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# **BILL OF QUANTITIES**

FOR THE

**PROPOSED CONSTRUCTION OF ANIMAL HOUSE  
CENTRE**

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FOR

**CENTRE FOR BIOTECHNOLOGY AHMADU BELLO  
UNIVERSITY ZARIA**

December, 2017

**SUBSTRUCTURE****(All Provisional)****Excavation and Earthwork****Topsoil**

A	Excavate topsoil, average 150mm deep	405	m <sup>2</sup>	700.00	283,500.00
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**Excavation****Trench**

B	Excavate trench 700mm wide, starting from stripped level, exceeding 1.00 but not exceeding 2.00 metre deep.	160	m <sup>3</sup>	500.00	80,000.00
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**Pit**

C	Excavate pit for column bases, starting from stripped level exceeding 1.00 but not exceeding 2.00 metres deep.	30	m <sup>3</sup>	500.00	15,000.00
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**Filling**

D	Backfill previously excavated material around excavation, well compacted and consolidated.	57	m <sup>3</sup>	300.00	17,100.00
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E	Laterite hardcore filling not exceeding 250mm thick well compacted and consolidated.	135	m <sup>3</sup>	5,000.00	675,000.00
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F	Rock boulder hardcore filling laid in layers not exceeding 250mm thick, hand packing in 100mm layers.	68	m <sup>3</sup>	7,600.00	516,800.00
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**Disposal**

G	Remove excavated topsoil material and deposit at locations as specified off site.	24	m <sup>3</sup>	310.00	7,440.00
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H	Remove surplus excavated material and deposit at locations specified on site well spread and levelled	175	m <sup>3</sup>	310.00	54,250.00
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**To Collection****1,649,090.00**

**SUBSTRUCTURE (CONT'D)****Damp Proofing**

A	Visqueen gauge 20 polyethene damp proof membrane laid on laterite hardcore filling (measured separately).	405	m <sup>2</sup>	880.00	356,400.00
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**Concrete Work**Plain insitu concrete (1:10) in:

B	Blinding, 50mm thick, poured against face of excavation.	60	m <sup>2</sup>	2,900.00	174,000.00
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Plain insitu concrete (1:3:6 - 38mm aggregate) grade C20 in:

C	Foundation in trenches, poured against faces of excavation.	81	m <sup>3</sup>	29,000.00	2,349,000.00
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D	150mm ground slab laid on hardcore (measured separately).	61	m <sup>3</sup>	29,000.00	1,769,000.00
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Reinforced insitu concrete (1:2:4 - 19mm aggregate) grade C25 in:

E	Column bases	15	m <sup>3</sup>	32,000.00	480,000.00
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F	Columns in foundation	1	m <sup>3</sup>	32,000.00	32,000.00
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G	Ground Beams	8	m <sup>3</sup>	32,000.00	256,000.00
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**Reinforcement**High yield reinforcing bars to BS 4449 in straight and bent bars in:

H	16mm diameter bars in column bases.	945	kg	300.00	283,500.00
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J	16mm diameter bars in columns	165	kg	300.00	49,500.00
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K	25mm diameter bars in columns	770	kg	300.00	231,000.00
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L	16mm diameter in ground beams	640	kg	300.00	192,000.00
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Mild steel reinforcing bars to BS 4449 in straight and bent bars in:

M	10mm diameter stirrups in columns.	55	kg	300.00	16,500.00
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N	8mm diameter stirrups in columns.	105	kg	300.00	31,500.00
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P	8mm diameter links in ground beams.	145	kg	300.00	43,500.00
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**To Collection****6,263,900.00**

**SUBSTRUCTURE (CONT'D)****Reinforcement (Cont'd)**

Fabric Reinforcement to BS 4483, BRC Type A165 weighing 2.29kg/m<sup>2</sup> laid to 150mm side and end laps (measured nett) in:

A	Beds	405	m <sup>2</sup>	560.00	226,800.00
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**Formwork**

Sawn formwork to:

B	Sides of columns	55	m <sup>2</sup>	2,500.00	137,500.00
C	Edges of slabs not exceeding 300mm high	35	m	750.00	26,250.00

**Blockwork**

Hollow sandcrete blockwork laid stretcher bedded and jointed in cement mortar (1:3) filled solid with lean concrete in:

D	230mm walls	35	m <sup>2</sup>	4,500.00	157,500.00
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**To Collection**

**548,050.00**

**COLLECTION**

Page 1 1,649,090.00

Page 2 6,263,900.00

Page 3 548,050.00

**Additional Foundation**

300,000.00

**SUBSTRUCTURE**  
**Carried to Summary**

**8,761,040.00**



**SUPERSTRUCTURE****FRAME**

Concrete Work

Reinforced insitu concrete grade C25 in:

A	Column	2	m <sup>3</sup>	32,000.00	64,000.00
B	Beams	3	m <sup>3</sup>	32,000.00	96,000.00

**Reinforcement**High yield reinforcement bars hot rolled, deformed round bar to BS 4449, straight and bend in:

C	16mm diameter bars in columns	160	kg	300.00	48,000.00
D	12 mm diameter in beams	240	kg	300.00	72,000.00
E	20 mm diameter in beams	120	kg	300.00	36,000.00
F	16 mm diameter in beams	0	kg	300.00	-

Mild steel reinforcement bar, plain round to BS 4449, straight and bent in:

E	10mm diameter in beams	120	kg	300.00	36,000.00
F	8mm diameter in beams	120	kg	300.00	36,000.00

**Formwork**Sawn formwork to:

G	Sides of columns	140	m <sup>2</sup>	2,200.00	308,000.00
H	Sides and soffit of beams	100	m <sup>2</sup>	2,200.00	220,000.00

**FRAMES****Carried to Summary****916,000.00**

**ROOFING****Roofing Covering**

A	Long span coloured aluminium roofing sheet WB 0.55mm thick double lap fixed to steel 'Z' purlins (measured separately) including aluminium hook bolts plastic sealer washer, seal washer and seal caps all in accordance with manufacturer's details	466	m <sup>2</sup>	3,200.00	1,491,200.00
B	600mm girth ridge capping	50	m	1,900.00	95,000.00

**Roof Trusses****Concretework****Reinforced insitu concrete grade C25 in:**

C	230mm roof beam to receive 'Z' steel roof members (measured separately)	0	m <sup>3</sup>	32,000.00	-
D	Fascia	8	m <sup>3</sup>	32,000.00	256,000.00

**Reinforcement****High yield reinforcement bars hot rolled, deformed round bar to BS 4449, straight and bend in:**

E	12mm diameter bars in roof beams and Fascia	720	kg	300.00	216,000.00
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**Formwork****Sawn formwork to:**

H	Sides of roof beams and fascia	90	m <sup>2</sup>	2,200.00	198,000.00
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**Metal work**

J	2mm thick Z - purlin with and including angle cleats fixed to metal carcassing (measured separately)	450	m	6,200.00	2,790,000.00
K	Angle iron carcassing grouted in concrete at specified intervals, welded and jointed to Engineer's	40	m	5,600.00	224,000.00

**ROOFING****Carried to Summary****5,270,200.00**

**WALLS**

Hollow sandcrete blocks 450 x 230mm nominal size,  
laid stretcher, bedded and jointed in cement mortar  
(1:3) in:

A	230mm walls	600	m <sup>2</sup>	3,380.00	2,028,000.00
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**WALLS**  
**Carried to Summary**

**2,028,000.00**

**WINDOWS AND DOORS****Concrete work**Reinforced insitu concrete grade C25 in:

A	Lintels	4	m <sup>3</sup>	32,000.00	128,000.00
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**Reinforcement**Mild steel reinforcing bars to BS 4449 in straight and bent bars in:

B	12mm diameter bars in lintels	470	kg	300.00	141,000.00
C	10mm diameter stirrups in lintel	250	kg	300.00	75,000.00

**Formwork**

D	Sawn formwork to sides and soffit of lintel	205	m	660.00	135,300.00
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**Doors**Supply and fix purpose made aluminium /flush doors with and including cutting of, building-in and pinning lugs into blockwork/concrete work and treating all joints in contact with wall with mastic sealant:

E	Double leaf (outward swinging) aluminium pannelled security door size 2400 x 2100mm as with 5mm tinted glazing	2	Nr	76,000.00	152,000.00
G	Ditto but 1800 x 2100mm	2	Nr	45,000.00	90,000.00
H	900 x 2100mm ditto	10	Nr	45,000.00	450,000.00
J	750 x 2100mm finished solid core flush doors	0	Nr	25,000.00	-

