



BIDDING DOCUMENT
for
Construction of Indoor Stadium at Zuangtui,
Aizawl

VOLUME-II
(Price Bid)

Issued on : 17th April, 2021
Invitation for Bids No : B-11030/114 (Prog-Gen)/2018/ASCL/109
Contract Package No : MIZ-AIZ-129/ISZ/16
Employer : AIZAWL SMART CITY LIMITED, AIZAWL
State : MIZORAM
Country : INDIA



AIZAWL SMART CITY LIMITED, AIZAWL

Price Bid

This Section contains the forms which are to be completed by the Bidder and submitted as part of his Price Bid.

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Letter of Price Bid

Date:

NCB No.:

Invitation for Bid No.:

To:

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) 8;
- (b) We offer to execute in conformity with the Bidding Documents and the Technical Bid submitted for the following Works:
- (c) The total price of our Bid, excluding any discounts offered in item (d) below is:
- (d) The discounts offered and the methodology for their application are:
- (e) Our Bid shall be valid for a period of days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;
- (g) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: *

Name of Recipient	Address	Reason	Amount
.....
.....

- (h) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and

- (i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

- (j) We agree to permit ADB or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB.

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

* *If none has been paid or is to be paid, indicate "none".*

Schedules

Preamble

(A) General

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, Conditions of Contract, Specifications and Drawings.
2. For the construction of works, the quantities given in the Bill of Quantities are estimated quantities, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the agreed individual item rates. Bills will be raised monthly. The method of measurement shall be as per norms laid out by the Bureau Of Indian Standard's publication IS: 1200 (Latest Editions with updated amendments).
3. For the Project's Environmental Management Plan (EMP), the contractor shall raise an invoice every quarter, listing out the actual costs for the implementation of environmental measures. These bills will be paid out of Provisional Sums. An amount of 3% of the estimated cost has been specified as contingency sum for payment of works not detailed in the BOQ but ordered by the Engineer at his discretion, in the best interests of the project
4. A rate or price shall be entered against each item in the Priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor has failed to enter a price or rate shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. The whole cost of complying with the provisions of the contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of work.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. Reference to relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
7. The rates and prices tendered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the Contract, include all constructional plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out in the Contract. Import duty and excise duty on materials and goods to be imported shall not be included in the Unit Rates and the Employer shall issue certificates exempting the Contractor from payment of these duties.
8. Item Rate BOQ to be appended after firming up of Detailed Design in DPR
9. Arithmetic errors will be corrected by the Employer as follows:
 - a. if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
 - b. if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

- c. if there is a discrepancy between words and figures, the Amount (In INR) in words shall prevail, unless the Amount (In INR) expressed in words is related to an arithmetic error, in which case the Amount (In INR) in figures shall prevail subject to (a) and (b) above.

10. Rock is defined as all materials that, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and that cannot be extracted by ripping with a tractor of at least 150 brake hp with a single, rear-mounted, heavy-duty ripper.

(B) Work Items

The Bill of Quantities contains following Schedules:

Construction of Indoor Stadium at Zuangtui.

The Details bills of quantities are as follows:

BILL OF QUANTITIES
ABSTRACT OF COST

CONSTRUCTION OF INDOOR STADIUM AT ZUANGTUI, AIZAWL

Sl. No.	Description	Total Amount
1	EARTH WORK	
2	CONCRETE WORK	
3	REINFORCED CEMENT CONCRETE	
4	BRICK WORK	
5	MARBLE AND GRANITE WORKS	
6	WOOD WORK & ALUMINIUM FITTINGS	
7	STEEL WORK	
8	FLOORING	
9	CEILING	
10	ROOFING	
11	FINISHING	
12	FENCING	
13	DISMANTLING AND DEMOLISHING	
14	ALUMINIUM WORK	
15	WATER PROOFING	
16	HORTICULTURE AND LANDSCAPING	
17	ROAD WORK	
18	SEPTIK TANK (2 x 50 Users)	
19	UG Tank & Rainwater Storage Tank	
	Subtotal (Civil Work)	
20	MR Item(Civil) Total Amount	
	Sub total (MR Items)	
21	Electrical Works	
22	Plumbing Works	
23	Fire Fighting Works	
	Subtotal (Electrical+Plumbing+Fire Work)	
	Total Amount	
25	Add contingency @3%	44,85,000.00
	Grand Total Amount	

G. Total Rs _____
(Rupees _____) only

**PUBLIC PLAYGROUND AND CONVENTION CENTRE AT ZUANGTUI, AIZAWL
BILL OF QUANTITIES (CIVIL)**

Sl. No.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1.00	EARTH WORK				
1.01	Carriage				
	Excavated Rock -1 km	Cum	3606.85		
1.02	Clearing and grubbing road land including uprooting rank vegetation, grass, brush shrubs, saplings and tree of girth upto 300mm, removal of stumps, disposal of serviceable material upto 100 metres from road boundary.				
	By Mechanical means. (for all classes of jungle.)	Sqm	5164.00		
1.03	Felling trees of girth (measured at height of 1m above ground level) including cutting of trunks and branches and removing the roots and stacking of serviceable material and disposal of unserviceable material with all lifts and upto a lead of 100 metres and earth filling in the depression/pit.				
	Girth from 30 cm to 60 cm	No	2.00		
	Girth from 60 cm to 120 cm	No	1.00		
	Girth from 120 cm to 240 cm	No	1.00		
1.04	Earth work in excavation by mechanical means (exceeding 30 cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by engineer-in-charge.				
	All kinds of soil (excluding ordinary & hard rock)	Cum	2167.94		
	Ordinary Rock	Cum	3606.85		

1.05	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum	1000.00		
1.06	Extra for every additional lift of 1.5 m or part thereof in excavation/banking excavated or stacked materials				
	All kinds of soil	Cum	317.00		
1.07	Providing and filling approved river sand in trenches, plinth, etc. in layers not exceeding 20 cms in depth, consolidating each layer by ramming and watering and dressing complete.	Cum	343.06		
1.08	Diluting and injecting chemical emulsion for post constructional anti termite treatment with Chlorphyriphos/Lindane emulsifiable chemical 20% with 1% concentration				
	Treatment of soil under existing floor using chemical emulsion @ 1 litre per hole, 300 mm apart including drilling 12mm diameter holes and plugging with cement mortar 1:2 (1 cement: 2 coarse sand) to match the existing floor.	Sqm	1356.00		
	Total of sub-head	(1)			
2.0	CONCRETE WORK				
2.01	Providing and laying in position cement concrete of specified grade excluding cost of centring and shuttering -All work upto plinth level				
	1: 4 :8 (1 cement : 4 coarse sand : 8 stone aggregate 40 mm nominal size)	Cum	311.47		

2.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:				
a)	1:2:4 (1 Cement : 2 course sand : 4 stone aggregate 20mm nominal size)	Cum	10.00		
2.03	Providing and laying cement concrete in retaining wall, return wall, walls (any thickness) including pilasters, piers, columns, abutments, pillars, posts, plain window sills, sunken floors, etc. upto floor five level excluding the cost of centering, shuttering and finishing:				
	1 : 2: 4 (1 cement : 2 course sand : 4 stone aggregate 40 mm)	Cum	5.00		
2.04	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 course sand : 4 stone 12.5 mm size).	sqm	61.00		
2.05	Extra for providing and mixing water proofing material in doses by weight of cement as per manufacturer's specification	Per Bag of Cement	16.00		
2.06	Applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7 kg. per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	Sqm	61.00		
2.07	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement :3 coarse sand : 6 graded stone aggregate 20mm nominal size) over 75 mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	Sqm	118.55		

	Total of sub-head	(2)			
3.0	REINFORCED CEMENT CONCRETE				
3.01	Providing and laying in position machine batched and machine mixed design mix M-20 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but 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 as per direction of Engineer-in-charge. "(Note:Cement content considered in this item is @ 330 kg/cum." Excess/less cement used as per design mix is payable/recoverable separately).				
	All works upto plinth level	Cum	506.84		
	All work form plinth level upto floor V level	Cum	902.13		
3.02	Extra for providing richer or leaner mixes respectively at all floor levels.				
	Providing M-25 grade concrete instead of M-20 grade BMC/RMC. (Note:- Cement content considered in M-25 is @ 330 Kg/cum)	Cum	1408.97		
3.03	Centering and shuttering including strutting, propping etc. And removal of form for all heights				
	Foundation, footings, bases of column etc. for mass concrete.	Sqm	344.86		
	Walls including attached pillasters, buttresses, string course, etc.	Sqm	84.00		

	Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj, etc.	Sqm	2121.00		
	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm	2951.64		
	Columns, pillars, piers, abutments, posts and struts.	Sqm	1008.34		
	Staircases (except spiral staircase) excluding landings.	Sqm	170.00		
3.04	Steel reinforcement for RCC work includingh straighthening, cutting, bending, placing in posiiton and binding all complete.				
	Thermo-Mechanically Treated bars of grade Fe-500 or more	Kg	259472.68		
	Total of sub-head	(3)			
4.0	BRICK WORK WITH F.P.S. BRICKS				
4.01	First class Brickwork in foundation and plinth in :				
	In cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	27.67		
4.02	First class brick in superstructure above plinth level upto floor V level in :				
	In cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	606.52		
4.03	Half brick masonry with first class brick in foundation and plinth in:				
	In cement mortar 1:4 (1 cement : 4 coarse sand)	Sqm	30.00		
4.04	Half Brick Masonry with first class brick in superstructure above plinth level upto floor V level:				
	In cement mortar 1:4 (1 cement : 4 coarse sand)	Sqm	1224.00		

4.05	Extra for providing and placing in position 2 Nos. 6mm dia.M.S. bars at every third course of half brick masonry.	Sqm	1224.00		
	Total of sub-head	(4)			
5.0	REINFORCED CEMENT CONCRETE				
5.01	Marble work gang saw cut (polished and machine cut) of thickness 18 mm for wall lining (veneer work), backing filled with a grout of 12 mm thick average in cement mortar 1:3 (1 cement : 3 coarse sand) including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) with an admixture of pigment to match the marble shade:				
	Green marble granite polish.	Sqm	24.00		
5.02	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and simillar locations, of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement:4 coarse sand)joint treated with white cement matching with matching pigment, epoxy touch up, including rubbing ,curing ,moulding & polishing to edges to give high gloss finish etc. complete at all levels. Raj Nagar Plain white marble / green white marble /plane white marble.				
	Granite(general black)	Sqm	16.00		
5.03	Providing edge moulding to 18 mm thick marble s tone counters, Vanities etc. including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.				
	Marble work	Rm			

	Granite work	Rm	25.00		
5.04	Extra for fixing marble/granite stone over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based (Araldite or equivalent) adhesive including cleaning etc. complete.	Rm	25.00		
5.05	Extra for providing opening of required size and shape for wash basins/kitchen sink in kitchen platform, vanity counters and similar location in marble/stone work including necessary holes for pillar taps etc. including rubbing and polishing of cut edges etc. complete.	Per Opening	27.00		
5.06	Mirror polishing on marble work/stone work wherever required to give high gloss finish complete.	sqm	16.00		
5.07	Providing and fixing cramps of required size and shape in RCC/CC backing with cement mortar 1:2 (1 cement : 2 coarse sand) including drilling necessary hole in stones and embedding the cramp in the hole (fastener to be paid separately)				
	Stainless steel cramps	Kg	150.00		
5.08	Providing and fixing stone slab with table rubbed, edges rounded and polished, of size 75x50 cm deep and 1.8 cm thick, fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the case with epoxy grout or with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6mm nominal size) as per direction of Engineer-in-charge and finished smooth.				
	Granite Stone of approved shade	sqm	8.00		
	Total of sub-head	(5)			
6.0	BRICK WORK				

6.01	Providing first class Teak Wood dressed in frames of chowkath for Doors, windows, Clerestorey, windows fixed in position.	Cum	4.00		
6.02	Providing and fixing Hollow core flash door, shutters with frame of first class local wood and well matched Commercial ply 4 mm thick veneering with vertical grains or cross bands and face veneers on both face of shutters including MS Butt hinge with necessary screws.				
	35 mm thick	sqm	146.00		
6.03	Providing and fixing plain, chamfered edged 1st class local wood beading with screws or nails for walls, ceiling, etc. Complete. (Basis:CPWD Analysis of Rates, 2003 Vol-III-375 & 376)				
	50mm x 12mm	Rm	100.00		
6.04	Providing and fixing aluminium sliding door bolts (aldrops) anodised transparent or dyed to required colour or shade with nuts and screws etc. complete.				
	300x16 mm	No	41.00		
6.05	Providing and fixing Aluminium Tower Bolts (Socket Bolts anodised transparent or dyed to required colour or shade with necessary screws etc. complete.				
	250 mm	No	79.00		
	150 mm	No	79.00		
6.06	Providing and fixing Aluminium handles anodised transparent or dyed to required colour or shade with necessary screws, etc. complete.				
	125mm	Each	166.00		
6.07	Providing and fixing Curtain Rod with necessary screws and fittings, etc. complete				
	Bright finished	Rm	50.00		

6.08	Providing and fixing Imex window fittings including necessary screws complete. Friction hinges for Aluminium windows etc.	No	5.00		
6.09	Providing and fixing bright finished brass two lever mortise door lock with necessary screws, etc. complete.				
	Knob type	No	75.00		
	Total of sub-head	(6)			
7.00	STEEL WORK				
7.01	Supplying and fixing steel rolling shutter of approved make, made of required size of M.S. 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 push and pull operation complete including the cost of providing and fixing necessary wire spring and M.S. top cover.	Sqm	46.80		
7.02	Providing and fixing ball bearing for rolling shutters.	No	2.00		
7.03	Extra for providing mechanical device, chain and crank operation for operating rolling shutters.-	Sqm	46.80		
7.04	Exceeding 10.00 sqm and upto 16.80 sqm in area. (average say 14.00 sqm)	Sqm	46.80		
7.05	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete.	Kg	63503.04		

7.06	Supplying and fixing M.S. decorative railing consisting of top & bottom rails of 40*40mm square or circular section at distance of 788mm apart ,30mm*30mm square & circular section decorative intermediate balusters welded to top & bottom rails at 280mm apart .the base of balusters at 560mm apart welded with base plates of 60 x 60 x 3mm thick plate at the base fixed with cement grouting firmly to concrete section including steel priming and steel painting complete etc.	Sqm	10.00		
7.07	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories and stainless steel dash fasteners, stainless steel bolts etcf. of 80 cm high in staircase, etc. consisting of 75mm for rail and post, 64 mm for longitudinal intermediate rail and 25 mm of vertical section, spacing 125 mm interval and as per approval of Engineer-in-charge.	Sqm	183.54		
	Total of sub-head	(7)			
8.00	FLOORING				
8.01	Cement concrete flooring 1:2:4 (1 cement : 2 sand : 4 well graded stone aggregate 20 mm size) finished with a floating coat near cement including cement slurry etc. complete but excluding the cost of nosing of steps etc. 40mm thick with 20mm nominal size stone aggregate	Sqm	436.00		
8.02	Providing and fixing glass strips 40 MM wide and 4 mm thick in joints of terrazzo/cement concrete floors.	Rm	30.00		

8.03	Chequered precast cement concrete tiles 22mm thick with marble chips of size upto 6mm in floor, treads of step, landing, footpath and courtyard jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and cleaning etc. complete on 20mm thick bed of cement mortar 1 : 4 .				
	medium shade using 50% white cement & 50% ordinary cement	Sqm	967.00		
8.04	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08 and conforming to IS:15622, of approved make, in all colours and shades, laid on bed of 20mm thick cement mortar 1:4 (1 cement : 4 Course sand), including the joints with white cement and matching pigments etc. complete. as per design colours.				
a)	Double Charge	Sqm	773.00		
8.05	Providing and laying vitrified tiles in different sizes (thickness to be specified by the the manufacturer) with water absorption less than 0.08 and conforming to IS:15622, of approved make, in all colours and shades, in skirting/dado, riser of steps, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS:15477, in average 6mm thickness, including grouting of joints (Payment for grouting of joints to be made separately).				
	Double Charge	Sqm	710.00		
8.06	Grouting the joints of flooring tiles having joints of 3 mm width using epoxy grout mix of 0.70 kg. of organic coated filler of desired shade (0.10 kg of hardener and 0.20 kg. of resin per kg) grouting and finishing complete as per direction of Engineer-in-charge.	Sqm	1483.00		

