

TECHNICAL CONDITIONS OF CONTRACT (TCC)  
CHAPTER XI –BILL OF QUANTITIES AND % WEIGHTAGE OF INDIVIDUAL ITEMS

**Package F-1: Fabrication and Erection of Bunker bay Structure, Bunker Shell, Interconnecting gallery etc within the battery limits of plant area up to final painting and handing over to civil/mechanical/electrical agencies for Unit# 1 & 2 AT 4 X 270 MW Thermal Power Station, Manuguru, Distt-Khammam, Telangana**

**This BOQ & % Weightages are applicable for both Package F.1 and Package F.2**

**PART B: % weightage for amount of individual items of Schedule of quantity w.r.t. the total price**

ST. NO	DESCRIPTION OF ITEM	UNIT	Quantity	% weightage w.r.t. the total price
<b>2300 STRUCTURAL STEEL</b>				
<b>Structural steel works including all labour, material, equipments, transportation, handling etc. at any level as per specification, drawings and as directed by engineer - in - charge.</b>				
2301	Taking delivery of steel from BHEL stores / store yard, loading, Transportation, unloading, fabrication and erection of <b>structural steel with mild steel rolled section / built up section / combination of both</b> conforming to IS:2062, pipes conforming to IS:1161/ IS:1239, chequered plate conforming to IS: 3052, mild steel rounds, monorails, stays, safety chains, ladders, MS grating etc. in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames, hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, chequered plate flooring, decking and seal plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails, tie rods, sag rods etc connection design & preparation of fabrication drgs, collection of steel from stores, fabrication, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of 20° C for welding over 20 mm and upto 40 mm & 66° C for welding over 40 mm and upto 63 mm & 110° C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, online production test coupons, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, surface preparation by means of manual or mechanical power tools as per IS:1477 part 1, touch-up painting, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable), return of surplus / waste steel materials to store etc all complete. Including appointment of a separate agency, approved by BHEL, for preparation / resubmission of fabrication /erection Drawings for review and final approval of fabrication drgs, in consultation with BHEL.			
2301 A	<b>Fabrication and erection of structural steel built up sections made of plated Girders/Columns composed of Structural plates only</b> conforming to IS:2062, in columns, beams, portals, space frames, hangers, struts, monorails, galleries, stiffeners, brackets, stub columns, trestles etc. including straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, assembly, edge preparation, preheating / post heating(if required), inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, <b>online production test coupons</b> , inspection and testing, protection against damage in transit etc all complete as per specification. Payment shall be made for net weight of finished structure along with gussets, stiffeners but not for Nuts & Bolts/washers. Nuts & Bolts/shall be paid under separate item.			
(I)	<b>Fabrication</b>	MT	3188	16.62503837
(II)	<b>Erection, alignment and welding</b> <u>Payment Break up:</u> a) Erection :70% (Seventy Percent) b) Alignment and Welding : 30 % (Thirty Percent)	MT	3188	9.033570137

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2301 B	Fabrication and erection of <b>structural steel with mild steel rolled section ISMC,ISMB,ISA / (angle, channel, beam)</b> conforming to IS:2062, in stub columns, beams, portals etc. including straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, assembly, edge preparation, preheating / post heating(if required), splicing, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works,online production test coupons,inspection and testing, protection against damage in transit etc all complete as per specification. Payment shall be made for net weight of finished structure along with gussets, stiffeners but not for Nuts & Bolts/washers. Nuts & Bolts/washers shall be paid under separate item.			
(I)	<b>Fabrication</b>	MT	637	1.261655139
(II)	<b>Erection, alignment and welding</b> <b>Payment Break up:</b> <b>a) Erection :70% ( Seventy Percent)</b> <b>b) Alignment and Welding : 30 % (Thirty Percent)</b>	MT	637	1.805013857
2301C	Fabrication and Erection of <b>structural steel built up section composed of rolled sections or rolled sections and plates</b> conforming to IS:2062, in columns, beams, gantry girders, roof trusses, portals, frames, hangers, struts,brackets, bracings, base plates, ladders, stairs, stringers, treads, landings, hand-rails etc including straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, assembly, edge preparation, preheating / post heating (if required), inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, online production test coupons,inspection and testing, protection against damage in transit etc all complete as per specification.Payment shall be made for net weight of finished structure along with gussets, stiffeners but not for Nuts & Bolts/washers. Nuts & Bolts/washers shall be paid under separate item.			
(I)	<b>Fabrication</b>	MT	425	1.262830127
(II)	<b>Erection, alignment and welding</b> <b>Payment Break up:</b> <b>a) Erection :70% ( Seventy Percent)</b> <b>b) Alignment and Welding : 30 % (Thirty Percent)</b>	MT	425	1.20428711
2301D	Fabrication and erection of <b>Coal Bunkers and ring beam as per RFC drawings at site with structural steel of grade E250</b> conforming to IS:2062, connection design & preparation of fabrication drgs, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, erection bolts & nuts (weight of erection bolts, nuts and welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of 20° C for welding over 20 mm and upto 40 mm & 66° C for welding over 40 mm and upto 63 mm & 110° C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, online production test coupons, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures.			
(I)	<b>Fabrication</b>	MT	2400	13.77447991

