

BILL OF QUANTITIES			
<b>Project:</b>		<p style="text-align: center;"><b>PREPARATION OF ARCHITECTURAL AND ENGINEERING DESIGN CONSULTANCY SERVICE FOR DEVELOPMENT OF INFRASTRUCTURE FOR BHUTAN CIVIL AVIATION AUTHORITY</b></p>	
<b>Type of Building:</b>		OFFICE	
<b>Location:</b>		PARO INTERNATIONAL AIRPORT, PARO, BHUTAN	Works-CIVIL
<b>Date:</b>		JULY 2019	
S.N.	Description	Amount in Figures	Amount in Words
1	Clearing & grubbing		
2	Excavation in foundation trenches, etc		
3	Damp Proof Course		
3	Stone Work		
4	Concrete work		
5	RCC work		
5	Steel reinforcement		
6	Form work		
7	Brick work		
7	Doors, Windows		
8	Steel works		
9	Roofing		
9	Wood work		
10	Flooring and Tiling works		
11	Finishing		
11	External Works		
12	Plumbing work		
13	Sewerage works		
<b>TOTAL</b>			

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Project:		PREPARATION OF ARCHITECTURAL AND ENGINEERING DESIGN CONSULTANCY SERVICE FOR DEVELOPMENT OF INFRASTRUCTURE FOR BHUTAN CIVIL AVIATION AUTHORITY				
Client:		BHUTAN CIVIL AVIATION AUTHORITY				
Type of Building:		OFFICE				
Location:		PARO INTERNATIONAL AIRPORT, PARO, BHUTAN				
Date:		JULY ,2019		Estimate		Civil Works
<b>S.N.</b>	<b>BSR /2018</b>	<b>Description</b>	<b>Qty.</b>	<b>Unit</b>	<b>Rate in Nu.</b>	<b>Amount in Figures</b>
<b>1. Clearing &amp; Grubbing</b>						
1.1	CG0002	Clearing jungle including uprooting of vegetation & trees of girth <300mm & disposal within 50m of the site.	1,121.35	Sq.M		
<b>Subtotal for Earth work</b>						
<b>2.a. Earth work</b>						
2.1	EW0030	Earth work in excavation over areas, depth >300mm, width >1.5m, area >10 Sq.M on plan, including, filling, levelling, disposal of excavated earth within 50m lead and 1.5m lift & disposed soil to be neatly dressed- ordinary soil	616.74	Cu.M		
2.2	EW0106	Excavation in foundation trenches or drains, width <1.5m, area <10Sq.M. in plan, depth >300mm including Dressing and ramming, disposal of surplus soil within 50m lead & 1.5m lift.- hard soil	448.34	Cu.M		
2.3	EW0195	Filling of trenches, sides of foundations, areas to be raised etc. including compaction in layers < 200mm using selected excavated earth within lead 50m & lift 1.5m.	442.33	Cu.M		
2.4	EW0196	Providing and laying sand bedding, including watering, ramming and dressing	58.59	Cu.M		
<b>2.b Transportation of loose soil</b>						
2.5	AR	Extra for every additional lead beyond 50m up to 10km and deposit to a required location, level including dressing and levelling as per direction of Engineer in charge.	174.41	Cu.M		
<b>Subtotal for Earth work</b>						
<b>3. Damp Proof Course</b>						
3.1	EW0196	Providing and laying 150 mm thick sand bedding under floor	58.59	Cu.M		
3.2	DP0021	Providing and laying moisture barrier using plastic sheeting underlay -100 micro meter	386.07	Sq.M		
<b>Subtotal for Damp proof Course</b>						
<b>4. Stone Work:</b>						
4.1	SM0072	Providing and laying dry hand packed stone soling/course aggregate filling with hard stone	101.06	Cu.M		
<b>Subtotal for Stonework</b>						