8.07	Kota stone slab flooring over 20mm (average) thick base laid over cement mortar 1:4 and jointed with white cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete.				
	25 mm thick.	Sqm	283.00		
8.08	Kota stone slab 25 mm thic in skirting, risers of s tepts, dado and pillars laid on 12 mm (average) thick base laid over cement mortar 1:3 and jointed with white cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete.	Sqm	29.00		
8.09	Extra for kota stone flooring in treads of steps and risers using single length upto 1.05m.	Sqm	10.00		
8.10	Extra for pre finished nosing in steps and treads of kota stone.	metre	10.00		
8.11	Providing and laying Precast interlocking Paver tiles (CDI pattern) of approved make locally available at Aizawl over a sand cushion and 100 mm thick PCC bed of 1:2:4 including supplying, placing and cleaning, etc., complte (Cost of dressing of soil and PCC to be paid seperately).	sqm	720.00		
	Total of sub-head	(8)			
9.00	CEILING				
9.01	Providing and fixing recessed ceiling with 12.5 mm tapered Gypboard which includes providing and fixing G.I. perimeter funnels with nylon sleeves and screws intermediate channels fixed to GI seat steel expansion fastener etc. all complete including rounding, filling and finishing the tapered and square of the board with jointing compound and two coats of primer suitable to Gypboard.	Sqm	430.00		

9.02	Supplying, fitting and fixing calcium silicate board ceiling with necessary screws etc. complete excluding frame work of base and beading. (Hilux or equivalent).	sqm	159.00		
9.03	Providing and fixing aluminium frame works for ceiling lining consisting of battens 50x25mm fixed over plugs embedded in wall with necessary nails or screws, etc. complete.	sqm	159.00		
	Total of sub-head	(9)			
10.0	Roofing				
10.01	Providing and fixing 15 cm wide 45 cm over all semi circular plain G.S. sheet gutter with iron brackets 40x3mm size, bolts, nuts and washers etc. including making necessary connections with rain water pipes complete.				
	80mm thick with zinc coating not less than 275kg/m ²	Rm	212.00		
10.02	Providing Trapezoidal Polyester Coated Galvanised Steel Sheets Roofing of any colour of 1.06m width at all levels including fitting and fixing ridging with self drilling , self tapping screws, EPDM washers etc. complete excluding the cost of purlin, rafter and trusses.				
	for 0.50mm thick	Sqm	2237.00		
10.03	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 :				
	- 110 mm diameter	Metre	29.30		

10.04	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for 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.				
	- 110 mm Coupler	Nos	6.00		
	- Single tee with door (110x110x110 mm)	Nos	2.00		
	- Single tee without door (110x110x110 mm)	Nos	2.00		
	- Bend 87.5° 110 mm	Nos	2.00		
10.05	Providing and fixing unplasticised - PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50mm hard wood plugs, screwed with M.S. screws of required length including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.				
	- 110 mm	Nos	30.00		
	Total of sub-head	(10)			
11.00	FINISHING				
	CEMENT PLASTER (IN COARSE SAND)				
11.01	12 mm cement plaster 1:6 (1 cement : 6 fine sand)	Sqm	617.11		
11.02	15 mm cement plaster 1:6 (1 cement : 6 fine sand)	Sqm	3864.00		
11.03	20 mm cement plaster 1:4 (1 cement : 4 fine sand)	Sqm	3358.00		
11.04	6 mm cement plaster to ceiling 1:4 (1 cement : 4 fine sand)	Sqm	2121.00		
11.05	Extra for providing and mixing water proofing materials in proportion recommended by manufacturer in				
	20mm cement plaster 1 : 4 (1cement : 4 sand)	Sqm	3358.00		

11.06	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plasterd wall surface to prepare the surface even and smooth complete.	Sqm	6603.00		
11.07	Finishing walls with exterior emulsion of required shade on new work (three or more coats) to give an even shade.				
	Premium exterior emulsion like weather shield, weathercote etc.	Sqm	3358.00		
11.08	Applying one coat of Efflorescence resistant penetrating primer for Raincoat, Newcoat & Heatshield of apporoved brand and manufacture on wall surface, cement primer of approved brand and manufacture on wall surface.	Sqm	3358.00		
11.09	French spirfit polishing (two or more coats) on new works inclujding a coat of wood filler:	Sqm	100.00		
11.10	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications.				
	On steel work	Sqm	150.00		
	On concrete work	Sqm	150.00		
11.11	White washing with lime to give an even shade: New work (Three of more coats)	Sqm	150.00		
11.12	Painting with silicon and acrylic emulsion based water thinnable sealer of approved brand and manufacture on wet or patchy portion of plastered surfaces: Two coats	Sqm	150.00		
11.13	Painting on G.S. sheet with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade on new work (two or more coats) including a coat of approved steel primer but excluding a coat of mordant solution	Sqm	150.00		

11.14	Painting two or more coats on G.I sheet with antifungus roof paint of approved brand and manufacture on new work to give an even shade	Sqm	150.00		
11.15	Applying priming coat with ready mixed pink or Grey primer of approved brand and manufacture on wood work (hard and soft wood) and Plywood.	Sqm	50.00		
11.16	Applying priming coat with ready mixed red oxidized zinc chromate primer of approved brand and manufacture on steel galvanised iron/steel works.	Sqm	50.00		
	Total of sub-head	(11)			
12.00	FENCING				
12.01	1.8m high G.I. barbed wire fencing with 2.4m angle iron posts 50 x 50 x 6mm size placed 2.0m apart embedded in cement concrete block 1:3:6 (1 cement : 3 sand : 6 stone aggregate) of size 25 x 25 x 60 cm and using 12 horizontal lines and 2 diagonals barbed wire fixed from post to post with 'U' nails and projecting the angle post 2cm above the top most wire including earthwork complete.	Rm	276.50		
13.00	DISMANTLING AND DEMOLISHING				
13.01	Demolishing cement concrete manually/by mechanical means including disposal of material within 50 metres lead as per direction of Engineer-in-charge.				
	Nominal concrete 1:4:8 or leaner mix	Cum	55.00		
13.02	Demolishing R.C.C. work manually/by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 meters lead as per direction of Engineer-incharge.	Cum	248.00		

13.03	Extra for cutting reinforcement bars in R.C.C. or R.B. work (Payment shall be made on the cross sectional area of R.C.C. or R.B. work)	Sqm	183.00		
13.04	Extra for scrapping, cleaning and straightening reinforcement from R.C.C. or R.B. work	kg	11772.00		
13.05	Demolishing brick work manually/by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead:				
	In cement mortar	Cum	31.00		
13.06	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. and stacking within 50 metres lead:				
	Of area 3 Sq. metres and below	no	1.00		
	Of area beyond 3 sq. metres	no	1.00		
13.07	Dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc. including dismembering and stacking within 50 metres lead.	kg	16410.00		
	Total of sub-head	(13)			
14.00	ALUMINIUM WORK				
14.01	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up 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 hold fasteners including necessary filling up of gaps at junctions, at top, bottom and sides with required				

	PVC/neoprene flt etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing/panelling, C.P. brass/ stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing and panelling to be paid for separately). For fixed portion				
(i)	Powder coated	Sqm	83.00		
14.02	For shutters of doors, windows and ventilators including providing and fixing hinges/pivots and making provision for fixing of fittings wherever required including the cost of PVC/ neoprene gasket required. (Glazing to be paid for separately).				
a)	Powder coated	Sqm	5.00		
14.03	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 the directions of Engineer-in-charge.				
	With glass panes of 5.50 thickness	Sqm	83.00		
	Frosted glass of 4.00 mm thickness	Sqm			
14.04	Providing and fixing double action hydraulic floor spring of approved brand and manufacture IS: 6315 market, Hardwyn make (model 3000) or equivalent for doors including cost of cutting floors as required, embedding in floors and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge.				
	With stainless steel cover plate	no	2.00		

14.05	Filling the gap in between aluminium frame & adjacent RCC/Brick/Stone work by providing weather silicon sealant over backer rod of approved quality as per architectural drawings and directions of Engineer-in-charge complete. Upto 5mm depth and 5 mm width.	Metre	276.00		
	Total of sub-head	(14)			
15.00	WATER PROOFING				
15.01	Applying double coated cement slurry with water proofing chemical (SUPER latex chemical) in proportion 1 : 4 : 7 (1latex : 4water : 7 cement) including cleaning the treated surface with brushes etc. @ 0.158kg/sqm.	sqm	225.00		
15.02	Extra for providing and mixing water proofing chemical (latex or equivalent) @ 2kg per bag of cement in -				
	20mm cement plaster 1:3 (1cement : 3 sand)	sqm	3358.00		
15.03	Applying double coated top seal (cement based polymer modified water proofing slurry coating on the surface of cement concrete for prevention of water infiltration and dampness in water tanks, basement, terraces, etc.) @ 3 kg per sqm.	Sqm	262.00		
15.04	Providing and mixing grade 703 W or equivalent for reducing capillary water absorption, efflorescence, dirt penetration, growth of algae and fungi etc. On new works such as roofs, water tanks, foundations etc. , in two coats :	Sqm	262.00		
	Total of sub-head	(15)			
16.00	HORTICULTURE & LANDSCAPING				

16.01	Trenching in ordinary soil upto a depth of 60 cm including removal and stacking of serviceable materials and then disposing off by spreading and neatly levelling within a lead of 50 m and making up the trenched area to proper levels by filling with earth or earth mixed with sludge and/or manure before and after flooding trench with water (excluding coat of imported earth, sludge or manure).	cum	449.00		
16.02	Supplying and stacking of good earth at site including royalty and carriage upto 1 km (earth measured in stacks will be reduced by 20% for payment).	cum	150.00		
16.03	Supplying and stacking at site dump manure from approved source, including carriage upto 5 km lead complete (manure measured in stacks will be reduced by 8% for payment).				
	Screened through sieve of I.S. designation 4.75 mm	cum	75.00		
16.04	Rough dressing the trenched ground including breaking clods.	100 sqm	14.97		
16.05	Fine dressing the ground	100sqm	14.97		
16.06	Spreading of sludge, dump manure or/and good earth in required thickness (Cost of sludge, dump manure or/and good earth to be paid separately).	cum	150.00		
16.07	Grassing with selection No.1 grass including watering and maintenance of the lawn for 60 days or more till the grass forms thick lawn, free from weeds and fit for mowing including supplying good earth, if needed (the grass and good earth shall be paid for separately).				
	In rows 5 cm apart in both direction	100 sqm	14.97		

16.08	Making tree guard 53 cm dia. And 1/3 high as per design from empty coal tar drums supplied free by the department or any other source including providing and fixing 2 nos.M.S. sheet rings 50x0.5 mm with rivets complete in all respects including painting inside and outside of tree guard with:				
	A coat of coal tar	no.	20.00		
	Total of sub-head	(16)			
17.00	ROAD WORK				
17.01	Compacting Original Ground				
	Compacting original ground supporting subgrade (Loosening of the ground upto a level of 500mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction)	cum	414.00		
17.02	Sub Surface Drains with Perforated Pipe (Construction of subsurface drain with perforated pipe of 100mm internal diameter of metal/asbestos cement/cement concrete/ PVC, closely jointed, perforation ranging from 3mm to 6mm depending upon size of material surrounding the pipe, with 150mm bedding below the pipe and 300mm cushion above the pipe, cross section of excavation 450x550mm. Excavated material to be utilised in roadway at site.	metre	142.00		
17.03	Granular Sub-Base (Table:- 400-1)				
	By Mix in Place Method (Construction of granular sub-base by providing the material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401)				
	for Grading-I Material	cum	207.00		

17.04	Water Bound Macadam (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.)	Cum	163.00		
	By Manual Means				
	Grading - 1 (63 mm to 45 mm)				
	Using Screening Type-A (13.2mm Agg.)	Cum	104.00		
	Grading - 2 (53 mm to 22.4 mm)				
	Using Screening Type-B (11.2mm Agg.)	Cum	104.00		
17.05	Footpaths and Separators (Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, over laid with precast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel.)	sqm	138.00		
	Prime Coat				
	(i) Low porosity				
17.06	Tack coat (Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at required rate on the prepared bituminous/granular surface cleaned with mechanical broom.)				
	Normal Bituminous Surface	sqm	1378.00		
17.07	20mm thick Open-Graded Premix Carpet using Bituminous (penetration grade/modified bitumen) Binder				

	Providing, laying and rolling of open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 80-100 kN static roller capacity, finished to required level and grades to be followed by seal coat Type B as per Technical Specification Clause 508.				
	Case-II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion	Sqm	1378.00		
17.08	Seal Coat (Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats)				
	Using Bitumen 60/70 grade	Sqm	1378.00		
	Case - I : Type A				
17.09	Cast in Situ Cement Concrete M20 kerb (Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408)				
	Using Concrete Mixer	metre	458.00		
17.10	Loading and unloading of Lime, Aggregates, Stone boulder, Brick Aggregates etc. by manual means				
	i) Loading of aggregates	Cum	525.00		
	ii) Loading of sand	Cum	88.00		

17.11	Loading and Unloading of Bitumen by Manual Means	Ton	4.50		
17.12	Haulage excluding Loading and Unloading				
	Haulage of materials by tipper excluding cost of loading, unloading and stacking				
	Case-I : Surfaced road				
	a) Sand : Bagha to Work Site	Ton/Km	161.00		
	b) Aggregates: Hlimen quarry to work site	Ton/Km	914.00		
	c) Bitumen: Zuangtui to work site	Ton/Km	4.50		
	Note : Material quantity workout sheet attached				
	Total of sub-head	(17)			
18.00	SEPTIC TANK (2 X 50 USERS)				
18.01	Earth work in excavation by mechanical means (exceeding 30 cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by engineer-in-charge.				
	All kinds of soil (excluding ordinary & hard rock)	Cum	105.32		
18.02	Providing and laying in position cement concrete of specified grade excluding cost of centring and shuttering -All work upto plinth level				
	1: 4 :8 (1 cement : 4 course sand : 8 stone aggregate 40 mm nominal size)	Cum	3.47		

18.03	Providing and laying in position machine batched and machine mixed design mix M-20 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but 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 as per direction of Engineer-in-charge. "(Note:Cement content considered in this item is @ 330 kg/cum." Excess/less cement used as per design mix is payable/recoverable separately).				
	All work upto foundation & plinth level.	Cum	4.58		
18.04	Extra for providing richer or leaner mixes respectively at all floor levels.				
	Providing M-25 grade concrete instead of M-20 grade BMC/RMC. (Note:- Cement content considered in M-25 is @ 330 Kg/cum)	Cum	4.58		
18.05	Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj, etc.	Sqm	21.62		
18.06	Steel reinforcement for RCC work includingh straighthening, cutting, bending, placing in posiiton and binding all complete.				
	Thermo-Mechanically Treated bars of grade Fe-500 or more	Kg	458.44		
18.07	First class Brickwork in foundation and plinth in :				
	In cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	14.06		

