

BILL OF QUANTITY

MAIN BUILDING GALAFI ETHIOPIA

PRELIMINARY INFORMATION

No. Sufficiency of Tender

- A** The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and of the rates and prices used in arriving at the lump sum price(s) stated in the priced Bills of Quantities which rates and prices shall cover all his obligations under the contract and all matters and things necessary for the proper completion and maintenance of the works.

Definitions and Abbreviations

- B** Abbreviations used in these Bills of Quantities shall be interpreted as follows:

"Approved" shall mean approved by the Project Manager

"as directed" shall mean as directed by the Project Manager.

"B.S" shall mean The Current British Standard Specifications published by the British Standards Institution, 2 Park Street London, W.1, England.

"Kg" shall mean kilogramme

"No." shall mean number

"M" shall mean Linear metres

"M2" shall mean square metres

"M3" shall mean cubic metres

"Do" shall mean the whole of the preceding description except as qualified in the description in which it occurs.

(M.S) SHALL MEAN Measured Separately.

"VAT" shall mean Value Added Tax.

"Net Contract Sum" or "Net Tender Sum" shall mean the Tender / Contract Sum or adjustments thereto before the addition of Value Added Tax.

Site levels

- C** Before commencing work, the Contractor must arrange for and agree with the Project Manager the existing site levels and similarly establish and agree a bench mark.

Contractual Requirements

- D** Performance Security clause

- E** Advance payment guarantee

- F** Insurance of works covering all installations during and up to 28 days after the end of the defects liability period

- G** All contractor insurance; Third party insurance, Equipment Personnel

- H** The Contractor shall carry out conformatory topographical surveys and geotechnical investigations; Hydrological surveys for water sources and flow rates

Setting out

- A** The Contractor shall set out the Works in accordance with the dimensions and levels shown on the drawings and shall be responsible for the correctness of all dimensions and levels so set out by him and will be required to amend all errors arising from inaccurate setting out at his own cost and expense. In the event of any error or discrepancy in the dimensions or levels marked on the drawings being discovered, such errors or discrepancies must be reported by the Contractor to the Project Manager for his immediate attention.

- B** No work shall be commenced by the Contractor until he has received written instruction from the **Project Manager** to adjust such discrepancies which may be proved. Upon receipt of such instruction, the Contractor shall thereupon be responsible for adjustments necessary to comply with such instruction, and no claim for extra expense or relief from the provisions of the Conditions of Contract based on any discrepancy or error in the dimension or levels shown on the drawings may be made thereafter.

- C Before any work is commenced by sub-contractors or specialist firms, dimensions must be checked on the site and / or buildings and agreed with the Contractor, irrespective of the comparable dimensions shown on the drawings. The Contractor shall be responsible for the accuracy of such dimensions.

Materials, goods and workmanship to conform to description, testing and inspection, samples

- D I) The standard of workmanship shall not be inferior to the current **ETHIOPIAN BUILDING CODE OF STANDARDS** or where none are available the Equivalent EUROPEAN Codes of Practice. No Material for use in the permanent construction are to be used for any temporary or other purpose than that for which they are provided.

ii) The Contractor shall furnish at his own cost any samples of materials or workmanship or any tests that may be called for by the **Project Manager** for approval or rejection and for any further samples or tests in the case of rejection until they are approved by the Project Manager unless otherwise provided for herein.

iii) The Contractor shall submit detailed schedules stating order and delivery dates along with regular updates to the Project Manager, as required.

Existing property

- E The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains, other services and landscaping and he will be held responsible for all damage thereto arising from the execution of this Contract and he shall make good all such damage when directed at his own expense.

Existing services

- F Prior to the commencement of any work the Contractor is to ascertain from the relevant authorities the exact position, depth and level of all existing electric cables, water pipes or other services in the area and he shall make whatever provisions may be required by the authorities concerned for the support and protection of such services.
- G Any damage or disturbance caused to any service shall be reported immediately to the Project Manager and the relevant authority and shall be made good to their satisfaction at the Contractor's expense.