**To Collection****1,171,300.00**



**WINDOWS AND DOORS (Cont'd)**

**Windows**

Supply and fix approved aluminium window with and including building-in and pinning lugs into walls and treating all joints in contact with walls with mastic sealant in:

A	1500 x 1500mm powder coated aluminium 4 leaf sliding windows with 5mm tinted glazing	8	Nr	48,000.00	384,000.00
B	900 x 900 ditto	2	Nr	48,000.00	96,000.00
C	Ditto 1500 x 1500mm overall height	4	Nr	55,000.00	220,000.00
D	Ditto 1500x900mm ditto	1	Nr	55,000.00	55,000.00
E	Ditto 900x600mm ditto	0	Nr	46,000.00	-
F	Ditto 600x600mm ditto	2	Nr	46,000.00	92,000.00
G	Ditto 1500 x 2100mm overall height		Nr	89,000.00	-

**Burglar Proof**

Supply and fix the following in approved "Black iron" steel Burglar proofing

H	Size 50mm x 50mm CSA	45	m	7,800.00	351,000.00
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**To Collection Below**

**814,000.00**

**COLLECTION**

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1,171,300.00

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814,000.00

**WINDOWS AND DOORS**

**Carried to Summary**

**1,985,300.00**

**FINISHES****WALLS**

A	15mm cement and sand (1:4) rendering, finished fair and smooth to wall internally with and including narrow widths	400	m <sup>2</sup>	1,450.00	580,000.00
B	Ditto externally	180	m <sup>2</sup>	1,450.00	261,000.00
C	Red brick facing on 13mm thick cement/sand plaster on approach elevation.	0	m <sup>2</sup>	3,100.00	-
D	White glazed wall tiles 152 x 152 x 6mm thick, jointed and pointed with matching cement mortar on floated backing, internally.	45	m <sup>2</sup>	3,200.00	144,000.00

**Backing**

E	15mm cement and sand (1:3) floated backing on sandcrete walls	0	m <sup>2</sup>	1,450.00	-
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**Painting and Decoration**

F	Prepare and apply one undercoat, one layer priming and two finishing coats of emulsion paint on rendered wall surfaces internally, including narrow widths	400	m <sup>2</sup>	800.00	320,000.00
G	Ditto but externally	180	m <sup>2</sup>	800.00	144,000.00

**FLOOR**

J	35mm cement and sand (1:3) paving trowelled smooth, treated with an approved hardener and polished with carborandium internally	810	m <sup>2</sup>	1,450.00	1,174,500.00
K	Vetrified tiles on 35mm thick cement/sand finish	810	m <sup>2</sup>	2,900.00	2,349,000.00

To Collection

4,972,500.00

**FINISHES (Cont'd)****CEILING**

A	Suspended cement gypsum and plaster of paris ceiling and conice to Architect's specification	405	m <sup>2</sup>	888.00	359,640.00
B	Ditto externally	48	m <sup>2</sup>	888.00	42,624.00
C	Approved suspended ceiling board size 600 x 600mm fixed to metal roof members internally	0	m <sup>2</sup>	4,200.00	-
D	Approved PVC ceiling externally	0	m <sup>2</sup>	800.00	-

**To Collection****402,264.00****COLLECTION**

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4,972,500.00

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402,264.00

**FINISHES**  
**Carried to Summary****5,374,764.00**

**ELECTRICAL INSTALLATIONS****INCOMING SERVICES****Incoming transmission cable**

A	120mm <sup>2</sup> single core AOHL 11kV bare conductor fixed to insulator (measured separately)	1	m	2,400.00	2,400.00
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**Poles**

The following 8500mm long overall pre-cast pre-

B	Intermediate type, 1No pole with No 100mm x100mm x6mm x1800mm long galvanized steel cross arm bolted on, with twisted galvanized steel brackets, and set of 3No porcelains 11kV pin insulators as in diagram.	1	No	15,000.00	15,000.00
C	Drop pole, 2No, ditto, but 1No set of 3No disc insulators including 2No 10m long x70mm <sup>2</sup> galvanized steel stay wire and stay insulator, complete with adjustable locknut, including all necessary excavations for in-situ concrete stay wire anchor, backfilling and removal of surplus as in diagram	1	No	160,000.00	160,000.00