18.08	Half brick masonry with first class brick in foundation and plinth in :				
	in cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	9.92		
18.09	12 mm cement plaster 1:3 (1 cement : 3 fine sand)	Sqm	60.84		
18.10	15 mm cement plaster 1:6 (1 cement : 6 fine sand)	Sqm	59.56		
	Total of sub-head	(18)			
19.00	UG TANK & RAIN WATER STORAGE TANK				
19.01	Earth work in excavation by mechanical means (exceeding 30 cm in depth, 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by engineer-in-charge.				
	All kinds of soil (excluding ordinary & hard rock)	Cum	356.15		
19.02	Providing and laying in position cement concrete of specified grade excluding cost of centring and shuttering -All work upto plinth level				
	1: 4 :8 (1 cement : 4 course sand : 8 stone aggregate 40 mm nominal size)	Cum	8.82		
19.03	Providing and laying in position machine batched and machine mixed design mix M-20 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but 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 as per direction of Engineer-in-charge. "(Note:Cement content considered in this item is @ 330 kg/cum." Excess/less cement used as per design mix is payable/recoverable separately).				
	All work upto foundation & plinth level.	Cum	68.69		
19.04	Extra for providing richer or leaner mixes respectively at all floor levels.				
	Providing M-25 grade concrete instead of M-20 grade BMC/RMC. (Note:- Cement content considered in M-25 is @ 330 Kg/cum)	Cum	68.69		
19.05	Centering and shuttering including strutting, propping etc. And removal of form for all heights				
	Foundation, footings, bases of column etc. for mass concrete.	Sqm	14.16		
19.06	Walls including attached pillasters, buttresses, string course, etc.	Sqm	361.44		
19.07	Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj, etc.	Sqm	63.36		
19.08	Steel reinforcement for RCC work includingh straightening, cutting, bending, placing in posiiton and binding all complete.				
	Thermo-Mechanically Treated bars of grade Fe-500 or more	Kg	6868.80		
19.09	Applying double coated PIDIFIN-2K or equivalent on the surface of cement concrete for prevention of water infiltration and dampness in water tanks, basement, terraces, etc.) @1.85kg per sqm.	Sqm	422.24		
	Total of sub-head	(19)			
20.00	MR Items				

20.01	Providing & Fixing 10 Passenger lift as per below given specifications:-	Each	1.00		
	Kone - Monospace or equivalent				
	Gearless Machine Room Less Lift				
	Speed - 1m/s				
	Drive - V3F				
	Nos of Stops - 3 Nos, Ground, First & Second				
	CAR Size-1100 mm (W) x 1600 mm (D)				
	CAR Ceiling & Panels - SS Hairline Finish				
	Car Flooring - Stone Finish				
	Car Illumination - LED				
	CAR Entrance - Centre Opening Power with partial height glass Door in SS Hairline Finish.				
	Door Safety - Full Height Infra red safety curtains				
	Landing Entrance - Centre Opening Power with partial height glass Door in SS Hairline Finish.				
	Clear Opening - 800mm (W) X 2000 (H)				
	Control - Full Collective Simplex				
	CAR Indicators - KDS 90 PH COP-Surface Mounted Buttons-White LED				
	Landing Indicators - KDS 90 LCI-Flush Mounted Buttons-White LED.				

<p>20.02</p>	<p>Providing and placing in position 6.7 MM thick pre-fabricated sports surface, total thickness 6.7 mm EN-428 with 1.3mm top layer, weight psqmr EN-430-3.8kg, closed sell double foam, Tech surface protection, EN14904 (Category P1), EN ISO717-2 impact sound insulation-22DB, Thermal resistance m2k/w 0.08, reaction to fire-meets European norms EN 13501-cf1-s2 formaldehyde emission-no formaldehyde, pentachlorophenol-no pentachlorophenol, Friction EN 13036-4-80-110, shock absorption EN-14808-33%, vertical dorfamation EN-14809-MM-0.8, Ball rebound EN-12235-99%, specular gloss EN-2813-<30, Dimensional stability EN-434-+-0.2%, indentation resistance EN-1516-0.19MM, resistance to rolling load EN-1569 (N)-1500, colour fastness ISO 105 B02-6, chemical resistance EN-423-no change, abrasion resistance EN ISO5470-1-mg/1000cycles-<250-T group Antimicrobial treatment-treated, Environmental attributes-solvent and heavy metal free-no periodic renewal needed. Roll form-2*15mtr. Certified by FIBA, BWF (Elite Class) & IHF.Product comes warranty for 10 years against the manufacturing defects. The work shall be carried out as per specifications, drawings and as per direction of the engineer-in-charge.</p>	<p>Sqm</p>	<p>830.00</p>		
<p>20.03</p>	<p>Supply & Laying of 5 mm Nylon investa Carpet with heavy pvc backing as per Engineer-in-charge.</p>	<p>Sqm</p>	<p>54.00</p>		

20.04	<p>Design supply & installation of suspended Spider Glazing system designed to withstand the wind pressure as per IS 875 (Part-III). The Suspended System held with Spider Fittings of SS-316 Grade Steel of approved manufacturer with glass panel having 12 mm thick clear toughened glass held together with SS- 316 Grade Stainless steel Spider & bolt assembly with laminated glass fins 21 mm thick. The Glass fins and glass panel assembly shall be connected to Slab/beams by means of SS- 316 Grade stainless steel brackets & Anchor bolts and at the bottom using SS channel of 50x25x2mm using fastener & anchor bolts, non staining weather sealants of approved make, Teflon/ nylon bushes and separators to prevent bi-metallic contacts, all complete to perform as per specification and approved drawings. The complete system to be designed to accommodate thermal expansion & seismic movements etc. The joints between glass panels (6 to 8 mm) and gaps at the perimeter & in U channel of the assembly to be filled with non staining weather sealant, so as to make the entire system fully water proof & dust proof. The rate shall include all design, Engineering and shop drawing including approval from structural designer, labour, T&P, scaffolding, other incidental charges including wastage, enabling temporary services all fitting fixers nut bolts, washer, Buffer plates, fastener, anchors, SS channel laminated glass etc. all complete. For the purpose of payment, actual elevation area of Glazing including thickness of joints and the portion of Glass panel inside the SS channel shall be measured.</p>	Sqm	82.00		
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20.05	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).	Sqm	19.00		
20.06	Boom Barrier for car: Electromechanical parking barrier with all accessories upto 6 meter length	Nos	1.00		
20.07	Providing & Fixing HDPE floor Mounted Seat of back Width 440 mm, Seat Width 440 mm Back Height 400 mm & Seat Depth 465 mm as per direction of Engineer-in-charge.	Nos	345.00		
20.08	Providing & Installation of Acrylic Signage of Powder Coated Metal Letters for " ZUANGTUI INDOOR STADIUM" Signage with Branded lighting from Backside.	Sqm	5.83		
20.09	Providing of Wooden Dormitory Beds of Size 1950 mm x 1000 mm (without stotage box) as per direction of Engineer-in-charge.	Each	11.00		
20.10	Supplying & Installation of Steel powdercoated Lockable space for players (H = 1830 , Width = 375 mm , Depth = 450 mm) as per direction of Engineer-in-charge.	Each	3.00		
20.11	Providing of Executive chairs as per direction of Engineer-in-charge. (Base Price = Rs. 5000/-)	Each	28.00		
20.12	Providing of Seating Area chairs as per direction of Engineer-in-charge. (Base Price = Rs. 4500/-)	Each	16.00		

20.13	Providing & Installation of Customized Furniture by 19 mm plyboard & premium laminate on the top, all edges should be done with edge binding tape of premium quality.	Sqm	15.00		
20.14	Providing & Installation of Conference Table (3500 x 1350 x 750 mm) by 19 mm plyboard & premium laminate on the top, all edges should be done with edge binding tape of premium quality.	Each	1.00		
20.15	Supply & installation of 20 mm thick Rubber Flooring tiles, installing with water tight joint as per direction of engineer-in-charge.	Sqm	130.29		
	Total of sub-head	(20)			

**PACKAGE – PUBLIC PLAYGROUND AND CONVENTION CENTRE AT ZUANGTUI,
AIZAWL**
SUMMARY OF COST for ELECTRICAL WORKS

Sl.No.	DESCRIPTION	AMOUNT
A	POWER SUPPLY & BACKUP	
1)	CHAPTER 1: HT CABLE & TERMINATION	
2)	CHAPTER 2: HT PANEL	
3)	CHAPTER 3: COMPACT SUBSTATION	
4)	CHAPTER 4: DG SET	
5)	CHAPTER 5: LT PANELS	
6)	CHAPTER 6 : UPS (60 KVA for Badminton Court & PA System only)	
7)	CHAPTER 7: LT CABLES & TERMINATIONS	
8)	CHAPTER 8: CABLES MANAGEMENT	
B	ELECTRICAL WIRING AND LIGHTINGS	
9)	CHAPTER 9: DISTRIBUTION BOARD	
10)	CHAPTER 10: WIRING	
11)	CHAPTER 11: EARTHING & LIGHTNING PROTECTION	
12)	CHAPTER 12: INTERNAL & EXTERNAL LIGHTING FIXTURES AND FANS	
13)	CHAPTER 13: MISCELLANEOUS WORKS	
C	SECURITY SAFETY AND PA SYSTEM	
14)	CHAPTER 14: IP BASED CCTV SYSTEM	
15)	CHAPTER 15: FIRE ALARM SYSTEM	
16)	CHAPTER-16: PUBLIC ADDRESS SYSTEM	
D	CHAPTER-17: SOLAR SYSTEM (110 KWP)	
17)	CHAPTER-17: SOLAR SYSTEM (110 KWP)	
	TOTAL AMOUNT IN RUPEES	

BILL OF QUANTITIES (ELECTRICAL WORKS)

Sl.No.	DESCRIPTION	UNIT	QUANTITY	RATE (Rs.)	AMOUNT (Rs.)
1	CHAPTER 1: HT CABLE & TERMINATION				
1.1	Supply of following size 3 core , 11KV/11KV (unearthed) grade, heavy duty XLPE insulated, FRLS type, aluminium armoured cables suitable for 11kV, 50Hz, AC system with inner and outer PVC sheath, outer sheath provided with FRLS insulation, galvanised steel flat armouring and with all components as mentioned in BOQ, specifications and schedule, complete as required.				
1.1.1	300 sq. mm	Metre	30		
1.2	Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 kV grade as required.				
1.2.1	300 sq. mm	Each	3		
1.3	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 kV grade as required.				
1.3.1	300 sq. mm	Each	1		
1.4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 kV grade but not exceeding 33KV of size not exceeding 400 sq.mm in the existing RCC/ Hume/ stoneware / metal pipes as required.	Metre	30		
	SUBTOTAL CARRIED OVER TO SUMMARY				-
2	CHAPTER 2: HT PANEL				

2.1	Design, manufacturing, assembling, wiring, testing at works, supply of HT Panel as per specifications; including supervision during installation, testing and commissioning to be carried out by other agency as per specification complete as required and comprising the following:-	Set	1		
	HT panel shall be totally enclosed, fully extendable from both sides, roll on floor type, metal clad, indoor type, dust / corrosion / vermin proof , fabricated out of CRCA / Aluzinc sheet steel throughout (thickness as per type test design), mounted upon suitable size ISMC-100 channel, properly grouted, with all necessary internal power and control wiring complete with test terminal blocks marking and ferruling including dc circuit wiring from power pack to respective panel (power pack shall be a part of HT panel and shall be included in cost), interpanel and intrapanel ac/dc circuit wiring, copper busbars of suitable ratings for phase as well as earth, metallic separations of CRCA / Aluzinc sheet (thickness as per type test design) between each switchgear and control gear compartment, approved danger and arc flash signages and with all components.				
	SUBTOTAL CARRIED OVER TO SUMMARY				-
3	CHAPTER 3: COMPACT SUBSTATION				
3.1	Design, manufacture, testing at works, supply of Compact unitized Substation, outdoor plinth mounted type, comprising following components interconnected with one another, including required interconnection with cable/ busbar and internal earthing connections complete as required and as per specifications.	Set	1		

	<p>11KV Compact secondary substation outdoor type designed for natural cooling having type tested equipment comprising distribution transformer and SF6 Gas insulated RMU compact switchgear enclosed in robotically sealed laser sealed/welded stainless steel tank, low voltage switchboard, interconnection between SF6 gas insulated Ring Main Unit and transformer using cables and transformer to LT switchgear using Al busbars/cables, factory built ready for connection type, internal earthing factory completed and other associated equipment etc. complete as required conforming to detailed specifications.</p>				
	<p>The enclosure shall have modular construction using G.I sheets and shall be painted with polyurethane paint from the exterior. The enclosure for HT & LT switchgear shall be provided with IP54 ingress protection. The transformer compartment will have IP23 ingress protection. The transformer used shall be specially designed for low losses and hermetically sealed with corrugated tank. The components to be as follow;</p> <p>Vacuum Circuit Breaker 1 No. 11KV, 630Amps. Tee-off spring assisted type Vacuum circuit breaker unit with self-actuating electronic over current and earth fault relay, fitted with fixed type voltage indicator device as per IEC 61958 and ring core type protection current transformer along with LV compartment with Multifunction meter, Bucholtz Relay, auxiliary relays for OTI (Oil Temperature Indication, WTI (Winding Temperature Indication), 4 window annunciation panel.</p> <p>Transformer: Transformer compartment comprising of outdoor type oil cooled hermetically sealed corrugated design distribution transformer 400 kVA, 11KV / 415 Volts, 3 phase, 50 Hz, Dyn11 vector group, double copper wound, distribution transformer with automatic on load tap changer (suitable for compact sub station mounting) with RTCC panel (outdoor duty) and with Thermometer with maximum indicator, Pressure relief valve, Bucholz relay, WTI, OTI. The transformer shall be mounted upon suitable MS</p>				

<p>channel,with class "A" insulation, winding temperature indicator & oil temperature indicator controller actuated by means of resistance temperature detector embedded in LV windings with approximately 4.5% impedance,on load tap changer +10 to - 10 % in the steps of 1.25 with AVR, restricted earth fault relay with suitable CT, 24V battery operated hooter (interlocked with door limit switch), lamp (interlocked with door limit switch) and other accessories complete as required. Including supplying and laying copper conductor multicore control cable from transformer to HT breaker for safety tripping complet as required.</p>			
<p>Numeric relay (1 Nos.) Numeric relay module with LCD display having following inbuilt protection functions : Over voltage, frequency , phase sequence, instantaneous overcurrent,instantaneous earth fault,overcurrent, earth fault, restricted earth fault protection of transformer, high winding temperature and high oil temperature, suitable to record and store at least 100 events with date and time with last five fault records stored in nonvolatile memory and with self supervision function, 4 spare digital binary inputs and 4 spare digital output contacts in addition to those required as per the scheme, modbus communication protocol, breaker control (on/off) along with 3No. 11kV, 15VA, CL-5P10 current transformers of suitable ratio, complete as required.</p>			
<p>The Transformer must confirm to the IS standards specified in the technical specifications.</p>			
<p>The total Transformer losses at Rated load, Voltage & frequency to be as per IS 1180 Energy Efficiency Level 2</p>			
<p>LT Compartment : 1 x 800 A, FP, 50 kA, mechanical draw out type ACB with On, Off, Trip indication and with inbuilt LSIG protection with microprocessor based release, shunt release (24V DC), inbuilt O/C & SC releases (Microprocessor based) having variable range with time lag facility to achieve discrimination. with 230V space heater with thermostat, 3-pin convenience</p>			

	outlet, a lamp along with its operating switch and door limit switch operation, three phase multifunction meter with selector switch digital type, accuracy class-0.5 (96mm X 96mm) with ethernet IP communication port & 1 set of suitable CTs, suitable for measuring THD, KVARH, KW, KWH, KVAR, PF, V, A, Hz complete required and confirming to detailed specifications.				
3.2	<p>Supply, installation, testing & commissioning of RTCC panel suitable for Remote Operation of 400 KVA 11 KV/415 Volts Transformer , made of sheet steel cabinet for indoor installation, floor mounting type. The RTCC panel shall be fabricated out of 14 SWG CRCA sheet, totally enclosed, completely dust and vermin proof and shall be with hinged doors, Neoprene gasket and padlocking arrangement. Self threading screws shall not be used in the construction of RTCC panel. A base channel of 75 mm x 40 mm x 5 mm thick shall be provided at the bottom for floor mounted panel. Panels and covers shall be properly fitted and square with the frame, and holes in the panel correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with wing nuts.</p>	Set	1		
	<p>RTCC Panel shall be complete with following accessories complete as required.</p> <p>The following components shall be provided in the RTCC panel :</p> <p>Digital Tap Position Indicating Meter</p> <p>Raise/Lower Push Buttons for Remote Control of OLTC</p> <p>Tap Change in Progress Signal Lamp.</p> <p>Supply on Signal Lamp</p> <p>Local / Remote Control Indicating Lamps</p> <p>Panel illuminating lamp with door switch.</p> <p>Space Heater with Switch and Thermostat.</p>				