Materials, tools, plant and scaffolding

- A All materials and workmanship used in the execution of the works shall be of the best quality and description unless otherwise described. Any materials for the Works condemned by the Project Manager shall immediately be removed from the site at the Contractor's expense.
- B The Contractor shall be responsible for the provision of all materials, scaffolding, tools, plants, transport and workmen required for the Works except insofar as may be stated otherwise herein and he shall allow for the provision of the foregoing except for such items specifically and only required for the use of the Nominated Sub-Contractors as described herein.
- C No timber used for scaffolding, formwork or similar purpose shall be used afterwards in the Permanent work.
- D All such plant, tools and scaffolding shall comply with all regulations whether general or local in force throughout the period of the Contract and shall be altered or adapted during the Contract as may be necessary to comply with any amendments in or additions to such regulations.

Statutory obligations, notices, fees, charges, local regulations and Bye-laws

- E The Contractor is to comply with all local regulations and bye-laws of the Local Authority including serving of notices and paying fees.
- F The Contractor shall allow for paying and obtaining all approvals including those of Local Authorities, City Council, Occupation Permit and all other legally demandable statutory fees, rates or taxes. No adjustment of the Contract Sum will be made in respect of such payments, unless expressly stated to the contrary in these Bills of Quantities.

Supervision

- G The said works shall be executed under the direction and to the entire satisfaction of the Project Manager and the Clerk of Works, who shall have the Project Manager's specifically delegated authority, and who shall at all times have access to the works and to the yards and workshops of the Contractor or other places where work is being prepared for the building works.

Transport to and from sites

- H The Contractor shall include in his prices for the transport of materials, workmen etc. to and from the sites of the proposed works, at such hours and such routes as are permitted by the authorities.

Fair wages

- A The Contractor shall pay rates of wages and observe hours and conditions of labour not less favourable than the minimum rates or remuneration and minimum conditions of employment applicable in the district in which the work is carried out. The relevant notice must be posted up and kept posted upon the site where it can conveniently be read by the employees concerned.
- B The Contractor is to comply with the Regulation of Wages and Conditions of **Employment Act, Building and Construction Industry Wages council** and is to be responsible for compliance by Sub-contractors employed in the execution of the Contract. If required, he is to notify the Project Manager of the names and addresses of all such sub-contractors. Any Contractor or sub-contractor not so complying will not be permitted to tender for other work for such period as the Project Manager may determine.
- C Should a claim be made to the Project Manager alleging the Contractor's default in payment of Fair Wages of any workman employed on the Contract and if proof therefore satisfactory to the Project Manager is furnished by the **Labour Department**, the Project Manager may, failing payment by the contractor pay the claim out of any monies due or which may become due to the Contractor under this contract.
- D The Contractor is to furnish to the Project Manager, if called upon to do so, such particulars of the rates of wages, hours and conditions of labour referred above, as the Project Manager may direct.

Relevant Labour Laws

- E The Contractor's attention is called to the relevant labour laws in the country and the Contractor should allow in the Preliminaries of this Contract for all costs arising or resulting there from.

Security of the works and fencing

- F The Contractor shall be entirely responsible for the security of all the Works, stores, materials, plant, personnel etc. both his own and sub-contractors and shall provide all necessary watching, lighting and other precautions as necessary to ensure the security and protection of the public. The Contractor shall provide identification cards with Photographs of all workers on the site to the satisfaction of the Project Managers.

Public and private roads, pavement, etc

- G The Contractor will be required to make good at his own expenses any damage he may cause to the present approach road surfaces during the period of the Works.

Police regulations

- H The Contractor is to allow for complying with all instructions and regulations of the Police Authorities.

Area to be occupied by contractor

- A The areas of the sites which may be occupied by the Contractor for use as storage and for the purpose of erecting workshops, etc. shall be defined on the site by the Project Manager.

Progress schedule

- B Immediately after signing the Contract the Contractor is to prepare a Time and Progress Chart showing the time and order in which he proposes to carry out the Works within the total construction time stated in the Contract. The Chart shall show in detail the construction time, order in which each section of the work is to be carried out and be sub-divided into trades or tasks.

Monthly progress reports shall be prepared by the Contractor and submitted to the Project Manager in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the certificate of practical completion for the Works.