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ST. NO	DESCRIPTION OF ITEM	UNIT	Quantity	% weightage w.r.t. the total price
(II)	<b>Erection, alignment and welding</b>  <u>Payment Break up:</u> a) Erection :70% (Seventy Percent) b) Alignment and Welding : 30 % (Thirty Percent)	MT	1200	6.800680153
2302A	<b>Extra over ST NO. A2301 for shot blast cleaning of steel structures</b> to near white metal surface(Sa 2 1/2 ) and applying zinc phosphate primer in coats of minimum 25 micron (DFT) at shop and 25 micron (DFT) after erection, including touch-up painting etc all complete.	MT	6650	11.32751433
2304	Providing and applying two coats of <b>synthetic enamel paint</b> of approved make and shade to achieve an even shade over steel sections already having primer coats and keeping overall DFT with primer not less than 110 microns including protection and cleaning, scaffolding etc. all complete.	MT	6650	4.666820316
2306	Taking delivery of steel from BHEL stores / store yard, loading, Transportation, unloading, fabrication and Laying and clamping of <b>crane rails</b> over the crane girder at all elevations as per IS 3443 including all fixtures, clamps, testings etc. all complete as per drawing and specification.	MT	100	1.055447274
2307	Supplying, fabrication, erection and alignment of factory made <b>electroforged galvanised grating units</b> with mild steel (having minimum galvanisation of 610 g/sqm) conforming to IS:2062 in flooring, platforms, drain and trench covers, walk-ways, passages, staircases with edge binding strips and anti-skid nosing in treads etc. including fixing clamps, fittings, fixtures, all taxes, duties, packing, grinding, drilling, welding, edge preparation, etc. all complete.  <u>Payment Break up:</u> a) Supply including fabrication : 70%( Seventy Percent) b) Erection and alignment : 30 % (Thirty Percent)	MT	120	4.844897984
2308A	Supplying, fabrication, erection and alignment of factory made <b>welded grating units</b> with mild steel conforming to IS:2062 in flooring, platforms, drain and trench covers, walk-ways, passages, staircases with edge binding strips and anti-skid nosing in treads etc. including 2 coats of zinc-phosphate 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.  <u>Payment Break up:</u> a) Supply including fabrication : 70%( Seventy Percent) b) Erection and alignment : 30 % (Thirty Percent)	MT	20	0.748611905
2309	Extra over above ST NO. 2301 for <b>finishing the grating units</b> with hot dipped galvanisation @ 610 gm/sqm over blast cleaned steel surfaces instead of painting with two coats of red oxide zinc-chromate primer all complete.	MT	18	0.166241745
2310	Providing and fixing in position of <b>permanent mild steel bolts (class 4.6 as per IS : 1367 and grade `C' as per IS: 1363)</b> and nuts, washers etc. up to and inclusive of 39 mm diameter and upto 300mm long for structural steel work etc all complete.  <u>Payment Break up:</u> a) Supply : 70%( Seventy Percent) b) Fixing in position: 30 % (Thirty Percent)	Quintal	250	1.32468649