<b>5. Concrete work</b>						
5.1	CW0005	PCC 1:3:6, 20mm aggregate and down gauge under foundation, plinth, column footing and wall bases	22.64	Cu.M		
5.2	CW0003	1:2:4(1 cement : 2 sand : 4 graded crushed rock 20mm nominal size)	57.91	Cu.M		
<b>Subtotal for Concrete work</b>						-
<b>6. RCC work</b>						
6.1	RC0001	Providing and laying RCC 1:1:2, 20mm aggregate excluding form work and reinforcement in foundation for footings and beams up to plinth	166.58	Cu.M		
6.2	RC0005	Providing and laying RCC 1:1:2, 20mm aggregate excluding form work and reinforcement in columns, Pillars, posts above plinth up to roof	74.60	Cu.M		
6.3	RC0017	Providing and laying RCC 1:1:2, 20mm aggregate excluding form work and reinforcement in beams, lintels, slabs, staircase above plinth up to roof	301.55	Cu.M		
<b>Subtotal for RCC work</b>						
<b>7. Steel reinforcement</b>						
7.1	RC0083	Providing & fixing Thermo-Mechanically Treated reinforcement bar (Yield Strength 500 MPa) for R.C.C work including cutting, bending, binding and placing in position complete	65,198.66	Kg		
<b>Subtotal for Steel reinforcement</b>						
<b>8. Form work</b>						
Form work (Providing & fixing, centering & shuttering incl. Strutting, propping etc.) and removal of formwork.						
8.1	RC0090	Foundation and plinth	513	Sq.M.		
8.2	RC0093	Columns, Pillars, posts, etc. in superstructure with Phenol bonded ply shuttering	684.15	Sq.M.		
8.3	RC0092	Beams, Lintels, Slabs, Landings, Staircases, Walls etc. in superstructure with Phenol bonded ply shuttering	2,095.84	Sq.M.		
<b>Subtotal for Formwork</b>						
<b>9. Brick work</b>						
Providing and laying second- class brick work						
9.1	BW0002+BW0012	In cement mortar 1:4 - 250mm in super structure	139.56	Cu.M		
9.2	BW0021	Providing & laying Second-Class Half-brick Masonry (150 mm) in superstructure below floor 2 level in cement mortar 1:4	1,093.75	Sq.M		
<b>Subtotal for Brick Work</b>						

10. Doors & Windows					
10.1	AR	Providing & fixing in position Anodized Aluminum windows including Shutter 6mm thick plain glass, Pelmet & curtain rod, fittings & fixtures & hold fasts as per drawing complete, including synthetic enamel paint on new work of steel (Complete with all accessories). (Inclusive of traditional RCC cornices and all painting works)			
	i)	R1	2.00	Each	
	ii)	R2	2.00	Each	
	iii)	R3	2.00	Each	
	iv)	W244	11.00	Each	
	v)	W186	3.00	Each	
	vi)	W165	1.00	Each	
	vii)	TW120	6.00	Each	
	viii)	TW80	4.00	Each	
	ix)	W80	4.00	Each	
	x)	LW1	1.00	Each	
	xi)	LW2	1.00	Each	
		Providing & fixing in position dressed wood work in frames of doors in wrought and framed with 45mm thick paneled shutters in mixed conifer and 6mm toughen glazed glass with all fittings & fixtures & hold fasts as per drawing complete (Guardian/Saint Gobain or equivalent) with lock knob for all and other fixtures and fittings for all the doors including one coat of primers and two coat of synthetic enamel paints - complete. Consultant engineer/client to approve sample quality prior to installation .(Inclusive of traditional cornices of RCC with all paintings) (Complete with all accessories)			
	i)	DW380	1.00	Each	
	ii)	DW256	1.00	Each	
	iii)	D195	2.00	Each	
	iv)	EX.D90	2.00	Each	
	v)	D90	13.00	Each	
	vi)	D75	7.00	Each	
	vii)	TD75	12.00	Each	
	viii)	GD95	10.00	Each	
	ix)	GD100	2.00	Each	
		<b>Subtotal for doors &amp; windows</b>			
11. Steel Works					
11.1	SW0022	Steel work welded, in built up sections, trusses, frame-works including cutting, hoisting, fixing and appl. priming coat of red- In tubular sections			
	i)	50 NB medium gauge in tees and rafters	6,226.57	Kg.	
	ii)	32 NB medium gauge in struts and Purlins	6,757.14	Kg.	