	<p>Automatic Voltage Relay with Time Delay Element.</p> <p>Selectors switch for Auto/Manual Operation.</p> <p>Undrilled Gland Plate for Cable entry.</p> <p>Earthing Terminal</p> <p>Lifting Eyes Bolts.</p> <p>Suitable potential free contacts shall be provided.</p> <p>Control Cabling form RTCC Panel to Transformer.</p>				
	SUBTOTAL CARRIED OVER TO SUMMARY				-
4	CHAPTER 4: DG SET				
4.1	Supplying, installation, testing and commissioning of 500 KVA rating silent type DG set (with acoustic canopy) complete with following:	Set	1		

4.1.1	<p>Supplying, installation, testing and commissioning of 4 stroke Diesel engine of suitable BHP at 1500 rpm suitable for rated output of the alternator at site condition, capable of taking 10% overloading for one hour in any 12 hrs of running without losing its rpm complete with Dynamically balanced flywheel, direct/flexible coupling, Exhaust gas turbo charged with Cooling System, Automatic safety control in case of low lubrication oil pressure, Automatic safety control in case of high water temperature. Automatic overspeed trip protection. The engine shall have Lubrication oil pump.Lubrication oil filter.Lubrication oil cooler.Bye-pass filter,Fuel pump,Fuel Filter,Hoses for fuel tank.Air intake manifold.Air cleaner dry type. Governor EFC type. Selfstarter. Alternator for battery charging. Residential silencer. Flexible pipe for silencer. Batteries for excitation with 230 V, Single Phase, 50 HZ, AC operated Battery Charger for DG Battery charging only with Boost and trickle charging facility and protection from over charging the battery with voltmeter of range 0-50 Volts and Ammeter of range 0-50 Amp. Techometer with hour meter,Auto mains failure controller, Engine control panel as applicable & as per manufacturers standard .</p>				
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4.1.2	Supplying, installation, testing and commissioning of synchronous alternator at 1500 rpm, 3 phase ,50Hz AC supply with 0.8 pf (lagging) at site condition.The alternator shall have SPDP enclosure (IP-23), brushless continuous duty, self excited and self regulated suitable for the environmental conditions and with H class of insulation.The alternator shall be fitted with thermistors (controlled by AMC controller) for winding and bearing temperature and space heaters, AVR , battery charger for self excitation etc. complete in all respects.The alternator shall be fitted with suitable arrangement to bring out bus duct/cables of required sizes as mentioned in the SLD, along with CT for restricted earth fault protection and droop compensation .The rate shall include complete supplying, installation, testing and commissioning rates including cost of all tools and accessories (as mentioned below and any other required) required to Complete the job in full respect.				
4.1.3	1 No. 990 litre external day oil tank				
4.1.4	Piping from day oil tank to DG inbuilt fuel tank (20 m - 25mm dia)				
4.1.5	Exhaust piping as per CPCB-2 norms (20 metres approx verticle including expansion bellows, clamps and all other required accessories.				
4.1.6	Support structure for piping				
4.1.7	Lightning arrester & Aviation Obstruction lighting at the top of DG exhaust pipe - 1 Set				

4.1.8	<p>AMF Panel : Fabricating, Installing, Testing & Commissioning of outdoor type automatic mains failure control including manual by-pass panel, suitable for rated KVA silent type DG set complete with relays, timers, set of CT`s for metering & protection and energy analyser to indicate currents, phase and line voltages, frequency, power factor, KWH, KVARH & provision for overload, short circuit, restricted earth fault, under frequency, control cable & suitable size of armoured XLPE power cable of 1.1 KV grade from AMF panel to diesel engine complete in all respect and inter locking including the following:-</p>				
a.	DG Set and AMF panel shall be provided outside the building, hence nothing extra shall be paid for control and power cables up to 25 mtr. length, between DG sets and AMF panel.				
b.	Required rating MCCB - 1 Nos., Ics=Icu=Icw=36kA for 1 sec.				
c.	Auto/Manual/Test/Off selector switch.				
d.	1 Nos. over voltage relay, 1 Nos. reverse power relay and 1 Nos. under voltage relay.				
e.	Rated ON load Auto change over switch - 1 Nos.				
f.	3 nos. current transformers 15 P 10 accuracy for protection and 15 VA class- 1 for metering. - 1 Set				
g.	Energy analyser unit to indicate current voltage frequency power factor and KWH.				
h.	LED Indicating lamps for load on mains and load on DG set. - 1set				
i.	Fuse for instruments/MCB. - 1set				
j.	Battery charger, complete with transformer /rectifier, D.C. voltmeter and ammeter, selector switch for trickle, off and boost and current.				
k.	Main supply failure monitor				
l.	Supply failure timer.				
m.	Restoration timer.				
n.	Control unit with three impulse automatic engine start/stop and failure to start lockout.				
o.	Impulse counter with locking and reset facility.				

p.	ON/OFF/Control switch with indicator.				
q.	Audio/Video annunciation for High water temperature, Low lubricating oil pressure, Engine over speed, Engine fails to start, Full load / maximum load warning.				
	SUBTOTAL CARRIED OVER TO SUMMARY				-
5	CHAPTER 5: LT PANELS				
5.1	Main Isolation Panel	Set	1		
	Incoming from transformer: 1 x 800 A, FP, 50 kA, Electrically draw out type ACB with On, Off, Trip, Spring Charge indication and with inbuilt LSIG protection with microprocessor based release, shunt release (24V DC), inbuilt O/C & SC releases (Microprocessor based) having variable range with time lag facility to acheive discrimination. And required Interlocking between other incomer & Bus Coupler to be provided as per Interlocking / operation scheme indicated in Single Line diagram. The ACB shall have suitable arrangement for termination of busduct on incoming side and busbar connection at outgoing side as per single line diagram, complete with following for each incomer:				
	1 x 50kA, 2kVp (Type 1+2) surge arrester with suitable Fuse.1 x R, Y, B, On, Off, Trip, Spring charge, Service position, test position, ready to close, trip circuit healthy LED indication lamp with 2A control MCB etc. as required.1 x (16 window annunciation panel with trip, accept & reset options along with hooter)1 x (Restricted earth fault relay each with 4 nos. CL-PS, 15VA, ring type CT of required ratio)1 x (emergency Push buttons, auto/manual switch, etc. as required)1 x (3 nos. 800/1A, CL-1, 15VA, ring type CT for 240V actuated numeric type APFC relay)1 x (emergency Push buttons, auto/manual switch, etc. as required)1 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of at least THD, KVARH KW, KWH, KVAR, PF, V, A, Hz with 15VA Class 1.0 CTs of required ratio)				

	<p>Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 800 A, 36 kA for 1 sec of required length and cross sectional area.</p>				
	<p>Incoming from 500KVA DG Set - 1 nos.: 1 x 800 A, FP, 50 kA, Electrically draw out type ACB with On, Off, Trip, Spring Charge indication and with inbuilt LSIG protection with microprocessor based release, shunt release (24V DC), inbuilt O/C & SC releases (Microprocessor based) having variable range with time lag facility to achieve discrimination. And required Interlocking between other incomer & Bus Coupler to be provided as per Interlocking / operation scheme indicated in Single Line diagram. The ACB shall have suitable arrangement for termination of cable on incoming side and busbar connection at outgoing side as per single line diagram, complete with following for incomer:</p>				
	<p>1 x 50kA, 2kVp surge arrester with suitable Fuse.1 x R,Y,B,On,Off,Trip, Spring charge, Service position, test position, ready to close, LED indication lamp with 2A control MCB etc. as required.1 x (16 window annunciation panel with trip, accept & reset options along with hooter)1 x (Auxiliary contactor 6 No + 6 NC, suitable for 24 V DC.)</p>				
	<p>1 x (start/stop, trip/reset, spring charge, emergency Push buttons, auto/manual switch, test, service, trip circuit healthy, DC healthy indications etc. as required) 1 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of at least THD, KVARH KW, KWH, KVAR, PF, V, A, Hz with 15VA Class 1.0 CTs of required ratio)</p>				

	<p>1 x (IDMT based relay module with Ac inverse time overcurrent, instantaneous overcurrent relay, instantaneous earth fault relay, Overvoltage, undervoltage with dead band bypass feature, frequency, phase sequence, reverse power and earth fault relay along with 800/1A, CL-5P10, 15VA, CT) 1 x (Restricted earth fault relay with required CTs)</p>				
	<p>Micro PLC for Auto Load Management as per Logic mentioned in Single Line Diagram, comprising required Auxiliary relays (24V DC, indication lights, Push button, Emergency stop, A/M position switch, Battery charger (230V A/C / 24V DC), Batteries, Digital I/O card, analogue card, 24V DC power supply as required.</p>				
	<p>The AMF operation of DG Sets shall be carried out by controller installed on each DG Set by DG Manufacturer however required coordination and provisions to achieve the same in coordination with PLC based Auto Load Management is included in the scope of work of Panel Manufacturer.</p>				
	<p>Outgoings :</p>				
	<p>1 x 400 A, FP, 36kA, MCCB with On, Off, Trip indication and o/l, s/c & e/f protection with microprocessor based release.. 1 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of at least KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio)</p>				
	<p>1 x 250 A, FP, 36kA, MCCB with On, Off, Trip indication and o/l, s/c & e/f protection with microprocessor based release.. 1 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of at least KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio)</p>				
	<p>3 x 200 A, FP, 36kA, MCCB with On, Off, Trip indication and o/l, s/c & e/f protection with microprocessor based release.. 2 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of at least KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio)</p>				

	5 x 100 A, FP, 36kA, MCCB with On, Off, Trip indication and o/l, s/c & e/f protection with microprocessor based release.. 2 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of at least KWH, KVAR, PF, V, A, Hz with 10VA Class 1.0 CTs of required ratio)				
	3 x 63 A, FP, 36kA, MCCB with On, Off, Trip indication and o/l, s/c & e/f protection with microprocessor based release.. 2 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of at least KWH, KVAR, PF, V, A, Hz with 10VA Class 1.0 CTs of required ratio)				
5.2	Capacitor panel (150kVAR)	Set	1		
	Incomer: R,Y,B LED indication lamp with 2A control MCB. 1 x 400 A, FP, 25kA, MCCB with microprocessor based release. 1 x (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio) 1 x 12 numeric type stepped relay (APFCR) with 12 steps (each to be of 5/10/15/25/50/100 KVAR as required) for automatic power factor correction having facility to change the sequence of switching 'ON' the capacitor banks as required. The program of APFCR shall be re settable to enable sequence of ON/OFF of individual bank, so that the end unit of capacitor bank is not kept idle for long.				
	Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 400 A, 25 kA for 1 sec of required length and cross sectional area.				

	<p>Outgoings : 1 x (125 Amp, 25 kA, MCCB (TM Based) + capacity ducty contact + 7% detuned reactor + 50kVAr MPPH type heavy duy capacitor)(rated at 480V with min 66.88 kVAr @ 480V) 2 x (63 Amp, 25 kA, MCCB (TM Based) + capacity ducty contact + 7% detuned reactor + 25kVAr MPPH type heavy duy capacitor)(rated at 480V with min 33.44 kVAr @ 480V) 2 x (32 Amp, 25kA, TP, MCCB (TM Based) + capacity ducty contact + 7% detuned reactor + 15kVAr MPPH type heavy duy capacitor)1 x (25 Amp, 25kA, TP, MCCB (TM Based) + capacity ducty contact + 7% detuned reactor + 10kVAr MPPH type heavy duy capacitor)(rated at 480V with min 13.33 kVAr @ 480V) 2 x (25 Amp, 25kA, TP, MCCB (TM Based) + capacity ducty contact + 7% detuned reactor + 5kVAr MPPH type heavy duy capacitor)(rated at 480V with min 6.53 kVAr @ 480V) 3 x Spare</p>				
5.3	Fire Pump Panel -Plant Room	Set	1		
	<p>Incomer : R,Y,B LED indication lamp with 2A control MCB. 1 x 100 A, FP, 25kA, MCCB with trip settings as required. 1 x 100 A, FP, auto transfer switch with CTTS and neutral overlapping. 1 x (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio)</p>				
	<p>Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 100 A, 16 kA for 1 sec of required length and cross sectional area.</p>				
	<p>Outgoings : 3 x 40 A, FP, 16kA, MCCB with trip setting as required. 3 x 25 A, FP, 16kA, MCCB with trip setting as required.</p>				
5.4	Plumbing Panel -Plant Room	Set	1		

	Incomer : R,Y,B LED indication lamp with 2A control MCB.1 x 100 A, FP, 16kA, MCCB with trip settings as required.1 x (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio)				
	Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 100 A, 10 kA for 1 sec of required length and cross sectional area.				
	Outgoings : 12 x 16 A, FP, 10kA, MCB "C Curve". 4 x 25 A, FP, 10kA, MCB "C Curve".				
5.5	Main Distribution Board	Set	2		
	Incomer: R,Y,B LED indication lamp with 2A control MCB. 1 x 200 A, FP, 16kA, MCCB with trip settings as required. 1 x (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio)				
	Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 200 A, 10 kA for 1 sec of required length and cross sectional area.				
	Outgoings 8 x 40 A, FP, 10kA, MCB "C Curve". 10 25 A, DP, 10kA, MCB "C Curve".				
5.6	HVAC Panel (Outdoor Type)	Set	2		
	Incomer: R,Y,B LED indication lamp with 2A control MCB. 1 x 250 A, FP, 16kA, MCCB with trip settings as required. 1 x (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of KWH, KVAR, PF, V, A, Hz with 5VA Class 1.0 CTs of required ratio)				

	Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 250 A, 10 kA for 1 sec of required length and cross sectional area.				
	Outgoings : 9 x 40 A, FP, 10kA, MCB with 40A 30mA FP RCCB 3 x 25 A, FP, 10kA, MCB "C Curve". 3 x 16 A, FP, 10kA, MCB "C Curve". 2 x 40 A, DP, 10kA, MCB "C Curve".				
5.7	UPS Output Panel	Set	2		
	Incomer: 1 x R,Y,B LED indication lamp with 2A control MCB 1 x ON,OFF,Trip LED indication lamp with 2A control MCB. 1 x 200 A, TP+2N, 25kA, MCCB with thermal magnetic based release. 1 X (Digital flush type class -1.0 accuracy multifunction meter with RS-485 communication port for measurement of KWH, PF, V, A, Hz with 3X200/5A, 5VA Class 1.0 CTs)				
	Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity tinned copper in rectangular cross section and suitable for 415V, FP, 50 Hz, 250 A, 10 kA for 1 sec of required length and cross sectional area.				
	Outgoings : 4 x 63 A, FP, 10kA MCB, D Curve 8 x 40 A, FP, 10kA MCB, D Curve 10 x 25 A, DP, 10kA MCB, D Curve				
5.8	Feeder pillar (External Lighting)	Set	1		