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ST. NO	DESCRIPTION OF ITEM	UNIT	Quantity	% weightage w.r.t. the total price
2311	<p><b>Providing and fixing in positing of high strength structural bolts</b> (of property class 8.8 and product grade `C' as per IS: 1367) and conforming to IS: 3757 and high strength structural hardened and tempered nuts (of property class `8' as per IS:1367) conforming to IS:6623 with hardened and tempered washers as per IS:6649 etc. up to and inclusive of 39 mm diameter and upto 300 mm long for structural steel work etc all complete.</p> <p><b>Payment Break up:</b> a) Supply : 70%( Seventy Percent) b) Fixing in position: 30 % (Thirty Percent)</p>	Quintal	1200	17.25981545
2312	<b>Dismantling of steel structure</b> , lowering of material and carriage of the dismantled material up to field fabrication shop / projects storage including temporary dismantling, cutting, re-welding, supporting, and restoring to correct position all temporarily dismantled members, re-alignment of all adjacent connected members to their correct positions ( weight of such adjacent members and temporarily dismantled members not payable), scaffolding, staging, tools & tackles, gas cutting, welding, consumables etc all complete.	MT	65	0.164018219
2313	Addition to, alterations in and/or modification of " <b>Erection Marks</b> " including cutting of parts, gauging of welds, cutting, grinding, fabrication, welding, drilling holes, straightening, removal of bends, raising to the required level, painting, transportation, return of unutilised steel pieces to the project store, temporarily dismantling, cutting, re-welding, supporting and restoring to correct position of all the temporarily dismantled members, realignment of adjacent connected members (weight of such temporarily dismantled and adjacent members not payable) etc all complete for the following:			
a	In erected position	MT	43	0.10850436
b	In fabrication yard	MT	80	0.201868577
2314	<b>Re-erection of dismantled fabricated structural steel</b> members including carriage of modified "Erection Marks" from the field fabrication shop to erection site, lifting to required posiiion, aligning in position, tack welding, final welding and touch up painting including temporary dismantling and re-erection of temporarily dismantled members, cutting, rewelding, supporting and restoring to the correct position of all temporarily dismnatled members, re-alignment of adjacent connected members(weight of such temporarily dismantled members and adjacent members not payable), scaffolding, staging, tools & tackles, gas cutting, welding, consumables etc all complete.	MT	39	0.196821862
2316A	Taking delivery of steel from BHEL stores / store yard, loading, Transportation, unloading, fabrication and erection of <b>minimum 3.15 mm thick stainless steel liner of grade AISI-304</b> ; Finish Grade 2B (Cold rolled, Annealed & Pickled and Skin passed) on M.S. plate for inside surfaces of hopper & mouth of hopper of bunkers including fixing with stainless steel studs, bolting (including countersunk), welding with electrode classification E308L for welding of stainless steel to stainless steel and E309 for stainless steel to mild steel etc. all complete.			
(l)	Fabrication	MT	140	1.432486465

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(II)	<b>Erection, alignment and welding</b>	MT	140	0.818476787
2317	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 $\pm 50$ mm including all taxes, duties, transportation, installation, drilling, bolting, erecting, aligning etc all complete for following vertical loads.			
a	20 Tons	EACH	4	0.027252432
b	25 Tons	EACH	5	0.039742767
c	40 Tons	EACH	5	0.062453851
d	50 Tons	EACH	2	0.027252432
e	60 Tons	EACH	2	0.034822069
2318	Providing and fixing flexible open ended <b>bellow strap of neoprene</b> of minimum thickness 2 mm and minimum width 200 mm with aluminium stripped edges as sealing below top of bunker and bottom of tripper floor to avoid the coal dust nuisance all complete.	RM	200	0.126189587
2319	Supply, fabrication and fixing of <b>stainless steel pipe hand railing</b> of 32 mm/40 mm dia including transportation, loading/unloading etc. all complete.  <b>Payment Break up:</b> a) Supply : 70%( Seventy Percent) b) Fixing in position: 30 % (Thirty Percent)	MT	8	1.150668268
2320A	Supply, fabrication and fixing of <b>GI pipe hand railing (1000 mm high)</b> of 32 mm/40 mm dia (Medium Grade) including transportation, loading/unloading, painting etc. all complete.  <b>Payment Break up:</b> a) Supply : 70%( Seventy Percent) b) Fixing in position: 30 % (Thirty Percent)	MT	35	1.589745459
2321	Conducting <b>radiography test on welds</b> wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM	210	0.143084392

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2322	Conducting <b>ultasonic test on welds</b> wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM	230	0.26115248
2323	Conducting <b>ultasonic test on steel plates</b> as per ASTM-A435 or equivalent wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	SQM	80	0.090835645
2324	Conducting <b>magnetic particle test on welds</b> wherever specified including equipments, measuring devices, gauges, test report etc. all complete.	RM	90	0.085177971
2325	Conducting <b>dye penetration test on welds</b> wherever specified by the engineer including provision of necessary equipments, measuring devices, gauges etc. all complete (over and above the work already specified in the specifications.)	RM	200	0.050753939
804	Providing & grouting of pocket holes, pipe sleeves and under base plates of structural steel work/ machinery/ pipe supporting structures including roughening of surface, cleaning, ramming, curing etc. all complete with ConbextraGP-1 or equivalent. (Cost of all material and cleaning of the pockets by compressed air shall be in the scope of the contractor).	CUM	10	0.227102149
<b>GRAND TOTAL Weightage</b>				<b>100</b>