ST NO. 2301) at all elevations to achieve an even shade with all materials, labour, equipment, handling including protection and cleaning, scaffolding etc. complete as per specification, drawings, as per relevant Syrian/BS standards and as approved by PEEGT/BHEL. (Total thickness (DFT) including primer shall not be less than 100 micron.)	MT	7485				
2304	Providing & application of <b>anti corrosive synthetic enamel paint of Berger</b> or approved equivalent make and colour in two coats of minimum 50 micron total thickness (DFT) already having primer coats (as per ST NO. 2301) at all elevations to achieve an even shade with all materials, labour, equipment, handling, including protection and cleaning, scaffolding etc. complete as per specification, drawings and instructions of the Engineer as per relevant Syrian/BS standards and as approved by PEEGT/BHEL. (Total thickness (DFT) including primer shall not be less than 110 micron.)	MT	1265				
2305	Supplying, fabrication, transportation, erection and alignment of factory made hot dip <b>galvanised gratings</b> of steel (having minimum galvanisation of 610 g/sqm) conforming to relevant Syrian/BS standards and as approved by PEEGT/BHEL at all elevations including preparation of design drawings and fabrication drawings in flooring, platforms, drain and trench covers, walk-ways, passages, staircases with edge binding strips and anti-skid nosing in treads, fixing clamps etc. complete with other fittings and fixtures including all taxes, duties, transportation, packing, grinding, drilling, bolting (supply of permanent grade 'C' mild steel bolts and nuts to be paid separately under ST NO. 2309 (i)), all welding, edge preparation, blast cleaning of steel surfaces to near white metal surface (Sa 2 1/2) followed by galvanisation complete as per specifications, drawings and instructions of the Engineer.	MT	126				
2306	i) Supplying and fixing in position of permanent <b>mild steel bolts</b> (class 4.6 as per relevant Syrian/BS 5950-2 standards and as approved by PEEGT/BHEL) and nuts, washers etc. up to and inclusive of 39 mm diameter and upto 300mm long for structural steel work complete as per specification, drawings and instructions of the Engineer.	KG	600				
	ii) Supply and fixing in posting of <b>high strength friction grip structural bolts</b> (of property class 8.8 and product grade 'C' as per relevant Syrian/BS-5950-2 standards and as approved by PEEGT/BHEL) and high strength structural hardened and tempered nuts (of property class '8' as per relevant Syrian/BS standards and as approved by PEEGT/BHEL) with hardened and tempered washers as per relevant Syrian/BS standards and as approved by PEEGT/BHEL up to and inclusive of 39 mm diameter and upto 300 mm long for structural steel work complete as per specification, drawings and instructions of the Engineer.	MT	19				

SL. NO	DESCRIPTION	UNIT	TOTAL QTY	RATE		AMOUNT IN EUROS	REMARKS
				In figures	In words		
2307	<b>Dismantling of steel structure</b> at any elevation, lowering of material and carriage of the dismantled material up to field fabrication shop, or, return to projects storage including temporary dismantling, cutting, re-welding, supporting, and restoring to correct position all temporarily dismantled members, re-alignment of all adjacent connected members to their correct positions, ( weight of such adjacent members and temporarily dismantled members not payable) including scaffolding, staging, tools & tackles, gas cutting, welding, consumables, etc complete as per specification, drawings and as approved by PEEGT/BHEL.	MT	30				
2308	<b>Addition to, alterations in and/or modification</b> of "Erection Marks" either in erected position or in the shop including cutting of parts, gouging 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), complete as per specifications, drawings and as approved by PEEGT/BHEL.						
i)	In erected position	MT	6				
ii)	In fabrication yard	MT	11				
2309	<b>Re-erection of dismantled fabricated structural steel</b> members requiring additions, modification, (dismantling and additions to, alterations in and/or modification to be paid separately under ST NO. 2310 and 2311 respectively) including carriage of modified "Erection Marks" from the field fabrication shop to erection site, lifting to required position, 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 dismantled members, re-alignment of adjacent connected members, (weight of such temporarily dismantled members and adjacent members not payable) including scaffolding, staging, tools & tackles, gas cutting, welding, consumables, etc complete as per the specifications, drawings and as approved by PEEGT/BHEL.	MT	11				
2310	Supply, fabrication and delivery at site, transportation, loading/unloading of various sizes, seamless <b>40 dia stainless steel hand railing</b> of approved shape/design including Stainless steel posts, fixing as per specification, labour and material complete.	Kg	551				
2311	Providing and fixing in position <b>PTFE type sliding bearings</b> of reputed manufacturer, individual bearing suitable for required vertical loads as per the construction drawings and for maximum displacement of (+or -) 50 mm including all taxes, duties, transportation, installation, drilling, bolting, erecting, aligning etc complete as per specification, drawing and instruction of the engineer						
i)	Vertical Load of 20 Tons	Nos	11				
ii)	Vertical Load of 50 Tons	Nos	2				
2312	Conducting <b>radiography test</b> on welds wherever specified by the engineer including provision of necessary equipments, measuring devices, gauges, materials and labour as per specifications complete (over and above the work already specified in the specifications for item 2301).	RM	50				
2313	Conducting <b>ultrasonic test on welds</b> wherever specified by the engineer including provision of necessary equipments, measuring devices, gauges, materials and labour as per specifications complete (over and above the work already specified in the specifications for item 2301).	RM	28				
2314	Conducting <b>magnetic particle test on welds</b> wherever specified by the engineer including provision of necessary equipments, measuring devices, gauges, materials and labour as per specifications complete (over and above the work already specified in the specifications for item 2301).	RM	28				
2315	Conducting <b>dye penetration test on welds</b> wherever specified by the engineer including provision of necessary equipments, measuring devices, gauges, materials and labour as per specifications complete (over and above the work already specified in the specifications for item 2301).	RM	28				
2316	Conducting <b>ultrasonic test on steel plates</b> as per ASTM-A435 or equivalent wherever specified by the engineer including provision of necessary equipments, measuring devices, gauges, materials and labour as per specifications complete (over and above the work already specified in the specifications for item 2301).	SQM	110				
						<b>SUB TOTAL C</b>	
						<b>GROSS TOTAL (A+B+C)</b>	

## NOTE

1.0 Evaluation of bids shall be as per clause no. 1.4 of GCC.