	<p>Incomer: a) 63A 4P 16KA MCCB with microprocessor based release. b) 40 4P 16KA MCCB with thermal magnetic based release with 100A 4P Contactor. c) Digital dual channel timer with 48 hr. battery back up, with astronomical time switch auto / manual by pass switch with indicating lamp and photo sensor for operation of lights. Note: The arrangement shall be as shown in single line diagram</p>				
	<p>Busbar Section-1 (1 Set - 4P + E)-Direct Feeders Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 100 A, 10kA for 1 sec of required length and cross sectional area.</p>				
	<p>Outgoings: 3 x 40 A, FP, 10kA, MCB "C Curve". 1 x 25 A, DP, 10kA, MCB "C Curve".</p>				
	<p>Busbar Section-2 (1 Set - 4P + E)-Feeders through timer & photo sensor Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 100 A, 10kA for 1 sec of required length and cross sectional area.</p>				
	<p>Outgoings: 4 x 25 A, DP, 10kA 300mA RCB0 8 x 25 A, DP, 10kA 300mA RCB0</p>				
5.9	Supply, installation, testing and commissioning of 200 A 4P 16KA MCCB in a sheet steel enclosure suitable for indoor application with required arrangement for incoming and outgoing cable complete as required.	Set	1		
	SUBTOTAL CARRIED OVER TO SUMMARY				-
6	CHAPTER 6 : UPS AND INVERTER				

6.1	<p>Supplying, installation, testing and commissioning of 60kVA modular type (hot swapable modules, rating should be 20KVA connected in parallel in the same chassis to give desired output) the cabinet shall be suitable to house minimum 80KVA or higher, VFI (voltage frequency independent) online double conversion fully microprocessor based, indoor type, compact UPS system of mentioned rating with IGBT based PWM technology to achieve THD < 3% and input power factor of greater than 0.95 at 50% loading, suitable for three phase AC input voltage 380 V to 440 V, 50 Hz +3% / - 3 % and three phase AC output voltage 415 ± 1% volts & frequency 50 ± 0.5 Hz with all components as mentioned in BOQ, specifications and schedule, complete as required and as per technical specification. Each unit shall be comprising of the following:</p>	Set	1		
a	Fully DSP controlled power factor corrected rectifier and IGBT inverter capable of providing high quality AC power for sensitive electronic equipment loads.				
b	100% rated Inbuilt static switch at the inverter output + 2 Nos. 100% rated Inbuilt static switches at the static bypass line.				
c	100% rated Inbuilt Maintenance Bypass.				
d	Web-enabled Monitoring and Management through SNMP protocols for multi-OS environments.				
e	Supplying, unloading, installing, testing and commissioning of necessary VRLA batteries of suitable size having 15 minutes back up time to 60KVA UPS for full load (20% aging factor to be considered), Note : Concerning vendor needs to furnish the battery sizing calculations at the time of GA approval and battery size has to be as per the approved GA drawing.				
f	Supply, unloading, installation, testing & commissioning of matching cabinet/open racks to house above mentioned batteries for 60 KVA UPS system along with suitable size interconnecting cable (for UPS to Battery and battery to battery), MCCB etc. complete as required & as per specifications.				

	SUBTOTAL CARRIED OVER TO SUMMARY				-
7	CHAPTER 7: LT CABLES & TERMINATIONS				
7.1	Supplying following 1.1kV grade, XLPE insulated, FRLS type armoured/unarmoured cables suitable for 415V, 50Hz, AC system, with inner and outer PVC sheath, outer sheath provided with FRLS insulation and with all components as mentioned in BOQ, specifications and schedule, complete as required.				
7.1.1	3.5C X 300 Sqmm A2XFY.	Metre	250		
7.1.2	3.5C X 185 Sqmm A2XFY.	Metre	100		
7.1.3	3.5C X 120 Sqmm A2XFY.	Metre	100		
7.1.4	3.5C X 70 Sqmm A2XFY.	Metre	60		
7.1.5	3.5C X 50 Sqmm A2XFY.	Metre	60		
7.1.6	4C X 35 Sqmm A2XFY.	Metre	100		
7.1.7	4C X 25 Sqmm A2XFY.	Metre	400		
7.1.8	4C X 16 Sqmm 2XWY.	Metre	100		
7.1.9	4C X 10 Sqmm 2XWY.	Metre	150		
7.1.10	4C X 10 Sqmm A2XFY.	Metre	100		
7.1.11	4C X 6 Sqmm A2XFY.	Metre	350		
7.1.12	1C X 50 sqmm 2XWY	Metre	160		
7.1.13	1C X 50 sqmm 2XY	Metre	80		
7.1.14	1C X 10 sqmm 2XY	Metre	100		
7.2	Supplying following 1.1kV grade, XLPE insulated, FRLS type control cables,suitable for 415V, 50Hz, AC system, with inner and outer PVC sheath, outer sheath provided with FRLS insulation and with all components as mentioned in BOQ, specifications and schedule, complete as required.				
7.2.1	2C X 2.5 sqmm copper conductor	Metre	20		
7.2.2	4C X 2.5 sqmm copper conductor	Metre	20		

7.2.3	6C X 2.5 sqmm copper conductor	Metre	10		
7.2.4	10C X 2.5 sqmm copper conductor	Metre	20		
7.3	Laying of one number PVC insulated and PVC sheathed/XLPE power cable of 1.1kV grade of following size in the existing RCC trench / Hume pipe / pipe complete as required.				
7.3.1	Up to 35 sqmm	Metre	1,967		
7.3.2	Above 35 sqmm and up to 95 sqmm	Metre	140		
7.3.3	Above 95 sqmm and up to 185 sqmm	Metre	175		
7.3.4	Above 185 sqmm and up to 400 sqmm	Metre	140		
7.4	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.				
7.4.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	Metre	843		
7.4.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	Metre	60		
7.4.3	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	Metre	75		
7.4.4	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	Metre	60		
7.5	Supplying and making end termination with brass compression gland and aluminium / copper lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required.				
7.5.1	3.5C X 300 Sqmm A2XFY.	Each	14		
7.5.2	3.5C X 185 Sqmm A2XFY.	Each	2		
7.5.3	3.5C X 120 Sqmm A2XFY.	Each	2		
7.5.4	3.5C X 70 Sqmm A2XFY.	Each	4		
7.5.5	3.5C X 50 Sqmm A2XFY.	Each	4		
7.5.6	4C X 35 Sqmm A2XFY.	Each	10		
7.5.7	4C X 25 Sqmm A2XFY.	Each	10		
7.5.8	4C X 16 Sqmm 2XWY.	Each	4		
7.5.9	4C X 10 Sqmm 2XWY.	Each	4		

7.5.10	4C X 10 Sqmm A2XFY.	Each	20		
7.5.11	4C X 6 Sqmm A2XFY.	Each	40		
7.5.12	1C X 50 sqmm 2XWY	Each	4		
7.5.13	1C X 50 sqmm 2XWY	Each	8		
7.5.14	1C X 10 sqmm 2XY	Each	10		
7.5.15	2C X 2.5 sqmm copper conductor	Each	2		
7.5.16	4C X 2.5 sqmm copper conductor	Each	2		
7.5.17	6C X 2.5 sqmm copper conductor	Each	2		
7.5.18	10C X 2.5 sqmm copper conductor	Each	2		
7.5.19	21C X 2.5 sqmm copper conductor	Each	2		
	SUBTOTAL CARRIED OVER TO SUMMARY				
8	CHAPTER 8: CABLES MANAGEMENT				
8.1	Supplying and installing following size of perforated painted with powder coating M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc. as required.				
8.1.1	300 mm width x 50 mm depth x 1.6 mm thickness	Metre	250		
8.1.2	450 mm width x 50 mm depth x 1.6 mm thickness	Metre	100		
8.1.3	900 mm width x 75 mm depth x 2 mm thickness	Metre	20		
8.2	Supplying and installing following size of perforated painted with powder coating M.S. cable trays "bends" with perforation not more than 17.5%, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc. as required.				
8.2.1	300 mm width X 50 mm depth X 1.6 mm thickness	Each	12		
8.2.2	450 mm width x 50 mm depth x 1.6 mm thickness	Each	4		

8.2.3	900 mm width x 75 mm depth x 2 mm thickness	Each	1		
8.3	Supplying and installing following size of perforated painted with powder coating M.S. cable trays "Tee" with perforation not more than 17.5%, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc. as required.				-
8.3.1	300 mm width X 50 mm depth X 1.6 mm thickness	Each	6		
8.3.2	450 mm width X 50 mm depth X 1.6 mm thickness	Each	2		
8.3.3	900 mm width x 75 mm depth x 2 mm thickness	Each	1		
	SUBTOTAL CARRIED OVER TO SUMMARY				
9	CHAPTER 9: DISTRIBUTION BOARD				
9.1	Supplying, fitting & fixing of following MCB DB in sheet steel phospatized powder painted MCB DB, with busbar neutral link , earth bar and din rail conforms to IS13032, IS 8623, BS 5486 240V or 415V 50Hz on surface or recessed including interconnection, painting, etc, as required.				
9.1.1	8 way MCB DB SP&N SD metallic door	Each	10		
9.1.2	12 way MCB DB SP&N SD metallic door	Each	7		
9.1.3	8 way (8+24) MCB DB TP&N DD metallic door	Each	4		
9.1.4	12 way (8+36) MCB DB TP&N DD metallic door	Each	4		
9.2	Supplying and fixing 20 A, 415 V, TPN Industrial type socket outlet, with 4 pole and earth, metal enclosed plug top alongwith 20 A, "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	Each	2		

9.3	Supplying and fixing 20 A, 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top alongwith 20 A, "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	Each	1		
	SUBTOTAL CARRIED OVER TO SUMMARY				
10	CHAPTER 10: WIRING				
10.1	Light / Ceiling Fan / Exhaust Fan point etc (Modular Type) Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per standard IS 694(1990) halogen free fire retardant (HFFR) 1100 voltage graded copper flexible wire stranded copper 1.5 sq.mm running inside FRLS PVC Conduit pipe heavy duty 20mm dia fixed, recess inside ceiling / floor /wall as per convenience including junction box having required no. of ways from control switch to Light / Ceiling Fan / Exhaust Fan point etc as required				
10.1.1	Light point medium point (Modular)	Point	100		
10.1.2	Light point long point (Modular)	Point	50		
10.2	Light Plug/Socket Point 5/6Amp (Modular Type) Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per standard IS 694(1990) halogen free fire retardant (HFFR) 1100 voltage graded copper flexible wire stranded copper 2.5 sq.mm running inside FRLS PVC Conduit pipe heavy duty 20mm dia fixed, recess inside ceiling / floor /wall as per convenience including junction box having required no. of ways from DB to light / plug/socket / 5/6A point etc. as required				
10.2.1	Light/Plug point medium point (Modular)	Point	30		
10.2.2	Light/Plug point long point (Modular)	Point	10		

10.3	Power Plug Socket Point 15/16Amp (Modular Type) Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per standard IS 694(1990) life shield zero halogen (ZHLS) 1100 voltage graded copper flexible wire stranded copper 4.0 sq.mm running inside FRLS PVC Conduit pipe heavy duty 20mm dia fixed, recess inside ceiling / floor /wall as per convenience including junction box having required no. of ways from DB to power plug/socket point 15/16A etc. as required				
10.3.1	Power point medium point (Modular)	Point	10		
10.3.2	Power point long point (Modular)	Point	20		
10.3.3	Power point very long point (Modular)	Point	10		
10.4	Power Plug Socket Point 20/32Amp (Modular Type) Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per standard IS 694(1990) life shield zero halogen (ZHLS) 1100 voltage graded copper flexible wire stranded copper 4.0 sq.mm running inside FRLS PVC Conduit pipe heavy duty 20mm dia fixed, recess inside ceiling / floor /wall as per convenience including junction box having required no. of ways from DB to power plug/socket point 20/32A etc. as required				
10.4.1	Power point medium point (Modular)	Point	10		
10.4.2	Power point long point (Modular)	Point	5		
10.5	Main to Submain Copper Wire (Single Phase - Two Wire) Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per standard IS 694(1990) halogen free fire retardant (HFFR) 1100 voltage graded copper flexible wire stranded copper of different sizes as mentioned below running inside FRLS PVC Conduit pipe heavy duty of difference dia fixed, recess inside ceiling / floor /wall as per convenience including junction box having required no. of ways from main to submain/db to SBD/Switchboard SDB to switchboard etc as required				

10.5.1	2 x 2.5 sq.mm. + 1 x 2.5 sq.mm. earth wire.	Point	150		
10.5.2	2 x 4 sq.mm. + 1 x 4 sq.mm. earth wire.	Point	400		
10.5.3	2 x 6 sq.mm. + 1 x 6 sq.mm. earth wire	Point	280		
10.5.4	2 x 10 sq.mm. + 1 x 10 sq.mm. earth wire.	Point	50		
10.6	Main to Submain Copper Wire (Three Phase - Four Wire) Wiring in looping system with PVC wire sheathed standard copper conductor/wires as per standard IS 694(1990) halogen free fire retardant (HFFR) 1100 voltage graded copper flexible wire stranded copper of different sizes as mentioned below running inside FRLS PVC Conduit pipe heavy duty of 25/32/40/50mm dia fixed, recess inside ceiling / floor /wall as per convenience including junction box having required no. of ways from main to submain/db to SBD/Switchboard SDB to switchboard etc as required				
10.6.2	4 x 4 sq.mm. + 2 x 4 sq.mm. earth wire.	Metre	80		
10.6.3	4 x 6 sq.mm. + 2 x 6 sq.mm. earth wire	Metre	160		
10.6.4	4 x 10 sq.mm. + 2 x 10 sq.mm. earth wire.	Metre	150		
10.6.5	4 x 16 sq.mm. + 2 x 16 sq.mm. earth wire.	Metre	150		
10.7	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
10.7.2	25 mm	Metre	800		
10.7.3	32 mm	Metre	100		
10.7.4	40 mm	Metre	50		
10.7.5	50 mm	Metre	50		
10.8	Supplying and fixing of following sizes of FRLS PVC conduit along with accessories in surface/recess including painting of conduit in case of surface, cutting the wall and making good the same in case of recessed conduit as required.				
10.8.1	20 mm	Metre	50		

10.8.2	25 mm	Metre	300		
10.8.3	32 mm	Metre	100		
10.8.4	40 mm	Metre	20		
10.8.5	50 mm	Metre	20		
10.9	Supplying and fixing modular switch board (decorative type) round mechanism of following sizes / modules on surface or recessed including PVC/Steel boxes, modular plate and necessary switches plug/socket and fan regulator etc. with necessary painting if necessary				-
10.9.1	2S	Each	80		
10.9.2	1S 2M	Each	25		
10.9.3	1S 2M 20 Amp DP with indicator	Each	30		
10.9.4	2S 1M two way	Each	2		
10.9.5	Multistandard Socket 6/10/13A 2/3 pin	Each	20		
10.9.6	Modular information socket Cat-6 UTP	Each	20		
10.9.7	Modular stepped fan regulator 100W humming free 2M	Each	20		
10.9.8	3S	Each	70		
10.9.9	3S 20A	Each	20		
10.9.10	4S	Each	10		
10.9.11	2S + 1R 100W (2M)	Each	10		
10.9.12	2S + 4S with indicator	Each	5		
10.9.12	6S	Each	5		
10.9.12	8S	Each	5		
10.9.12	6S + 1R 100W (2M)	Each	2		

10.10	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required.	Each	80		
10.11	Providing and fixing M.S. Fan clamp type I or II of 16 mm dia M.S. bar, bent to shape with hooked ends in R.C.C. slabs or beams during laying, including painting the exposed portion of loop, all as per standard design complete as required.	Each	30		
10.12	Providing and fixing circular/ Hexagonal cast iron or M.S. sheet box for ceiling fan clamp, of internal dia 140 mm, 73 mm height, top lid of 1.5 mm thick M.S. sheet with its top surface hacked for proper bonding, top lid shall be screwed into the cast iron/ M.S. sheet box by means of 3.3 mm dia round headed screws, one lock at the corners. Clamp shall be made of 12 mm dia M.S. bar bent to shape as per standard drawing.	Each	30		
10.13	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required.	Metre	800		
	SUBTOTAL CARRIED OVER TO SUMMARY				
11	CHAPTER 11: EARTHING & LIGHTNING PROTECTION				
11.1	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/coke and salt as required.	Each	6		
11.2	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and water pipe etc. but without charcoal/ coke and salt complete as required.	Each	8		