Each report shall include but not limited to:

- (a) a programme and progress chart devised in such a way that the approved contract work program is shown and progress can be marked up against it as the work proceeds,
- (b) photographs showing the status of progress on the Site,
- (c) records of the Contractor's Personnel and Equipment,
- (d) Site Weather Records duly certified by the Clerk of Works/Site Engineer
- (e) copies of quality assurance documents, test results and certificates of materials,
- (f) updated cash flow projection,
- (g) procurement schedule,
- (h) safety statistics,
- (i) comparisons of actual and planned progress, with details of any events or circumstances which may jeopardise the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome the delays.

Following receipt of such a notice, the Contractor shall take such steps as may be necessary, and as the Project Manager may approve, to remedy or mitigate the likely delay, including revision of the programme. The Contractor shall not be entitled to any additional payment for taking such steps.

- C The Contractor shall obtain the Project Manager's approval of the Chart and then shall supply copies to the employer and Project Manager, as requested.

Overtime

- A The Contractor shall be responsible for any extra costs for overtime working he considers will be necessary in order to complete the work within the contract period or time for completion apart from the overtime working which may be authorised by the Project Manager.
- B If overtime is worked in accordance with a written instruction issued by the Project Manager, the Contractor will be reimbursed in respect of such overtime to the extent only of the additional net cost of unproductive time payable over and above the basic hourly rates as laid down by the Regulation of wages and Conditions of Employment Act, Building and Construction Industry Wages Council and excluding any bonuses, profits and overheads.

Water

- C The Contractor shall allow for providing all temporary water supplies required for the works, including Sub-Contract Works, together with all necessary storage tanks and distribution systems for the same and must allow for bearing all expenses incurred and paying for all water consumed without charge to any Sub-Contractor. Expenses in connection with Nominated Sub-Contractors should be allowed for in the attendance items under the relevant **P.C. Sums**.
- D All water shall be fresh, clean and pure, free from earthy, vegetable or organic matter, acid or alkaline substance in solution or suspension.

Lighting and power

- E The Contractor shall allow for providing all temporary lighting and power supplies required for the works, including Sub-Contract works, together with all necessary distribution systems for the same and must allow for bearing all expenses incurred and paying for all current consumed without charge to any Sub-Contractor. Expenses in connection with Nominated Sub-Contractors should be allowed for in the attendance items under the relevant **P.C. Sums**.

No guarantee or warranty is given as to the availability or suitability of power at the site.

Testing

- F The Contractor shall allow for all testing of materials as required, and he shall be responsible for all expenses incurred in completing such tests, including costs of materials and labour equipment, transport and charges of the testing authority etc.

Temporary works

Access to sites and temporary roads

- G Means of access to the site shall be agreed with the Project Manager prior to commencement of the Work and
H Upon completion of the works, the Contractor shall remove such temporary roads, temporary culverts, bridges etc. and make good and reinstate all works and services distributed to the satisfaction of the Project Manager.

Temporary buildings for use by the Contractor

- B The Contractor shall at his own cost, supply and erect all temporary buildings, sheds, mess rooms and stores with floors at least 150mm above ground level. No office, stores or other temporary buildings shall be erected on Site without first obtaining the consent from the Project Manager as to the type of temporary building to be supplied and the position in which they are to be erected.

Sheds for storage of Materials

- C The Contractor shall provide and maintain on the Site, ample weather-proof sheds for storage of cement and other perishable materials and shall clear the same away on completion and make good any disturbed surfaces.

Offices for the Consultants

- D The Contractor shall provide, erect and maintain where directed on Site approved weather-proof lockup office for the sole use of the Consultants with a floor area not less than 24 square meters. The office shall be constructed with concrete or wooded floor and the walls and ceiling internally are to be lined with fiberboard. Glazed windows (with curtains or sunshades) shall be provided of not less than 1 meter square area and the door shall have a strong lock or fastening. The office shall be provided with artificial lighting and electric power. The contractor shall allow for regular cleaning of the office. The office is to be furnished with the following :

(a) 1 No. 20 Seater table, and 20 chairs.