11.2	SW0080	Providing and fixing MS round hold-down bolts with nuts and washer plates, complete in all areas.	59.19	Kg			
11.3	SW0081	Providing & fixing bolts of various sizes including nuts & washers	120.71	Kg			
11.4	SW0090	Providing, making and fixing, M.S Gusset Plate, straps, flats, sole plates etc., complete in roof truss work	1,111.06	Kg			
11.5	MR	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 fittings the same with necessary stainless steel nuts and bolts complete, i/e fixing railing with necessary accessories and stainless steel dash fasteners, stainless steel bolts etc, of required size on the top of the floor or the side of waist slab with suitable arrangement as per approval of engineers in charge.	36.28	M			
<b>Subtotal for Steel Works</b>							
<b>12. Roofing:</b>							
12.1	MR	Providing & fixing pre-painted steel trapezoidal roofing sheets coated with Al-Zn alloys (55% Aluminum) with min. GSM-150 & 550MPA, Thermatech Solar Reflectance Technology including self-drilling fasteners (Class III) with EPDM washers, excluding the cost of purlins, rafter and trusses.(Lysaght or equivalent brand)- 24G	997.80	Sq.M			
12.2	MR	Providing & fixing pre-painted steel 600mm ridges or hips coated with Al-Zn alloys (55% Aluminum) with min. GSM-150 & 550MPA, Thermatech Solar Reflectance Technology including self-drilling fasteners (Class III) with EPDM washers, excluding the cost of purlins, rafter and trusses.(Lysaght or equivalent brand)- 24G	28.45	Mtr.			
12.3	MR	Providing & fixing 180mm PVC gutter, including brackets, bolts, nuts, washers & rain water pipes connections, excluding the cost of pipes (colour & design as per the client choice)- PRINCE or equivalent	161.53	Mtr.			
12.4	RF0192	Providing and fixing on wall face single socketed rigid PVC ( Working Pressure 4kgf per sq.cm) rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion- complete - 110mm	90.15	Mtr.			

12.5	RF0197	Providing and fixing on wall face PVC coupler for rigid rain water pipes including jointing with seal ring 75 mm leaving 10 mm gap for thermal expansion - complete - 110 mm	24.00	each		
12.6	RF0212	Providing and fixing on wall face PVC bend for rigid rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion - complete - 110 mm	8.00	each		
12.7	RF0217	Providing and fixing on wall face PVC shoe for rigid rain water pipes including jointing with seal ring leaving 10 mm gap for thermal expansion - complete - 110 mm	10.00	each		
<b>Subtotal for Roofing</b>						
<b>13. Wood works:</b>						
13.1	WW0030	Providing & fixing Eaves board (225x25mm) with moulding fitted and fixed with necessary screws - mix conifer	183.99	Mtr.		
13.2	AR	Providing & fixing traditional wooden railing including wood preservatives, all types of painting etc with complete necessary fittings and accessories - mix conifer	2.00	Each		
13.3	AR	Providing & fixing wooden Kachen, zhu and traditional cornices including wood preservatives, all types of painting and etc with complete necessary fitting and accessories - mix conifer - for Entrance Porch	1.00	Each		
13.4	AR	Providing & fixing wooden Kachen, zhu and traditional cornices including wood preservatives, all types of painting etc with complete necessary fitting and accessories - mix conifer - for Back Entrance Porch	1.00	Each		
13.5	WW0060	Providing and fixing roof framing in trusses, Dengri including hoisting, Making B shape at end etc complete. The cost should also include necessary fixtures required to attach on Tubular section & wall. - mix conifer (inclusive of wood preservatives)	1.91	cu.m		
<b>Subtotal for Wood work</b>						
<b>14. Flooring works:</b>						
14.1	MR	Providing and laying vitrified tiles 10mm thick (600x600) in floorings laid on a bed of 20mm thick cement mortar of 1:3 finished with flush pointing in white cement. - Johnson brand or equivalent	418.05	Sq.M		
14.2	MR	Providing and laying vitrified tiles in skirting(300x150) on a bed of 12mm thick cement mortar of 1:3 finished with flush pointing in white cement.	37.40	m		
14.3	MR	Providing and laying anti skid tiles 10mm thick (300x300) in floors on a bed of 20mm thick cement mortar of 1:3 finished with flush pointing in white cement.	95.47	Sq.M		