11.3	Earthing with Copper earth plate 300 mm X 300 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and water pipe etc. but without charcoal/ coke and salt complete as required.	Each	4		
11.3	Extra for salt & charcoal for GI or Copper plate electrode complete as required.	Each	12		
11.4	Supplying and laying of 6 SWG G.I. wire at 0.5m below ground level for conductor earth electrode including soldering etc. as required.	Metre	300		
11.4	Supplying and laying of 6 SWG G.I. wire on surface or in recess for loop earthing etc. as required	Metre	100		
11.5	Supplying and laying of 25mmx5mm G.I. strip at 0.5m below ground level for conductor earth electrode including soldering etc. as required (25mmx5mm G.I. (1 KG/M)	Metre	340		
11.5	Supplying and laying of 25mmx5mm G.I. strip on surface or in recess for loop earthing etc. etc. as required (25mmx5mm G.I. (1.KG/M)	Metre	300		
11.7	Supplying and laying of 25mmx5mm copper strip in 40mm GI pipe for connection with earth electrode. (25mmx5mm copper (1.15 KG/M)	Metre	20		
11.7	Supplying and laying of 25mmx5mm G.I strip in 40mm GI pipe for connection with earth electrode. (25mmx5mm copper (1.00 KG/M)	Metre	20		
11.9	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong (one finger system) at top, with 85 mm dia 3 mm thick G.I. base plate including holes etc. complete as required.	Each	6		
11.10	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or on surface of wall for lightning conductor complete as required. (For Horizontal run)	Each	225		
11.11	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or on surface of wall for lightning conductor complete as required. (For vertical run)	Set.	100		

11.12	Providing and fixing testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 Nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.	Metre	6		
	SUBTOTAL CARRIED OVER TO SUMMARY				-
12	CHAPTER 12: INTERNAL & EXTERNAL LIGHTING FIXTURES AND FANS				
	Notes:				
a	The fixtures shall be suitable for single phase, 50 Hz, 230 Volts, A.C. supply system.				
b	All fixtures shall be factory wired with copper conductor wires.				
c	All fixtures shall be supplied with Drivers, lamps/bulbs, as specified.				
d	The rate shall be quoted for the Catalogue no. specified for the fixture however if contractor wants to supply equivalent then sample shall have to be got approved from Architect before procurement.				
e	Any loss & damage during transportation shall be in scope of Electrical Contractor till final testing & commissioning.				
g	The Lighting Fixture supplier will be responsible for ensuring that lighting fixture is fixed properly as per their requirement.				
h	The fixing of lighting fixtures shall include all fixing accessories that are required to make the installation complete in all respects including the following :-				
i	Providing connecting wires and channel support wherever required.				
ii	Internal wiring between accessories.				
iii	Self interlocking connector blocks for connecting the wires from fixtures to the points.				
iv	Earthing of fixtures with PVC insulated copper conductor FRLS wire.				
v	Approved colour powder coated down rods, clamps and other components and fixing accessories wherever required.				
vi	Testing of fixtures before Installation.				
vii	Identification tags with a distance not more 3 meters to be used for circuit				

	identification				
12.1	Supply of 2'x2' 36-40W recess mounting type LED luminaire, IP 20 ,colour temperature 5700K having efficacy not less than 100 lm/W CRCA housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture similar to WIPRO CAT : CRCO10R038HP57GL1 or equivalent	Each	10		
12.2	Supply of 15W-20W surface mounting type circular downlighter LED luminaire, IP 20 ,colour temperature 5700K having efficacy not less than 85 lm/W, THD \leq 20%, die cast aluminium/polycarbonate housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture Similar to Wipro Cat No.: LD80-171-XXX-60-SM or Equivalent	Each	20		
12.3	Supply of 10W-12W recess mounting type LED luminaire, IP 20 ,colour temperature 5700K having efficacy not less than 80 lm/W, THD \leq 20%, die cast aluminium/polycarbonate housing housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture Similar to Wipro Cat No.: LD06-151-XXX-57-XX or Equivalent	Each	180		
12.4	Supply of 15W-20W recess mounting type circular downlighter LED luminaire, IP 20 ,colour temperature 5700K having efficacy not less than 85 lm/W, THD \leq 20%, die cast aluminium/polycarbonate housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture Similar to Wipro Cat No.: LD06-221-XXX-57-XX or Equivalent	Each	80		

12.5	Supply of 1 ft linear 7-10W surface mounting type LED luminaire, IP 20 ,colour temperature 5700K having efficacy not less than 100 lm/W, THD \leq 20%, PC / PMMA housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture similar to WIPRO CAT : LL20-111-XXX-65-NE3 or Equivalent	Each	15		
12.6	Supply of 4 ft linear 18W-20W surface mounting type LED luminaire, IP 20 ,colour temperature 5700K having efficacy not less than 100 lm/W, THD \leq 20%, PC / PMMA housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture similar to WIPRO CAT : LL20-111-XXX-65-NE3 or Equivalent	Each	30		
12.6	Supply of 4 ft linear 18W-20W surface mounting type LED luminaire, IP 65 ,colour temperature 5700K having efficacy not less than 100 lm/W, THD \leq 20%, PC / PMMA housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture similar to WIPRO CAT : LL20-221-XXX-65NE3 or Equivalent	Each	110	110	12,100.00
12.7	Supply of linear bulk head light 9W-10W surface mounting type LED luminaire, IP 65 ,colour temperature 5700K having efficacy not less than 70 lm/W, THD \leq 10%, die cast aluminium housing, suitable diffuser, inbuilt electronic driver, including 3 core 1.5 sq.mm FRLS PVC insulated and PVC sheathed copper conductor cable and earthing etc. upto suitable point complete as required. Fixture similar to WIPRO CAT : LW07-141-XXX-57-XX or Equivalent	Each	10		

12.8	<p>Supply, installation, testing & commissioning of LED High Bay Luminaire consuming a system wattage of 80W ($\pm 10\%$) & the luminaire shall be with system efficacy $\geq 130\text{lm/W}$. Housing: Die Cast Aluminium . IP65 with reflexor. The operating CCT shall be 6000K with CRI of ≥ 70. The luminaire shall be with BIS Registered electronic driver with input voltage range of 150 to 270V , THD $\leq 10\%$ & PF ≥ 0.9, 1,00,000 Hrs LED Life with L70 Criteria. The LED Driver shall be easily available in India for repair and service. Luminaire shall have minimum surge protection of 4KV. The luminaire shall be with following certifications: LM79 & LM80 issued by LED manufacture along with Photo Biological Safety Standard. Fixture similar to WIPRO LH21-122-060-57-XX or equivalent</p>	Each	53		
12.9	<p>Supply of BEE 5star rated 1200 sweep BEE 5 star rated ceiling fan, including wiring, the down rods of standard length (upto 30 cm) with 3x1.5 sqmm FRLS PVC insulated copper conductor single core cables etc., as required to do the job in all respect in accordance with laid specification or upto the satisfaction of engineer in charge.</p>	Each	30		
12.10	<p>Supply of 300mm size exhaust fan suitable for 230V, 50 Hz AC including modifying and finishing for hole/opening for the size of fan, MS louver/ shutter complete with frame for Ex.fan including its connection with 3x1.5 sq mm FRLS copper conductor wire with PVC sleeve, loop earthing, making the good damage complete as required to do the job in all respect in accordance with laid specification or upto the satisfaction of engineer in charge.</p>	Each	5		

12.11	<p>Supply, installation, testing & commissioning of LED Street Light Luminaire consuming a system wattage of 35W ($\pm 10\%$) & the luminaire shall be with system efficacy $\geq 110\text{lm/W}$. Housing: Die Cast Aluminium . IP66 , Optics: Lens . The operating CCT shall be 5700K with CRI of ≥ 70. The luminaire shall be with BIS Registered electronic driver with input voltage range of 150 to 270V , THD $\leq 10\%$ & PF ≥ 0.9, 50,000 Hrs LED Life with L70 Criteria.The LED Driver shall be easily available in India for repair and service. The LED shall be SMD type. Luminaire shall have minimum surge protection of 4KV. With AutoCutoff at 300V and will be normal once the supply normalise.The luminaire shall be with following certifications: LM79 & LM80 issued by LED manufacture along with Photo Biological Safety Standard. Fixture similar to Wipro Cat No.: Wipro Cat No.LR13-501-XXX-57-XX or equivalent</p>	Each	25		
12.12	<p>Supply & Installation of 3.0 mtr. long GI street light pole 4.5 mm wal thickness having 114 mm outer uniform dia. and 60.3 mm dia., 3.6 mm thick 100 mm long coller along with base plate of size 300 mm x 300 mm x 12 mm thick, suitable for mounting of 1 no. light fixture. Pole should be finished with adequate size flush door with openable chained cover in lower section with proper strengthening of cutout of door opening including necessary rubber gasket with two coats of pu paint of approved shade, supplying & fixing of suitable size SP MCB , neutral link, earth stud, heavy duty connector (suitable for 16 sq.mm terminations) complete as required. Note : 1. The pole shall be either of same make as that of street light fixture or equivalent2. The pole shall be installed in cement concrete 1:3:6 (1 cement : 3 Coarse sand : 6 graded stone aggregate of 40 mm nominal size) foundation minimum size of 0.21 cum including excavation and refilling etc. as required. Providing and fixing Foundation Bolt- M16 x 450 mm.(4Nos.) with nuts and and washer complete as required.</p>	Each	25		

	SUBTOTAL CARRIED OVER TO SUMMARY				
13	CHAPTER 13: MISCELLANEOUS WORKS				
13.1	Providing & fixing in position 1000 mm wide , Electrical Insulating Rubber Mats as per IS 15652:2006, 2 mm thick, suitable up to 11 KV , fire retardant, no effect of acids, alkalis and transformer oils, moisture proof, high tensile strength and texture finish / cloth impression (Anti slip , marking on top)	Metre	25		
13.2	Providing & fixing in position 1000 mm wide , Electrical Insulating Rubber Mats as per IS 15652:2006, 2 mm thick, suitable up to 1.1 KV , fire retardant, no effect of acids, alkalis and transformer oils, moisture proof, high tensile strength and texture finish / cloth impression (Anti slip , marking on top)	Metre	10		
13.3	Supply & fixing shock treatment chart duly mounted on a wooden frame with 5 mm thick glass as required (approx front area 1.20 Sq Metre)	Each	2		
13.4	Providing and fixing M.V danger board of 200 mm x 150 mm made mild steel at least 2 mm thick and vitreous enameled white on both sides and with inscription in single red colours on front side as required.	Each	2		
	SUBTOTAL CARRIED OVER TO SUMMARY				
14	CHAPTER 14: IP BASED CCTV SYSTEM				

14.1	Supply, Installation, Testing & Commissioning of IP Network TDN Low-Light IR Dome Camera, 1/2.7" CMOS, 2 MP @ 25fps or better, triple stream, Min. Illumination required 0.05 lux @ F1.4 (color), 120dB True WDR, Min. Pixels 1920 × 1080, triple stream, 2.7–13.5 mm motorized focus & zoom lens, BLC, HLC, 3DNR, Privacy Mask, 3 IR LEDs Smart IR with upto 30m IR distance, 128GB SD card support, IP66, IK10, PoE, H.264 High Profile and MJPEG, PoE Class 3 and 12V DC, Having Operating temp range : 0°C to 60° C. Certifications: ONVIF Profile S & Profile G compliant, UL, CSA 60950-22, CE (EN 50130-4 & EN 55022) , FCC Part 15 & RoHS compliant complete as required and as per specifications.	Each	12		
14.2	Supply, Installation, Testing & Commissioning of IP Network TDN Low-Light IR Bullet Camera, 1/2.7" CMOS, 2 MP @ 25fps or better, triple stream, Min. Illumination required 0.05 lux @ F1.4 (color), 120dB True WDR, Min. Pixels 1920 × 1080, triple stream, 2.7–13.5 mm motorized focus & zoom lens, BLC, HLC, 3DNR, Privacy Mask, 4 IR LEDs Smart IR with upto 60m IR distance, 128GB SD card support, PoE, H.264 High Profile and MJPEG, PoE Class 3 and 12V DC, IP 66, Having Operating temp range : 0°C to 60° C. Certifications: ONVIF Profile S & Profile G compliant, UL, CSA 60950-22, CE (EN 50130-4 & EN 55022) , FCC Part 15 & RoHS compliant complete as required and as per specifications	Each	4		

14.5	<p>Supply , Installation , Testing and commissioning of 16 Channel NVR (Network Video Recorder), for recording @ 1080P with 02 nos. SATA HDDs minimum 16TB storage or more (recording requirement all cameras recording at 25fps for 30 days),H.265/H.264/MJPEG/MPEG4 codec decoding, Front Control Panel with LEDs Indication, 3 nos. USB, iPhone; iPad; Android based Mobile clients, Video Export feature on USB, Search Mode: Time/Date; Alarm; Motion Detection (MD); Exact Search (accurate to a second); Smart Search, Dual HDMI Output, Alarm Input (16 nos.), Alarm Output (6 nos.), 16 POE Ports, eSATA Device, 320Mbps each Incoming & Outgoing throughput, Operating Temperature 0°C to 55°C Certification : CE, FCC & UL including fixing accessories and cable termination with required connectors/Jack including ONVIF Video management & recording software of Mirasys, Genetec & Onssi make with inbuilt video analysis enterprise level with central monitoring & unlimited client access, PTZ Control, Remote Viewing, Remote Storage, Playback. Supports JPEG, AVI, WAV export formats, Hourly schedules, Email Notification. complete as per tender specifications and as required.</p>	Each	2		
14.6	<p>Supply, installation, testing & commissioning with proper connection & termination of following size equipment rack made out of CRCA sheet to house all the control equipment complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.</p>				
14.6.1	<p>19" equipment rack - 9 U</p>	Each	4		
14.6.2	<p>19" equipment rack -24 U</p>	Each	1		
14.8	<p>Supply, installation, testing and commissioning of Layer-2 PoE Distribution Switch 12 Gigabit Ports, Rack Mountable, 4 Port Combo Port POE+ Switch including Fibre module for LAN base feature set with support to integration with CCTV, with all related hardware complete as required and as per specifications</p>	Each	1		

14.9	Supply, installation, testing and commissioning of Layer-2 PoE Distribution Switch 8 Gigabit Ports , Rack Mountable, 4 Port Combo Port POE+ Switch including Fibre module for LAN base feature set with support to integration with CCTV, with all related hardware complete as required and as per specifications	Each	3		
14.10	Supply, installation, testing and commissioning of 21" colour TFT Monitor including decodes and all accessories complete as required in accordance with laid specification or upto the satisfaction of engineer in charge complete as required and as per specifications	Each	2		
14.11	Supply installation, testing and commissioning of Desktop Computer comprising CPU, Keyboard and a mouse complete with operating system (OS) and other required software to control NVR in control room including Centralized Video Management Software as per the requirement of the successful operation of the surveillance system complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	1		
14.12	Supply & laying of Cat 6 4 pair UTP cable for CCTV's signal/power including cable gland and other required accessories shall be laid in existing conduit/cable tray etc. complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Metre	900		
14.13	Supply, installation Testing and commissioning of compatible media converter for the interconnection of switches on optical Fiber cable backbone , complete with patch cord, 3-LIU-6port,1 LIU-24Port units and junction boxes as required for integration as per specification complete as required including all support as required.	Lot	1		
14.14	Supply, Installation, Testing and Commissioning of armoured OM3 Single mode fiber optic cable for connectivity where ever required in prelaid conduits / raceways / HDPE / DWC pipes, whichever maybe available etc. as required	Metre	100		