(b) 2 No. Pin Boards with a minimum space of 2.0 square metres each

(C) 1 No. A0 Size drawing chest with four drawers

The Contractor shall maintain a display of the Programme and Progress chart in the project managers offices, devised in such a way that the lined programme is shown and progress can be marked up as the work proceeds. The Contractor shall keep this chart up to date at all times.

The Contractor shall keep on the Site and maintain in good condition, one dumpy or quickset level and leveling staff and one 30 meters steel/linen tape for the use of the Consultants. The Contractor shall also provide stationery for use by the consultants.

He shall provide, erect and maintain a lockup pedestal type water closet for the sole use of the Consultants. The office and the closet shall be completed before the Contractor is permitted to commence the Works.

Office for the Clerk of works / Site Engineer

- A The Contractor shall provide, erect and maintain where directed on site an approved weather-proof office for the sole use of the Clerk of Works. The office shall be not less than 12 square meters and shall be of construction similar to the office of the consultants. The office shall as a minimum be furnished with the following: The contractor shall allow for regular cleaning of the office.

(a) 1 No. office desk with lockable drawers, and chair with arm rest, two visitors chairs with armrest

(b) 1 No. A0 Size drawing chest with four drawers

(c) 1 No. Lockable metal filing cabinet

(d) One other office desk and two chairs with armrest

(e) 1 No. bookshelf with a minimum of 4 square metres of shelf space

- (f) 2 No. Pin Boards with a minimum space of 1.5 square metres each
- (g) Power and Lighting Points as necessary
- B The contractor shall also supply and maintain the following for the full contract duration, with and including all consumables and maintenance, to the Project Manager's approval:-
 - (a) 1No. fully connected desktop computer with UPS (Dell Optilex GX9020 desktop computers ,Intel Core i7
 - (b) 1No. Plain paper photocopier, desktop type with variable magnification that can take A3 full size copies, minimum capacity 10copies/minute, including 3kg toner and regular service by agent
 - (c) 1No. A3 colour printer
 - (d) Full time internet connection
 - (e) 1No. 20 mega pixel digital camera with minimum 30-bit colour depth and 2GB memory card as manufactured by Sony or equal approved
 - (f) A standard projector and screen.
- C On completion of the project, all equipment will become the property of the Employer.
- D Upon completion all temporary buildings are to be removed and cleared away.

Communication

- E All communications will be to the contractors offices, and the contractor shall provide effective means of communication, including voice and facsimile facilities from Administration office to site and this will be made available for the use of the project manager and his representative and the contractor will pay all costs and connection charges.

Sanitation of the works

- A The sanitation of the works shall be provided, maintained and removed on completion by the contractor to the satisfaction of the project manager and local authorities.
- B The latrines shall be enclosed with framing and corrugated roofing sheets, sides and partitions with concrete floors, steel trowelled smooth to falls to facilitate washing. Their location shall be agreed with the Project Manager and the works shall not be commenced before the sanitary accommodation has been approved by the above -mentioned authorities.
- C The Project Manager will be required to pay all conservancy charges and shall ensure clean daily maintenance and disinfecting of the latrines, and not less than once per week, the whole area shall be sprayed with disinfectant and on completion of the works the latrines and any temporary drains shall be removed and all works and surfaces disturbed made good and the whole area disinfected and left clean and free from pollution to the satisfaction of the Project Manager and local authorities.

Notice boards/ Sign boards

- D The contractor shall provide and erect where directed and maintain during the whole period of building

Temporary Hoardings, Fencing and the like

- E The Contractor shall be entirely responsible for all temporary hoarding and fencing which shall be required by either the Project Manager or the Local Authority. The Contractor should ascertain the extent of such temporary hoardings and fencing and include the costs in his bid.
- F Secure hoarding, gates and chainlink fencing shall be utilised taking into account the sectional completion of works to the project Manager's satisfaction.
- G The contractor is to obtain any necessary permits, maintain in position, pay all necessary fees and finally clear away on completion.

Protection of the works

- H The contractor shall cover up and protect all finished works liable to damage including provision of temporary roof, gutters, drains, etc. until the completion of the works.
- A In the event of any damage occurring to the works, materials, sewers, drains, gullies, paths or other works on the site in temporary possession of the contractor for the purpose of this contract, either from the weather, want of proper protection, defects, or insufficiency of works or any other cause whatsoever during the progress of the works, the contractor alone shall be responsible and shall without extra charge, make good all damage and pay all costs which may be levied.