14.4	MR	Providing and laying ceramic tiles (600X300mm) in walls on a bed of 12mm thick cement mortar of 1:3 finished with flush pointing in white cement. (W/C only)	266.28	Sq.M			
14.5	FL0153	Providing & laying marble stone flooring over 20mm thick base of cement mortar 1:4, jointed with grey cement slurry mixed with pigment where necessary, rubbing & polishing complete - 20mm thick coloured marble	43.07	Sq.M			
14.6	FL0140	Providing & fixing Marble chips skirting < 300mm height top layer 6mm thick with white or black, black and white marble chips size 4mm in proportion 1:2, laid on 12.5mm thick cement plaster 1:3 base - in grey cement	5.45	Sq.M			
14.7	FL0160	Providing & laying Kota stone flooring over 20mm thick base of cement mortar 1:4, jointed with grey cement slurry mixed with pigment where necessary, rubbing & polishing complete	71.28	Sq.M			
14.8	MR	Providing & fixing 8mm thick laminated wood flooring laid over subfloor on prepared surface with glue less locking installation , AC4 - Egger brand or equivalent	416.98	Sq.M			
14.9	MR	Providing & fixing 8mm thick laminated wood skirting on wall with special adhesive , AC4 - Egger brand or equivalent	19.65	Sq.M			
14.10	MR	Providing & fixing carpet tiles 50x50mm laid over subfloor on prepared surface , PA6 - Modulys brand or equivalent	209.54	Sq.M			
14.11	WW0150	Providing & fixing wooden skirting in mixed conifer with necessary nails or screws complete - 20mm	16.07	Sq.M			
14.12	FL0176	Providing and laying Pre-Polished/ Polished Granite of approved quality and source in flooring using necessary cement bedding in C.M. 1:4 upto 20 mm thick average cement slurry for fixing the tiles with required slopes, curing, cleaning, filling the joints with pigments of similar colour and at all levels with all leads and lifts etc. complete as per directions of site in-charge and as per pattern required - 20mm thick	10.67	Sq.M			
<b>Subtotal for Flooring works</b>							
<b>15. Finishing:</b>							
15.1	PL0041	Providing and laying cement plaster , 20 mm thick 1:4 . (Outside wall) including 20mm thick raised plaster band for Rabsey bead	543.86	Sq.M			
15.2	PL0031	Providing and laying cement plaster , 15 mm thick 1:4 .(Inside wall)	2,289.96	Sq.M			