	SUBTOTAL CARRIED OVER TO SUMMARY				
15	CHAPTER 15: FIRE ALARM SYSTEM				
	Irrespective of whether or not mentioned in the BoQ, all necessary interfaces - such as hardware including any fiber optics modules, if required and/or software - for interconnecting all fire alarm panels at site shall be provided in the system(s).				
15.1	Supply, installation, testing & Commissioning of micro processor based 2 wire fault tolerant loop, 4 loop networkable type (each loop accessing minimum 99 detectors and devices fire alarm/detection control panel. The panel shall be able to give location of all fire/fault conditions of addressable units via the address codes. Further, the panel must be able to automatically switch ON /OFFrespective control module when ever any alarm is triggered. The panel shall have rectifier, Loop cards, LCD unit to indicate Fire/Fault Signal with address and analog output, external/inbuilt printer to log all fire or fault events complete in all respects.The panel shall have a built in power supply and battery charger along with maintenance free 24 AH, 2 x 12 volt SMF Lead acid batteries capable of running for a minimum of 8 hours with battery charger complete as required.and as per specifications. The panel shall have a facility to relay a pre- recorded message to the PA system.	Each	1		
15.2	Supply, installation, testing & Commissioning of UL Listed Photo thermal multicriteria intelligent addressable smoke detector (true ceiling) , LED, Address Switch etc. complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	70		
15.3	Supply, installation, testing & Commissioning of UL Listed Photo thermal multicriteria intelligent addressable smoke detector (below false ceiling) , LED, Address Switch etc. as required to do the job complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	40		

15.4	Supply, installation, connecting, testing and commissioning of addressable rate of rise cum fixed temperature Heat Detectors with mounting base, blinking LED etc. complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	30		
15.5	Supply, installation, testing & Commissioning of UL Listed addressable Fire Alarm Hooter , (sound output of minimum 90 dB upto a distance of 10 feet) with strobe light of minimum 75 cd intensity with power supply arrangement complete as required and suitable for wall/ceiling mounting in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	15		
15.6	Supply Installtion, Testing and Commissioning of addressable Reflected Beam Smoke Detectors with short circuit isolator (inbuilt or seperate), 16 to 328 foot protection range Single-ended, reflected type design complete with emitter and receiver including connections with remote test features etc complete as required.	Each	4		
15.7	Supply, Installtion, Testing and Commissioning of Response indicator as per technical specification etc. as required.	Each	40		
15.8	Supply, installation, testing & Commissioning of UL Listed addressable dual action manual call station to initiate audio alarm with a breakable glass cover/resettable addressable type complete as required to do the job in all respect in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	15		
15.9	Supply, installing, testing and commissioning of addressable type Fault Isolators for isolating shorted, de wired and loose circuits between two successive fault isolators with automatic resetting arrangement complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	15		

15.10	Supply, installation, testing & Commissioning of UL Listed addressable monitor module complete as required in accordance with laid specification or upto the satisfaction of engineer in charge. (For monitoring of sprinkler flow switch, Developer Fire panel, Water leak Panel, Rodent Panel)	Each	10		
15.11	Supply, installation, fixing, testing and commissioning of addressable control relay module complete as required for control of for control of AHU's, AC, VRF, Hooters ,output to PA system, for integration with Access Control, Developers Fire Panel etc. complete as required and as per specifications.	Each	15		
15.12	Supplying & Fixing in position GI Box for installation of detectors on true Ceiling complete as required to do the job in all respect in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	70	-	-
15.13	Supplying & laying of 2x1.5 sqmm fire survival armoured cable, 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer sheath complete as required.	Metre	1,050		
15.14	Supply, installation, testing & commissioning of Fire Fighter's Telephone Jack complete as required.	Each	4		
15.15	Supply of fire fighter telephone handset complete as required.	Each	2		
	SUBTOTAL CARRIED OVER TO SUMMARY				-
16	CHAPTER-16: PUBLIC ADDRESS SYSTEM				
	Defination : 1. Items under this section covers complete public address system i.e. speakers, amplifiers, call station, complete wiring and its conduiting. 2. All tools and accessories required to complete the job in full respect and as per engineer in charge shall be included.				

16.1	Supply, installation, testing & commissioning with proper connection & termination of Voice Alarm Call Station having gooseneck condenser microphone with zone Selection Keys and an All-Call-Key, PTT Switch, selectable gain, speech filter and limiter for improved intelligibility, LED indication for zone selection, fault and emergency state	Each	1		
16.2	Supply, installation, testing & commissioning with proper connection & termination of Voice Alarm Controller having features like announcement to 4 zones expandable to 60 zones, built in required booster amplifier, emergency microphone on the front panel, 16 priority levels including emergency, music to selected zones can be played, upto 255 messages can be stored in the internal 16MB flash ROM, individual BGM volume control for each zone, Digital pre-recorded messages can be merged, full system supervision.	Set	1		
16.3	Supply, installation, testing & commissioning with proper connection & termination of Booster Amplifier capable of delivering required Wattage RMS power output for all speakers , built-in fan for temperature control, built in line matching transformer distortion typically < 3% @1 KHz, S/N> 80 dB complete as required.	Set	1		
16.4	Supply, installation, testing & commissioning of CD/MP3/DVD/USB player with AM/FM tuner complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	1		
16.5	Supply, installation, testing & commissioning with proper connection & termination of 19" equipment rack made out of CRCA sheet to house all the control equipment (to be installed under reception desk).	Each	1		
16.6	Supply, installing, testing and commissioning of Ceiling Mounted Speakers in true/false Ceiling with fixing accessories complete as required. Speakers shall be 2W with multi taps (0.25W, 0.5W, 0.75W and 2W) complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	100		

16.7	Supply, installing, testing and commissioning of fire panel supervised 78db-90db Wall Mounted Speakers as specified & same make as of panel. Speakers shall be 2 Watt with multi taps of (0.25W, 0.5W, 0.75W and 2W) complete as required in accordance with laid specification or upto the satisfaction of engineer in charge.	Each	10		
16.8	Supplying & drawing including termination of speaker cable single pair, 2-Core. 1.5 sq.mm Fire retardant PVC insulated copper conductor cable in the existing surface / recessed steel conduit including connections etc. complete as required.	Metre	1,200		
	SUBTOTAL CARRIED OVER TO SUMMARY				
17	CHAPTER-17: SOLAR SYSTEM (110 KWP)				
17.1	Supplying , installation, testing and commissioning of 110kWP Solar PV system, complete with polycrystalline solar PV panels, individual module level Maximum Power Point Tracking which should also be capable for advanced, real-time performance measurement of each solar modules., On grid tie inverters, ac/dc cabling along with terminations and final interconnection to main distribution panel, including integration and adequate cable upto the panel as per sld complete along with structural supports and arrangements complete as required as per technical specifications and upto the satisfaction of engineer incharge	KWP	110		
	SUBTOTAL CARRIED OVER TO SUMMARY				

PUBLIC PLAYGROUND AND CONVENTION CENTRE AT ZUANGTUI, AIZAWL**SUMMARY OF COST for PLUMBING WORKS**

SL. No.	DESCRIPTION	AMOUNT IN RUPEES
1)	CHAPTER 1: SANITARY FIXTURES AND ALLIED REQUISITES	
2)	CHAPTER 2: INTERNAL DRAINAGE	
3)	CHAPTER 3: WATER SUPPLY	
4)	CHAPTER 4: EXTERNAL STORM WATER AND SEWER	
5)	CHAPTER 5: PUMPS AND ALLIED	
	TOTAL AMOUNT IN RUPEES	

BILL OF QUANTITIES (PLUMBING WORKS)

Sl. No	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	CHAPTER 1: SANITARY FIXTURES AND ALLIED REQUISITES				
1.1	Providing and fixing vitreous china pedestal type water closet (EWC European type wc pan) with seat and lid, 10 litres low level flushing cistern including flash pipe with manually controlled device (handle over) conforming to is: 7231 with all fittings & fixtures complete ,including cutting & making good the walls wherever required .				
	White	Each	27		
1.2	Providing and fixing vitreous china Urinal flat back large 59 x 39 x 37.5cm of Parryware/ Hindware/ Cera and equivalent make with flush valve/spray with C.I or R.S brackets standard size of G.I flush pipe and C.P brass spreaders with brass unions and G.I clamps complete including painting of fittings and brackets, cutting and making good the walls and floors wherever required.				
	White	Each	14		
1.3	providing & fixing vitreous division plate 69*30cm size for urinals.				
	White	Each	16		
1.4	providing & fixing health faucet with flexible tube upto 1 meter long & holder of quality & make asapproved by engineer in charge.	Each	27		

1.5	Providing and fixing white vitreous china wash basin standard of parryware /hindware/cera & equivalent make with R,S OR C.I brackets ,15mm c.p brass pillars taps , c.p brass chain with rubber plugs,32mm c.p brass waste of standard pattern ,32mm c.p brass taps & union complete including painting & brackets cutting & making good the walls wherever required.				
	White Vitreous China Wash basin size 630x450 mm with a pair of 15 mm C. P. brass pillar taps.				
	White	Each	1		
1.6	providing & fixing CP brass 32mm size bottle trap of approved quality & make & as per the direction of engineer in charge.	Each	29		
1.7	Providing and fixing vitreous china Vanity Basins of size 56x45 (Under Counter) of Parryware/ Hindware/ Cera and equivalent make with R.S. or C.I. brackets, 15mm C.P. brass pillar taps, C.P. brass chain with rubber plugs, 32mm C.P. brass waste of standard pattern, 32mm C.P. brass traps and union complete including painting of fittings and brackets, cutting and making good the walls wherever required.				
	White				
	Vanity Basin of size 56x45 (Under Counter) with central hole basin mixer.	Each	28		
1.8	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS ;13983 with c.i brackets & stainless plug 40mm including painting of fitting & brackets ,cutting & marking good the walls wherever required :(hindware & equivalent)				
	Single Sink 610x510 mm with bowl depth of 200mm.	Each	2		

1.9	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing:	Each	29		
1.10	Providing and fixing anodised aluminium towel rail complete with brackets fixed to wooden cleats with c.p brass screws.				
	600x20mm size.	Each	4		
1.11	Providing and fixing toilet paper holder:				
	C.P. brass toilet paper holder of standard size.	Each	27		
1.12	Providing and fixing liquid soap container with C.P brass lid and brackets fixed to wooden cleats with c.p brass screws.				
	Soap dish chromium plated with brackets.	Each	29		
1.13	Providing & fixing soap dish fixed with c.p brass screws.	Each	4		
1.14	Providing and fixing brass bib cock of approved quality.				
	15mm nominal bore	Each	10		
1.15	Providing and fixing brass stop cock of approved quality.				
	15mm nominal bore	Each	8		
1.16	Providing and fixing 15mm nominal bore c.p brass angle stop cock for basin mixer & gyser points of approved quality conforming to IS:8931.				
	Class 2	Each	70		
1.17	Providing and fixing 15mm nominal bore chromium plated brass bib cock of approved quality .				
	Class 2	Each	10		
1.18	Providing and fixing 15mm nominal bore chromium plated brass pillar cock of approved quality.				

	Class 2	Each	26		
1.19	Providing and fixing c.p brass long nose bib cock of approved quality confirming to i.s standard .				
	15 mm nominal bore .	Each	4		
1.20	Providing and fixing chromium plated brass shower rose with 15 or 20mm inlet.				
	150mm dia CP brass shower rose.	Each	4		
1.21	Providing and fixing chromium plated brass angle valve 15mm nominal bore for basin and geyser points of approved quality.				
	central hole basin mixer round spout without popup waste system	Each	4		
1.22	Providing and fixing chromium plated brass wall mixer 15mm nominal bore of approved make with necessary fittings including cutting & making good the wall .				
	Wall mixer non telephonic	Each	4		
1.23	Supply, installation, testing and commisioning of C.P.cast brass twin coat hooks fixed to wooden cleats with C.P.brass screws.	Each	27		
1.24	Supply, installation, testing and commisioning of C.P. brass towel ring fixed to Wooden / PVC cleats with C.P. brass screws	Each	15		
1.25	Supply, installation, testing and commisioning of tissue paper dispenser complete including cutting and making good the walls screws. (Model No. Kimberly-Clark Aquarius Compact Hand Towel Dispenser or Equivalent)	Each	11		

1.26	<p>Supply, installation, testing and commissioning of hand drier in rugged multiple stoved, multiple grounded steel enclosure with 1 bracket for firm wall fixture, 1 meter sheathed 3 core flexible cable with 3 pin 15A plug top along with lock and key and of shade approved by engineer incharge. The hand drier shall have the following features: No. touch operation. Solid state time delay to allow user to keep hands in comfortable position. Suitable for operation on 230 V 50 Hz 15 A outlet AC supply. (Model No. Pluto Hand Dryer PHD501 or Equivalent)</p>	Each	11		
1.27	<p>Supply, installation, testing and commissioning of storage type hot water electrical vertical heaters with copper container, insulation, and stove enameled M.S. jacket, thermostatically controlled immersion heater, with pilot lamp, 15/20mm dia inlet with non return valve and 5/20mm dia outlet including making connections complete in all respects. (Wall mounted with suitable M.S. bolts and nuts).</p>				
	Capacity 10 litres	Each	2		

1.28	Supply, installation , testing & commissioning of bottled water dispenser , which will provide chilled water at 15°C cooled from 40°C inlet water at 45°C ambient. The unit shall be with manual actuation. The unit shall be with anti-microbial compound that reduces the growth of micro-organisms and mildew to protect the surfaces from discoloration, odors and degradation. Basin shall be designed to eliminate splashing and standing water. Water saver bubbler which reduces waste water by 50% and shall have flexible guard and operate between 20 and 100 PSI. Evaporator shall be high tank type and shall be encapsulated in insulation. R-134a refrigerant to be used. An adjustable thermostat having an off position shall control refrigeration system. Potable water system components shall comply with Safe Drinking Water Act Amendments, the 1988 Lead Contamination Control Act and shall be to ANSI/NSF 61 Section 9. chiller should be single phase 220 V, 50 Hz, with cooling coil, heavy gauge galvanized steel complete as required including foundation, complete as required.	Each	4		
	SUBTOTAL CARRIED TO SUMMARY				
	CHAPTER 2: INTERNAL DRAINAGE				
2.1	Providing and fixing on wall face SWR PVC soil, waste and vent pipes including jointing with rubber lubricant/cement solvent complete.				
	110mm dia.	mtr.	418.5		
	75mm dia.	mtr.	58.5		

2.2	Providing and fixing SWR PVC plain bend of required degree (87.50°) including jointing with rubber lubricant/cement solvent complete.				
	110 mm dia.	Each	148.5		
	75 mm dia.	Each	45		
2.3	Providing and fixing SWR PVC plain bend of required degree (45°) including jointing with rubber lubricant/cement solvent complete.				
	110 mm dia.	Each	22.5		
	75 mm dia.	Each	9		
2.4	Providing and fixing SWRPVC bend with access door of required degree including jointing with rubber lubricant/cement solvent complete.				
	110mm dia SWRPVC bend with access door.	Each	18		
	75mm dia SWRPVC bend with access door.	Each	18		
2.5	Providing and fixing single equal SWR PVC plain junction of required degree (T-junction) .				
	110x110x110mm.	Each	27		
	75x75x75mm.	Each	4.5		
2.6	Providing and fixing single equal SWR PVC plain junction of required degree with access door (T-junction) .				
	110x110x110mm.	Each	19.8		
	75 x 75 x 75 mm.	Each	4.5		
2.7	Providing and fixing SWRPVC plain junction of required degree with access door (Y-junction) including jointing with rubber lubricant/cement solvent.				
	110 mm Y-junction of SWRPVC with access door.	Each	22.5		
	75 mm Y-junction of SWRPVC with access door	Each	7.2		