Prevention of nuisance

- B** The works and such sections of the site necessary therefore, shall be under the entire care and control of the contractor during the whole period of the contract and he shall take all possible precautions to prevent any nuisance, inconvenience or injury to the holders or occupiers of the existing or surrounding properties and to the public generally, and shall at all times keep all paths and roads affected by the works in a safe and clear state, and shall use proper precautions to ensure the safety of all wheeled traffic and pedestrians.

Removal of plant, rubbish, etc.

- C** The contractor shall, upon completion of the works, remove and clear away all temporary buildings, plants, rubbish and unused material and shall leave the whole of the site of works in a clean and tidy state to the satisfaction of the Project Manager. He shall also remove all rubbish and dirt from the site at weekly intervals or as directed by the Project Manager.
- D** Particular care shall be taken in leaving windows clean and the removal of all paint and cement stains therefrom.

Records

- E** The contractor shall allow for keeping all records relevant to the works and shall keep on site a daily recording of weather conditions, temperature, rainfall, visitors, Plant, workforce, to the site etc.

Training and standard levies

- F** The contractor shall allow for all costs related to training and standard levies, and the like, as required by the Laws.

Engineers Accommodation and Attendance Upon Engineer and His/her site Personnel

- G** Provide Type 1 house fully furnished and Equipped for the Engineer
- H** Maintenance of housing accommodation for the Engineer's staff (2No. Unit) including provision and payment of utility services
- I** The Contractor shall allow for Cost for payment of surveyor support staff and laboratory technicians

Occupational Health and Safety, HIV/AIDS and Gender

- A** The Contract shall provide a qualified safety officer to deal with OHS, HIV/AIDS and Gender Management and provide all necessary facilities including transport. HIV/AIDS and STD prevention and counseling shall include information, education and counseling campaigns including regular distribution of condoms. The Contractor shall provide, maintain and operate a HIV/AIDS and STD clinic or make alternative arrangements with an existing facility to the approval of the Project Manager. The Contractor shall also carry out Gender sensitisation and awareness raising meetings and workshops and provide gender sensitive monitoring and reporting.

The Contractor (including his sub-contractors) or any sub-contractor directly employed by the client shall ensure that all health and safety provisions are in place and are functional prior to doing any work on site on a daily basis. Non compliance shall attract an express penalty of USD 1,000 (United state Dollar one thousand Thousand only) per day per item listed on the health and safety plan that is not implemented. Such amounts shall be deducted from payment due to main contractor in the valuation that will be issued in the period after the incidence. A letter informing the responsible contractor/sub-contractor of the said undertaking shall be issued by the consultants immediately when the noncompliance is identified.

Compliance with NEMA Regulations and the Environment Impact Assessment Report Recommendations

- B** The Contractor shall comply with all the regulations set out by the National Environmental Management Authority (NEMA). The contractor should familiarize himself with the Recommendations of the Environmental Impact Assessment and comply with them during execution of the work.

As-built drawings and operating & Maintenance Manuals

- C** "As built" drawings and/or operating and maintenance manuals shall be supplied by the Contractor by the date stated in the Conditions of Contract and Contract Data.

Copyright

- D** The Copyright of these documents is vested in the Project Manager and they may not be reproduced in whole or in part without the Project Manager's Written Permission.

Transport Vehicles

- E** Provision of Double Cabin Pick-up (2no.) transport vehicle (4WD) of 2800 cc minmun egine capacity -hand over to the employer in good condition on substantial completion of the Contract
- F** Double Cabin Pick-up transport vehicle (2No.) - running costs (144,000km)
- G** The Contractor shall allow for the techmical and political commissioning of the completed works

BILL OF QUANTITY

**MAIN BUILDING GALAFI ETHIOPIA
LOT -01**

BILL OF QUANTITY

(One-Stop Border Post main building Galafi Ethiopia)