15.3	MR	Providing and applying wall putty JK or equivalent over internal plastered walls, with minimum 2 coats and mix as per manufacture specification.	2,289.96	Sq.M			
15.4	MR	Providing and applying Dulux velvet touch super premium with two coat as per specification (Colour to be specified by Client)-to internal walls	2,289.96	Sq.M			
15.5	MR	Providing and applying Dulux weathershield ultra premium with two coat as per specification (Colour to be specified by Client)-to External walls	543.86	Sq.M			
15.6	PL0011	Providing and laying cement plaster , 6mm thick 1:4 .ceiling	1,155.58	Sq.M			
15.7	MR	Providing & fixing in position false ceiling 4.5mm thick shera Flexy Board (1220x2400mm) including steel frame (T-section, ceiling angle, intermediate channel, perimeter channel, GI hanger rod, fastener screws, connecting clips etc) complete as per drawing and manufacture specification. - shera or equivalent	154.07	Sq.M			
15.8	MR	Providing & fixing in position soffit/under roof ceiling 6mm thick shera Cement Board to 50x50x3mm M.S angle frame with necessary fixtures complete as per drawing and specification. The cost should include p/f ms frame & applying priming coat of synthetic enamel at board edges.-	203.18	Sq.M			
15.9	MR	Providing & fixing in position perforated false ceiling 16mm thick (600x600mm) including steel frame (T-section, ceiling angle, intermediate channel, perimeter channel, GI hanger rod, fastener screws, connecting clips etc) complete as per drawing and manufacture specification. - Armstrong brand or equivalent	125.58	Sq.M			
15.10	AR	Providing & fixing 18mm thick Partitions particle board with Aluminum frames including 6mm thk glass for office cubical with all necessary fittings abd fixtures Complete.	70.26	Sq.M			
15.11	MR	Providing and fixing Stone cladding on wall on the bed of 20mm thick cement mortar of 1:3 finished with flush pointing in white cement.	29.47	Sq.M			
15.12	WW0300	Providing & fixing 38mm thick louvered shutters for windows, doors with fixed 12mm venetians, in Mixed Conifer.	28.64	Sq.M			
15.13	WW0525	Providing & fixing M.S. pressed butt hinges with necessary screws etc. complete	16.00	Each			
15.14	WW0537	Providing & fixing M.S tower bolt (barrel type) with necessary screws etc. complete	6.00	Each			
<b>Subtotal for Finishing</b>							
<b>16. External Works</b>							
16.1	DR0001	Providing & laying 50mm thick Plinth Protection and grouted with fine sand mix including well rammed, finishing the top smooth - With cement concrete 1:3:6, 20mm aggregates, laid over 75mm thick layer of compacted gravel (40mm)	595.00	Sq.M			



16.2	DR0012	Constructing second class brick masonry open surface drain in cement mortar 1:4 including earth work in excavation 100mm thick concrete bed 1:5:10, 40mm aggregate and 25mm thick cement concrete 1:2:4, 12mm aggregate for filling haunches 12mm cement plastering 1:4 with a floating coat of neat cement and disposal of surplus earth as per the instruction of engineer in-charge complete as per drawing. - 250mm x 300mm depth	119.00	Mtr.		
<b>Subtotal for External Works</b>						
<b>17. Plumbing work</b>						
17.1		Providing and fixing 3-layer PP-R (Polypropylene Random Copolymer) PN-16 pipes, SDR 7.4 UV Stabilized and anti-microbial fusion welded, having thermal stability for hot and cold water supply including all PP-R plain and brass Threaded Polypropylene random fittings including fixing pipe with clamps at 1.0m spacing. This includes testing of joints, cutting chases and making good the wall complete as per direction of Engineer-in- Charge. (IS and BSB approved)				
	MR	25mm	103.53	Mtr.		
	MR	20mm	72.84	Mtr.		
17.2	MR	Providing and fixing bowl basin in bright C0462 (410x365x185mm), including 32mm waste coupling, 32mm bottle trap and 450mm long connection hose, repair wall and fixtures necessary. Parryware brand or equivalent	23.00	Each.		
17.3	MR	Providing & fixing European-type vitreous china w.c pedestal including seat and lid with c.p brass hinges, 15 lit white vitreous china low level cistern, fittings, brackets, repair walls (Parryware or equivalent)	17.00	Each.		
17.4	MR	Providing and fixing kitchen sink, single bowl C853699(900x450x200mm) including all connection and fittings. - parryware or equivalent	1	Each		
17.5	MR	providing and fixing basin mixer G47115A1 including all connection and fittings. - parryware or equivalent	23	Each		
17.6	MR	providing and fixing deck mounted sink mixer,G4750A1 including all connection and fittings. - parryware or equivalent	1	Each		
17.7	PI0250	Providing & fixing 600x450mm beveled edge mirror (superior glass) incl.4mm A.C sheet base fixed to wooden cleats	5	Each		
17.8	MR	Providing and fixing ( 1400X800) mm reflection mirror including necessary fixtures and fitting-parryware or equivalent	6	Each		