**Drop cable**

D	70mm <sup>2</sup> single core XLPE copper conductor drawn into UPVC duct partially exposed and partially buried underground	30	m	12,000.00	360,000.00
E	100mm diameter UPVC pipe buried underground including all necessary excavation 600mm deep, backfilling with clean river sharp sand and removed surplus excavated material	30	m	14,000.00	420,000.00

**Equipment****MV Panel**

F	Approved floor mounted MV Panel with 1No 250TPN MCCB from change over switch (measured separately) containing the following outgoings 4No 100A 8-WAY TPN ELCB and 4No spares	0	No	1,250,000.00	-
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**To Collection****957,400.00**



**ELECTRICAL INSTALLATIONS (Cont'd)****Equipment (Cont'd)****Change Over**

A	400A TPN manual change over 'MEM' switch gear with mechanical interlock including 2No 400A TPN isolator switch on from generator and the other from transformer (transformer Measured separately) mounted complete on wall with all necessary accessories as manufacturer's instructions	1	No	350,000.00	350,000.00
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**Distribution Board**

B	'MEM' or 'EEC' quality or equal and approved 3-phase 100A 8ways TPN distribution board with 12No mixed capacities miniature circuit breakers	1	No	56,000.00	56,000.00
C	45A TP&N earth leakage circuit breaker (ELCB)	1	No	67,000.00	67,000.00
D	200mm widex75mm deep overall purpose made galvanized iron steel trunking divided into three compartments with cable belt crops and 3no. screwed access cover. Trunking fabricated with 16swg galvanized iron sheets all as specified and concealed in concrete or block wall including accessories, forming chases and making good	1	m	3,400.00	3,400.00

**FINAL SUB-CIRCUIT****Power and lighting installations**

The following final sub-circuit as location drawing EW01, executed in concealed PVC pipe system and single core PVC insulated copper conductors

**Lighting points**

E	5A 1-gang 1-way lightening points	9	No	582.80	5,245.20
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**To Collection****481,645.20**

**ELECTRICAL INSTALLATIONS (Cont'd)****Power and lighting installations (Cont'd)**

A	5A 2-gang 1-way lightening points	9	No	2,100.00	18,900.00
B	5A 3-gang 1-way lightening points	9	No	2,100.00	18,900.00
C	5A 1-gang 1-way lightening points	9	No	2,100.00	18,900.00
D	5A 2-gang 2-way lightening points	11	No	2,100.00	23,100.00
E	5A 3-gang 2-way lightening points	11	No	2,100.00	23,100.00
F	5A 1-gang 2-way lightening points	11	No	2,100.00	23,100.00

**Power Points**

G	13A twin switched socket outlet laid on floors	22	No	4,100.00	90,200.00
H	13A single switched socket outlet	22	No	4,100.00	90,200.00
J	15A single switched socket outlet	8	No	1,984.00	15,872.00

**Lighting fittings**

Supply and install the following MK type or equal and approved accessories Fittings

K	4x 20W fluorescent fitting complete with thorn CAT	40	No	2,207.00	88,280.00
L	1x60W NOVA range screw neck fitting complete with Thorn CAT No. MTC 1060	20	No	4,662.40	93,248.00
M	1 x 100w tungsten bulkhead fitting complete thorn cat no. OLG.	11	No	3,000.00	33,000.00
N	1x60W surface circular mounted lighting fitting complete with Thorn cat LT 56116	12	No	3,000.00	36,000.00

**Other Outlets**

P	Television socket outlet	8	No	400.00	3,200.00
Q	Computer outlet	9	No	400.00	3,600.00
R	Alarm Bell	7	No	1,674.00	11,718.00
S	Smoke detector	8	No	1,674.00	13,392.00
T	Fire alarm break glass system	9	No	2,790.00	25,110.00
U	8-zone fire alarm panel	1	No	120,000.00	120,000.00