LOT -01

ITEM	DESCRIPTION	PAGE	AMOUNT (USD)
	<u>MAIN BUILDING GALAFI ETHIOPIA LOT-01</u>		
	<u>SUMMARY</u>		
A	ELEMENT A: SUBSTRUCTURES		-
B	ELEMENT B: GROUND FLOOR		-
C	ELEMENT C: FIRST FLOOR		-
D	ELEMENT D: ROOFING		-
E	ELEMENT E: WINDOWS		-
F	ELEMENT F: DOORS		-
G	ELEMENT G: CEILING FINISHES		-
H	ELEMENT H: INTERNAL WALL FINISHES		-
I	ELEMENT I: EXTERNAL WALL FINISHES		-
J	ELEMENT J: FLOOR FINISHES		-
K	ELEMENT K: STAIRCASE FINISHES		-
L	MECHANICAL INSTALLATION		-
M	MECHANICAL RETICULATION		-
N	ELECTRICAL INSTALLATION		-
O	AIR CONDITIONING INSTALATION		-
	SUMMARY FOR MAIN BUILDING		-
	CONTIENGECY (10%)		-
	SUMMARY FOR MAIN BUILDING (INCLUDING 10% CONTIENGECY)		-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	BILL NO.2				
	MAIN BUILDING				
	ELEMENT A: SUBSTRUCTURE				
	<u>Site Clearance</u>				
A	Clear area of new construction of all undergrowth small bushes, grub up all trees and remove existing structure and any obstructions as directed.	m ²	2,896		
B	Excavate over site to remove vegetable soil 150mm deep and take away debris from site.	m ²	2,896		
C	Cut down and dig up existing tree stump average 500mm diameter grub up roots and cart away debris from site	Item	1		
	<u>Excavations</u>				
D	Excavate to reduce site levels: 0 - 1.50m deep	m ³	724		
E	Ditto: 1.50m - 3.0m deep	m ³	10		
F	Excavate pit for Column bases: ditto	m ³	920		
G	Excavate trench for strip foundations: 0 - 1.50m deep from reduced levels	m ³	321		
H	Extra over general excavation for excavation in rock and removal of materials from site	m ³	197.50		
	<u>Imported murrum compacted to 95% MDD AASHTO, in layers not exceeding 150mm Thick: as directed by the Structural engineer</u>				
I	Backfilling around foundations Filling to make up levels	m ³	854		
J	Filling to make up levels	m ³	476		
K	<u>Cart away</u> Carting away surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m ³	1,965		
	Total Carried to Collection (SUBSTRUCTURE)				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
A	Allow for keeping the whole of the excavations free from mud, silt and water by bailing, pumping or otherwise	Item	1		
B	Planking and strutting to sides of excavations Allow for the provision, maintaining and subsequent removal of all required planking and strutting to uphold sides of all excavations and for keeping same free from fallen materials	Item	1		
C	Approved hard-core filling as described 200mm Thick hardcore bed well compacted, levelled and blinded with stone dust: under floor	m ²	2,457		
	<u>Termidor 25 EC' or other equal approved anti-termite chemical treatment: applied by an approved professional pest control specialist: strictly in accordance with the manufacturer's instructions to</u>				
D	Sides and bottoms of column bases	m ²	2,244		
E	Ditto: of strip foundations	m ²	944		
F	Surfaces of Hardcore bed	m ²	2,457		
	<u>Solid Blockwork in cement mortar (1:4) Reinforced with 25 X 3 mm hick hoop iron strips at alternative courses to:</u>				
G	200mm Thick plinth walling	m ²	254		
	<u>Hessian based bituminous felt or other approved damp-proof course laid on and including 25mm cement and sand (1:3) mortar as described under:-</u>				
H	200mm wall	m	1,263		
I	Damp proof membrane Single layer of 1000gauge polythene water-proof membrane laid on blinded hardcore with 225mm laps at all joints (measured nett)	m ²	2,457		
	<u>Plain in-situ concrete (Class 15 / 20mm aggregates as described in:-</u>				
J	50mm Thick horizontal blinding:	m ³	30.65		