17.9	MR	Providing and fixing soap dispenser T6513A1 including necessary fixtures and fitting -parryware or equivalent	17	Each			
17.10	MR	Providing and fixing toilet paper holder with cover T6514A1 including necessary fixtures and fitting -parryware or equivalent	17	Each			
17.11	MR	Providing and fixing angle valve T9926A1 STAR including necessary fixtures and fitting -parryware or equivalent	60	Each			
17.12	MR	Providing and fixing long body bib cock GA706A1 including necessary fixtures and fitting -parryware or equivalent	17	Each			
17.13	PI0253	Providing and fixing towel rail T6001A1 600mm, including complete necessary fittings and fixtures (Parryware or equivalent)	10	Each			
17.14	MR	Providing & fixing Sintex tank ( Rabten) including all accessories complete - 3000 ltr capacity	4	Each			
17.15	DR0105	Const. Brick masonry Valve Chamber in CM1:5, RC top slab with 1:2:4 20mm agg. fdn. PCC 1:3:6 40mm agg.12mm CP 1:3 finished with floating coat & making channels in cement concrete 1:2:4 20mm aggregates, neatly finished complete - Inside dimension 900 x 800mm & 450mm deep including C.I. cover & frame (weight >38 kg)	1.00	Each			
17.16		Providing & fixing Electric water heater including necessary fittings					
	PI0164	50 ltr	1.00	Each			
	PI0162	25 ltr	11.00	Each			
<b>Subtotal for Sanitary and Plumbing Works</b>							
<b>18. Sewerage works</b>							
18.1		Providing & laying H.D.P.E Pipes including H.D.P.E fittings pressure class 4 kg/sq.cm (excluding trenching, refilling & thrust block)					
	PO0050	110mm dia	126.00	Mtr.			
	PO0052	160mm dia	50.12	Mtr.			
18.2		Providing and fixing PVC soil waste and vent pipes, single/double socketed, including pipe clip complete (excluding the cost of PVC fittings)					
	MR	50mm dia	59.08	Mtr.			
	PO0370	75mm dia	126.00	Mtr.			
	PO0371	90mm dia	27.06	Mtr.			
	PO0372	110mm dia	126.00	Mtr.			
18.3		Providing & fixing P.V.C coupler					
	MR	50mm dia	10.00	each			
	PO0385	75mm dia	7.00	each			
	PO0386	90mm dia	18.00	each			
	PO0387	110mm dia	22.00	each			
18.4		Providing & fixing P.V.C plain bend					
	PO0405	75mm dia	7.00	each			
	PO0406	90mm dia	7.00	each			

	PO0407	110mm dia	7.00	each			
18.5		Providing & fixing P.V.C single T door					
	PO0445	75mmdia	7.00	each			
	PO0446	90mm dia	10.00	each			
18.6		Providing & fixing P.V.C single Y with door					
	PO0505	75MM dia	4.00	each			
	PO0507	110mm dia	4.00	each			
18.7		Providing & fixing P.V.C reducer					
	PO0397	110x90mm	10.00	each			
	MR	75x50mm	10.00	each			
18.8	MR	Providing and fixing PVC Nahani Trap/multi floor trap 50x50mm and 50x75mm - (one, two or three way)	28.00	each			
		Constructing brick masonry Manhole/Inspection chamber or inception pit in cement mortar 1:5, RCC top slab with 1:2:4, 20mm Agg. foundation concrete 1:4:8, 40mm agg, 12mm plaster in cm 1:3, finished with floating coat of neat cement and making channels in cement conc. 1:2:4, 20mm agg, neatly finished as per drawing complete.					
18.9	DR0106	Inside dimension 900 x 800mm & 600mm deep including C.I. cover & frame (weight >38 kg)	4.00	Each			
18.10	PO0621	Constructing Septic Tanks, in 2nd class brick masonry in cement mortar 1:4, including fittings, C.I cover with frame, 40mmthick concrete flooring (40mm aggregates) cement plaster concrete base in C.C 1:4:8 etc. complete as per standard design. For 25 users	1.00	Each			
<b>Subtotal for Sewerage Works</b>							