2.8	Providing and fixing SWRPVC plain junction of required degree (Y-junction) including jointing with rubber lubricant/cement solvent.				
	110 mm Y-junction.	Each	49.5		
	75 mm 'Y' junction.	Each	10.8		
2.9	Providing and fixing SWRPVC socket including jointing with rubber lubricant/cement solvent.				
	110mm dia socket.	Each	49.5		
	75 mm dia socket.	Each	22.5		
2.10	Providing and fixing ventilation cowl including jointing with rubber lubricant/cement solvent complete.				
	110mm SWRPVC vent cowl	Each	22.5		
	75mm SWRPVC vent cowl	Each	9		
2.11	Providing and fixing W.C. connection bend type (siphon) (SWRPVC) including jointing with rubber lubricant/ solvent cement.	Each	18.9		
2.12	Providing and fixing upvc multi floor trap with floor trap grating including jointing with rubber lubricant/solvent cement.	Each	54		
2.13	Supplying, fixing, testing and commissioning of Heavy class SS grating with Cockroach proof SS strainer of approved design including setting in floor with cement mortar to match with floor finish as per architect requirement suitable for FD and FT. a) Size 100mm x 100mm	each	54		
2.14	Supplying, fixing, testing and commissioning of cast brass Floor Clean Out plug with suitable insert keys for opening, male threaded joint with G.I. socket drip seal to soil pipe / waste pipe of C.I. pipe as required complete as per drawing, approved sample and direction by Engineer-in-charge.				
	100 mm dia	Each	36		

	SUBTOTAL CARRIED TO SUMMARY				
	CHAPTER 3: WATER SUPPLY				
3.1	Providing and fixing on terrace (at all floor levels) Polyethylene storage tank of approved brand and manufacture with cover and suitable locking arrangement and making necessary connections for inlet, outlet and overflow pipes but without the fittings & the base support for tank.				
	sintex & equivalent	Lit.	50000		
3.2	Fixing water meter and stop cock in G.I. pipe line including cutting and threading the pipe and making long screws etc. complete (cost of water meter and stop cock to be paid separately).	Each	1		
3.3	Providing and fixing brass ball valve of approved quality complete with plastic floats complete.				
	15mm nominal bore	Each	10		
	20mm nominal bore	Each	5		
	25mm nominal bore	Each	15		
3.4	providing & fixing chlorinated polyvinyl chloride pipes having thermal stability for hot & cold water supply , including all cpvc plain & brass threaded fittings including bfixing the pipe with clamps at 1.00m spacing . This includes jointing of pipes & fittings with one step cpvc solvent cement & testing of joints complete as per direction of engineer in charge. (Internal Works - Exposed on wall)				
	15mm dia normal bore	mtr.	165		
	20mm dia normal bore	mtr.	230		
	25mm dia normal bore	mtr.	195		
	32mm dia normal bore	mtr.	110		
	40mm dia normal bore	mtr.	120		
	50mm dia normal bore	mtr.	85		

3.5	extra for concealed in brick & RCC works by making chases up to 7.5* 7.5 cm in walls & making good the same after housing pipes , etc.	mtr.	407		
3.6	Providing and fixing CPVC pipes having thermal stability for hot & cold water supply including all cpvc plain & brass threaded fittings . This includes jointing of pipes & fittings with one step cpvc cement solvent trenching refilling & testing of joints complete as per direction of engineer in charge. (External Works)				
	25mm dia nominal bore	mtr.	20		
	50mm dia nominal bore	mtr.	300		
3.7	Providing & Fitting Powder coated metal Strap/ holding clamps/ Clips with necessary metal fasteners and screws etc. complete				
	15/20/25 mm dia	Each	400		
	32/ 40/ 50mm dia.	Each	200		
3.8	Cutting holes upto 15*15 cm in rcc floors & roofs for passing drain pipe etc. & repairing the hole after insertion of drain pipe etc. with cement concrete (1cement: 2 coarse sand : 4 graded stone aggregate 20 mm nominal size aggregate) including finishing complete so as to make it leak proof.	Each	85		
	SUBTOTAL CARRIED TO SUMMARY				
	CHAPTER 4: EXTERNAL STORM WATER AND SEWER				
4.1	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality				
	H D - 20				
	Rectangular shape 600x600mm	each	12		

4.3	Providing and laying non-pressure NP2 class (light duty) R.C.C. 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 :				
	150 mm dia. R.C.C. Pipe	Rm	35		
	200 mm dia. R.C.C. Pipe	Rm	35		
	250 mm dia. R.C.C. Pipe	Rm	250		
	SUBTOTAL CARRIED TO SUMMARY				
	CHAPTER 5: PUMPS AND ALLIED				
5.1	Supply, installation , testing & commissioning Single/multistage monoblock pumping set with stainless steel CI stage casing and SS-304 impellers with stainless steel shaft and suction & discharge casing as per IEC standards , connected to TEFC ventilated induction motor of 2 pole, 2900 RPM, suitable for 400/440 Volts, 3 phase, 50 Hz A.C. supply with glycerin filled pressure gauge and with gunmetal isolation valves, vibration elimination pads etc. complete with base and frame, nuts and bolts.All valves, RCC foundations and foundation bolts shall be paid seperately under relevant heads as per requirement and as per instructions . The vender shall submit performance curve and technical data sheet to the consultant prior to installation. The head versus discharge curve shall be on the rising side. including termination of cables on motor.Nos. of Pumps : 2Nos (1w+1s) : Transfer PumpsFlow Rate : 2 LPS Head : 30 mtr.	Set	1		

	Nos. of Pumps : 2 Nos (1w+1s) : Irrigation Pumps Flow Rate : 3 LPS Head : 30 mtr.	Set	1		
5.2	Supply, installation, testing and commissioning of continuous duty submersible centrifugal non-clogging drainage/sewage pumps complete with 3 phase motor with all necessary protection and mechanical seal etc. complete with all ancillaries including float type level controllers, electrical control panels fabricated from 14 gauge CRCA sheet volt meter ammeter with selector switch, TPMCB, 5 VA CL : CTs, phase indicating lamps protected by 2 amp SP MCB, DOL starter, necessary wiring, cable alleys, earthing, interlocking, starter with Automatic float type level controller, provision of high level alarm, sequence timer, potential free contact to starter for connection to BAS, both pumps may run simultaneously at pre determined level. Nos. of Pumps : 2 Nos (1w+1s) : Plant Drainage Pumps Flow Rate : 5 LPS Head : 15 mtr.	Set	1		
	Nos. of Pumps : 2 Nos (1w+1s) : Irrigation Pumps in RWHP Flow Rate : 3 LPS Head : 25 mtr.	Set	1		
	SUBTOTAL CARRIED TO SUMMARY				

**PUBLIC PLAYGROUND AND CONVENTION CENTRE AT ZUANGTUI,
AIZAWL**
SUMMARY OF COST - FIRE PROTECTION WORKS

Sl. No.	DESCRIPTION	AMOUNT IN RUPEES
1)	CHAPTER 1: PUMPS	
2)	CHAPTER 2: FIRE HYDRANT PIPING AND ACCESSORIES	
3)	CHAPTER 3: FIRE EXTINGUISHERS	
	TOTAL AMOUNT IN RUPEES	

BILL OF QUANTITIES (FIRE PROTECTION WORKS)

Sl. No	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	CHAPTER 1: PUMPS				
1.1	Supply, installation, testing and commissioning of jockey pump (pressurisation pump) comprising of the following:				
	a. Horizontal mono-block Pumps, suitable for operation on 415 volts \pm 6%, 3 phase, 50 HZ A.C supply. The installation shall be complete with Flexible coupling and coupling guard, complete as required. Jockey pump shall be of stainless steel construction.				

<p>The pump head and base shall be CI GG20 construction and impellers, diffusers, shaft sleeve, seal bush & pump shaft shall be in SS 304 material. The pump shall be provided with mechanical seal The system shall be complete with necessary pressure gauge with gun metal shut off cock on delivery side (The pump should meet the condition and shall be gotten approved by the Local fire Authority).</p>				
<p>b. Squirrel cage induction motor TEFC type for operation on 415 V, 3 phase 50 HZ AC supply for the above pump with a synchronous speed of 2900 R.P.M. with flexible coupling and coupling guard etc. as required.</p>				
<p>c. Common base plate for (a) and (b) from M.S. channel as required size.</p>				
<p>d. Suitable cement concrete foundation with plaster, (design and drawing to be provided by the Contractor while the foundation will be done by others) complete with Antivibration arrangement of cushy foot mounting.</p>				
<p>For pump defined above & of duty as follows :</p>				
<p>Terrace booster Pump</p>				
<p>Flow : 900 LPM</p>				
<p>Head : 35 mts</p>	<p>Set</p>	<p>2</p>		
<p>SUBTOTAL CARRIED TO SUMMARY</p>				

	CHAPTER 2: FIRE HYDRANT PIPING AND ACCESSORIES				
2.1	<p>Providing, laying, jointing, testing and commissioning of following sizes of pipes conforming to IS-1239 with all accessories like all fittings (standard MS fitting with welded joint shall be used on the pipes) including tees, elbows, reducers, union, flanges, rubber gaskets, GI nuts bolts, washer including supporting/fixing the pipe on floor / wall /ceiling with clamps, hangers (using anchor fastners) and painting of two coats of synthetic enamel paint over two coats of primer as per specification. G.I. pipe sleeve of suitable higher size shall be provided wherever the pipes are crossing the walls/floors and sealing the sleeves with glass wool in between & fire sealent compound at either end all as per Project Manager's / Consultants requirements including cutting holes and chases in brick, RCC work and making good the same to original conditions complete in all respects. All hangers, clamps, brackets etc. shall be of galvanized iron unless specified otherwise and then supply of the same shall also be included for rates under this head.</p>				
	For wet riser System - MS `C' Heavy class pipe				
	25 mm dia	mtr.	22.5		
	65 mm dia	mtr.	5.4		
	80 mm dia	mtr.	45		
	100 mm dia	mtr.	220.5		
	150 mm dia	mtr.	27		

2.2	Providing & fixing male/female screwed end full way lever operated forged brass ball valve(PN 16) of brass body with forged brass hard chrome plated steel ball & teflon seat tested to a pressure 24 Kg / sqcm with (threaded joints) complete as required with nuts, bolts, gaskets, washers etc..				
	25 mm dia	Each	9		
2.3	Providing & fixing butterfly valve conforming to IS 13095 PN 16 (Body : Grey Cast Iron, Shaft : SS, Disc : SS, Liner : HT - EPDM) (upto 150mm dia with hand lever operation & above with gear box operation). Including rubber gasket, flanges nuts, bolts, washers & painting complete as required as per specification.(suitable for test pressure of 24 kg / sqcm)				
	150 mm dia	Each	5.4		
	100 mm dia	Each	3.6		
2.4	Providing, fixing, testing and commissioning of dual plate check valve (Body : Grey Cast Iron, Closure plate,bracket, hinge pin, washer, spring, set screw and plate : SS, seat : HT - EPDM) of pressure 16 Kg/sq.cm with flanges (test pressure of 24 kg / sqcm), Nut,bolts & washers, painting etc. complete as required.				
	100 mm dia	Each	1.8		

2.5	Providing, fixing, testing and commissioning of CI`Y' strainer for pressure of 16 kg / sq.cm with bronze perforated sheet basket including rubber gasket, flanges (test pressure of 24 kg / sqcm), nuts, bolts and washers, panting of the same complete as required and suitable for system pressure.				
	150 mm dia	Each	1.8		
2.6	Providing, fixing, testing and commissioning of Stainless steel fire hydrant single landing valve with 80 NB flanged inlet, brass spindle controlled 63 mm dia female instantaneous outlet type. G.M coupling, blank cap, chain, twist release type lug & all accessories. Conforming to IS:5290. Including fixing with anchor fastner and flanged tapping from wet riser and providing pressure gauge with ball valve with all accessories, nuts, bolts, gaskets, painting complete as required.	Each	6.3		

2.7	Providing, fixing, testing & commissioning of swinging type First Aid hose reel in red colour drum (LPCB approved) with 36.5 mts. long and 20 mm dia heavy duty rubber water hose, 20 mm dia Ball valve stop cock, terminating with G.M coupling & nozzle of 6mm outlet with shut off valve conforming to IS 8090 - 1976 complete with MS socket for tap-off, drum and brackets (including painting) for fixing on wall with anchor fastner, bolts & nuts conforming to IS:884-1969 complete as required.	Each	6.3		
2.8	Providing, fixing, testing & commissioning of Perlocating, hose pipe (as per IS : 8423) of 63 mm dia and length as described below. The hose shall be rated for burst pressure of 35.7 Kg/sqcm. Hose shall be complete with ISI marked brass male & female coupling (IS:903) bound & rivetted to hose pipe with copper rivets & 1.5 mm copper wire. (Internal fire hydrant)	Each	12.6		
2.9	Providing, fixing, testing & commissioning of 63 mm dia instantaneous pattern branch short Gun metal pipe, 19 mm dia nozzle conforming to IS 903, suitable for inter connection to hose pipe coupling complete as required.	Each	6.3		
2.10	Providing, fixing, testing & commissioning of standard firemans axe with heavy rubber handle.	Each	6.3		

2.11	Providing, fixing, testing & commissioning of dial type (100 mm) pressure gauge with isolation ball valve suitable for rating 0 to 250 PSI with no Syphon. Cost shall be inclusive of providing any short pieces, nipples, elbows etc as required.	Each	6.3		
2.12	Providing, fixing, testing & commissioning of Fire Cabinet fabricated from 40 x 40 x 5 angle iron sections and 14 gauge MS sheet with full front glass door, suitable to accommodate landing valves, 15 m long hoses, first-aid hose reel and branch pipe nozzle, fire extingui & fire mans' axe. The shutter shall be painted with one coat of primer and two or more coats of synthetic enamel paint of approved make and shade, as required (Approx 2.1 m (high) x 0.9 m (wide)x 0.6m (deep).				
	(Cost shall be inclusive of providing break glass box containing key for the cabinet along with hamer).	Each	6.3		
2.13	Providing, fixing, testing & commissioning of automatic Air release valve with 15mm dia stop cock, flanged inlet connection, pressure gauge with gun metal stop cock complete with all accessories as required and conforming to IS IS : 12992 (Part 1).	Each	1.8		

2.14	Providing and fixing of SS fire brigade 2-way connection (suction collecting head) consisting of 4 No. 63 mm dia instantaneous type male couplings with built-in swing check valves, 1 No. 150 mm dia Butterfly valve, 1 No. 150 mm dia non-return valve and 150 mm dia flanged outlet complete with bolts, nuts and rubber insertions as required and as per IS:904-1963.	Each	0.9		
2.15	Providing & fixing MS cabinet (to enclose above FB connection) fabricated from 16g MS sheet with full front glass door and locking arrangement duly painted with one coat of primer and two or more coats of stove enamel paint of approved make and shade and suitably mounted on a raised masonry platform as required (Approx 0.6m x 0.6m x 0.45m)	Each	0.9		
	SUBTOTAL CARRIED TO SUMMARY				
	CHAPTER 3: FIRE EXTINGUISHERS				
3.1	Providing & fixing ISI marked portable chemical fire extinguisher, water (gas pressure) type capacity 9 litres conforming to IS: 2878 with gun metal cap and nozzle and complete in all respects including initial fill and wall suspension brackets	Each	6.3		

3.2	Providing & fixing ISI marked (IS:2878) portable CO2 type fire extinguisher type 4.5 kg capacity. Including valve, discharge hose of not less than 10 mm dia & 1 M long complete in all respects including initial filled with CO2 gas confirming to IS:307-1966 & filled to a filling rate of not more than 0.667 and wall suspension bracket.	Each	6.3		
3.3	Providing & fixing of ABC Type, Portable Fire Extinguisher, dry powder type (Gas Cartridge) conforming to IS: 15683 : 2006 with cylinder initially fully charged with dry powder, ISI marked confirming to IS:15683 : 2006 complete with standard discharge valve with tube, CI bracket for wall mounting.				
	9 Kg	Each	6.3		
3.4	Mechanical Foam type Fire Extinguisher. In HP Mild Steel Cylinders ISI marked / approved fitted with pressure indicating gauge, internal tube, squeeze lever type valve fully charged complete in all respects including wall suspension bracket / trolley mounted and conforming to IS:910				
	9 Litres	Each	0.9		
	50 Litres (trolley mounted)	Each	0.9		
	SUBTOTAL CARRIED TO SUMMARY				