	Total Carried to Collection (SUBSTRUCTURE)				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	<u>Plain in-situ concrete (Class 20 / 20mm aggregates as described in:-</u>				
A	400mm Concrete strip wall foundations	m ³	96.00		
	<u>Vibrated Reinforced concrete (Class 30 / 20mm aggregates as described in:-</u>				
B	Column Bases	m ³	306.00		
C	Stair case footing	m ³	10.00		
D	Column Stubs	m ³	47.00		
E	Ground Beams	m ³	96.00		
F	200mm site slab	m ²	2457.00		
	<u>High yield twisted bars reinforcement to BS 4461</u>				
G	8mm Diameter bar.	kg	1670.00		
H	16mm Ditto.	kg	23864.00		
	<u>Welded fabric mesh reinforcement to BS 4483</u>				
I	Mesh reinforcement ref.A142 weighing 2.22kg/m2: in floor slab with 200mm side and end laps (measured nett)	m ²	4914.00		
	<u>Sawn formwork as described to:-</u>				
J	Vertical sides: of Column stubs	m ²	336.00		
K	Vertical sides: of Column bases	m ²	447.00		
L	Vertical sides: of Ground Beam	m ²	1036.00		
M	Edge of Ground floor bed: 150-200mm high	m	263.00		
	<u>Plinth finishes</u>				
N	15mm thick cement and sand (1:4) rendering to plinths externally.	m ²	129.00		
O	Prepare and apply three coats of bitumastic or equal approved water resistant paint rendered plinths externally.	m ²	129.00		
	Total Carried to Collection (SUBSTRUCTURE)				-
	TOTAL BILL NO.2 (SUBSTRUCTURE) CARRIED TO MAIN SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT B: GROUND FLOOR WALLING AND FRAME STRUCTURAL STEELWORK OF GRADE S275 Framed structural steelwork to structural details: bolt connections: one coat red oxide primer before erection				
A	203x203x46 UC stanchion	t	21.16		
B	356x127x39 UB Beam	t	42.51		
C	203 x 152 x 23 UB Beam	t	8.86		
	Sundries D 350x250x20mm thick plate with 4no.30mm diameter holes to 25mm dia bolts (MS) E 450x200x20mm thick plate with 8no.22mm diameter holes to 20mm dia bolts (MS) F 10mm Stiffener plater 200mm high G 25mm diameter hold down bolts with nuts and flat round washers 350mm long H 20mm diameter hold down bolts with nuts and flat round washers 350mm long I 25mm diameter Grade 8.8 bolts with Nuts washers J 20mm diameter Grade 8.8 bolts with Nuts washers	No No No No No No No	236 262 236 472 2,096 472 4,192		
	<u>Vibrated concrete (Class 30/ 20mm aggregate) of as described in:-</u> K 200mm thick Composite slab with 1.2mm thick ComFlor100 steel deck; including 19mm dia, 100mm high headed shear stud connector grade S450 spaced @230mm centre to centre	m ²	850		
	L 150mm thick Composite slab with 1.2mm thick ComFlor80 steel deck, including 19mm dia, 100mm high headed shear stud connector grade S450 spaced @230mm centre to centre	m ²	1,443		
	Total Carried to Collection-1 (WALL & FRAME)				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
A	Prepare, supply and apply awater proofing membrane and sika Cemflex liquid to; Floor Slab	m ²	2,293		
B	Supply and apply Sikaflex PRO 2HP 600ml Sealant at Jointing between slab and wall	m	2,180		
C	<u>Precast Concrete (Class 25/ 20mm aggregate) of as described:</u> Lintel size 200mm x 250mm High: with and including 4No 12mm diameter mild steel bars and 6mm mild steel links at 200mm centres including hoisting and bedding in position in cement:sand mortar (1:3)	m	158		
D	<u>Sawn formwork: to</u> Horizontal soffites of suspended slabs	m ²	2,293		
E	Horizontal edges of suspended slab: 150 -225mm high	m	363		
F	<u>Solid Concrete Block work in cement mortar (1:4)</u> <u>Reinforced with 25 X 3 mm hick hoop iron strips at alternative courses to: -</u> 200mm Thick walling: Internally	m ²	1,252		
G	200mm Thick walling: Externally	m ²	1,482		