**To Collection****749,820.00**

**ELECTRICAL INSTALLATIONS (Cont'd)**Supply and install the following accessories as before described

A	1800mm 3-blade sweep Newclime or equal and approved ceiling mounted fan complete with roses and hooks	0	No	16,000.00	-
<b><u>Builder's work</u></b>					
<u>Cut away and make good all builder's work disturbed after electrical execution complete in the following</u>					
B	Lighting and switch points and their likes	12	No	300.00	3,600.00
C	Socket outlet points and their likes	22	No	320.00	7,040.00
D	Fittings outlet points	11	No	210.00	2,310.00
E	Allow for testing and commissioning all works in this section		item		60,000.00

**To Collection Below****72,950.00****Collection**

Page 13	957,400.00
Page 14	481,645.20
Page 15	749,820.00
Page 16	72,950.00

**ELECTRICAL INSTALLATIONS**  
**Carried to Summary****2,261,815.20**

**MECHANICAL INSTALLATION****Cold Water Supply And Fire Fighting Equipment****Equipment**Supply and install the following equipment

A	'Angus' swinging or equal and approved fire hose reel, 20mm diameter, 30m long flexible discharged hose mounted for easy access on block wall complete with accessories	1	No	22,000.00	22,000.00
B	'GEEPEE' or equal and approved overhead PVC cylindrical water tank of 3000 liters capacity with and including mounting on concrete decked roof top about 7m high, complete with 3 no. gate valves, overflow pipe, cover and all other necessary accessories	1	No	65,000.00	65,000.00
C	2.5HP 'SEAR' or equal and approved quality booster pumping machine mounted in accordance to manufacturer's details one duty and one standby	1	No	61,000.00	61,000.00
D	NRV, GV and water meter reader supplied by water board authority fixed to 38mm diameter incoming pipe (measured separately)	1	No	12,000.00	12,000.00
<b><u>Pipes work</u></b>					
G	Allow for connection to main line and other statutory charges		Item		85,000.00

**To Collection****245,000.00**



**MECHANICAL INSTALLATION (Cont'd)****Pipes work (Cont'd)**

A	38mm diameter incoming galvanized iron pipes, including stop cork, union connectors and bends as detailed by the engineer, and excavate trench not exceeding 600mm wide, backfill and remove surplus material (Provisional)	30	m	800.00	24,000.00
B	Ditto stop cork	1	No	2,000.00	2,000.00
<b><u>Overhead tank supply pipes</u></b>					
C	38mm diameter UPVC cold water supply pressure pipes partly buried underground and partly fixed to block or concrete work	1	m	600.00	600.00
D	38mm diameter elbow	1	No	340.00	340.00
E	Ditto union connector	5	No	217.00	1,085.00
F	Ditto socket	5	No	198.00	990.00
G	Ditto gate valve	5	No	124.00	620.00
H	38mm diameter UPVC cold water supply pressure bypass pipes partly buried underground and partly fixed to block or concrete work	28	m	347.20	9,721.60
J	38mm diameter elbow	2	No	229.40	458.80
K	38mm Tee	4	No	173.60	694.40
L	Ditto union connector	4	No	161.20	644.80
<b><u>Overhead tank supply pipes (Cont'd)</u></b>					
M	38mm diameter socket	6	No	186.00	1,116.00
N	Ditto gate valve	7	No	124.00	868.00
P	38mm x 32mm diameter reducing tee	8	No	130.20	1,041.60
<b>To Collection</b>					<b>44,180.20</b>

**MECHANICAL INSTALLATION (Cont'd)****Foul Water Discharge (Cont'd)**

A	150x50mm diameter tee	50	No	756.40	37,820.00
B	100x100mm ditto	35	No	551.80	19,313.00
C	100x50mm tee	55	No	551.80	30,349.00
D	100mm bend	25	No	254.20	6,355.00
E	50x32mm diameter branch	33	No	217.00	7,161.00
F	32mm diameter bend	33	No	136.40	4,501.20

**To Collection****105,499.20****Collection Page**

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245,000.00

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44,180.20

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105,499.20

**MECHANICAL INSTALLATIONS**  
**Carried to Summary**

**394,679.40**

**SUMMARY**

Substructure	8,761,040.00
Frames	916,000.00
Roofing	5,270,200.00
Walls	2,028,000.00
Windows and Doors	1,985,300.00
Finishes	5,374,764.00
Electrical Installations	2,261,815.20
Mechanical Installations	394,679.40

**ANIMAL HOUSE CENTRE**  
**Carried to General Summary**

**26,991,798.60**