H	100mm Thick walling: Internally	m ²	392		
	Total Carried to Collection-2 (WALL & FRAME)				-
	STAIRCASES <u>Structural steelwork to structural details: bolted and welded connections:</u>				
A	10mm thick checkered plate landing	t	1.23		
B	254 x 76x CH Stringer beam	t	0.92		
C	300mm wide Treads in 10mm thick checkered steel plate	t	5.44		
	Sundries				
D	800x200x20mm thick plate with 8no.22mm diameter holes to 20mm dia bolts (MS)	No	6		
E	20mm diameter hold down bolts with nuts and flat round washers 350mm long	No	48		
F	20mm diameter Grade 8.8 bolts with Nuts washers	No	48		
	TOTAL (STAIRCASES) CARRIED TO SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	RAMP STRUCTURAL STEELWORK GRADE S275 <u>Framed structural steelwork to structural details: bolt connections: one coat red oxide primer before erection</u>				
A	305x127x37 UB Beam	t	3.94		
B	203 x 133 x 40 UB Beam	t	2.65		
	Sundries				
C	450x200x20mm thick plate with 8no.22mm diameter holes to 20mm dia bolts (MS)	No	48		
D	10mm Stiffener plate 200mm high	No	48		
E	20mm diameter hold down bolts with nuts and flat round washers 350mm long	No	384		
F	25mm diameter Grade 8.8 bolts with Nuts washers	No	384		
	<u>Vibrated concrete (Class 30/ 20mm aggregate) of as described in:-</u>				
G	200mm thick Composite slab with 1.2mm thick ComFlor100 steel deck; including 19mm dia, 100mm high headed shear stud connector grade S450 spaced @230mm centre to centre	m ²	75		
	<u>Welded fabric mesh reinforcement to BS 4483</u>				
H	Mesh reinforcement ref.A142 weighing 2.22kg/m ² : in floor slab with 200mm side and end laps (measured nett)	m ²	150		
I	<u>Sawn formwork to:</u> Sloping soffits	m ²	45		
J	Horizontal soffits of landings	m ²	10		
K	Edges of landing: 150-225mm high	m	60		
	TOTAL (RAMP) CARRIED TO SUMMARY				-
	TOTAL ELEMENT B GROUND FLOOR CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT C: FIRST FLOOR <u>WALLING AND FRAME STRUCTURAL STEELWORK OF GRADE S275</u> <u>Framed structural steelwork to structural details: bolt connections: one coat red oxide primer before erection</u>				
A	203x203x46 UC stanchion	t	21		
B	152 x 152 x 23 UB Beam	t	26		
	Sundries				
D	250x200x20mm thick plate with 8no.22mm diameter holes to 20mm dia bolts (MS)	No	262		
F	20mm diameter hold down bolts with nuts and flat round washers 350mm long	No	2096		
G	20mm diameter Grade 8.8 bolts with Nuts washers	No	4192		
	<u>Precast Concrete (Class 25/ 20mm aggregate) of as described:</u>				
F	Lintel size 200mm x 250mm High: with and including 4No 12mm diameter mild steel bars and 6mm mild steel links at 200mm centres including hoisting and bedding in position in cement:sand mortar (1:3)	m	158		
	<u>Solid Concrete Block work in cement mortar (1:4)</u> <u>Reinforced with 25 X 3 mm hick hoop iron strips at alternative courses to: -</u>				
G	200mm Thick walling: Internally	m ²	933		
H	200mm Thick walling: Externally	m ²	1,504		
I	100mm Thick walling: Internally	m ²	210		
TOTAL ELEMENT C FIRST FLOOR CARRIED TO BILL SUMMARY					-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT D				
	<u>ROOF CONSTRUCTION AND COVERING STRUCTURAL STEELWORK</u> <u>Framed structural steelwork to structural details: bolted and welded connections: one coat red oxide primer before</u>				
A	50x 50 x 3mm SHS rafters	t	2.33		
B	50x 50 x 3mm SHS Bottom Chord	t	2.88		
C	40 x 40x 3mm SHS Struts & ties	t	3.00		
D	ZP80 Purlins	m	1,787		
	<u>Sundries</u>				
E	Provide for all anti rods, cleats, gusset plates, welding and all accessories	Item	1		
F	350 x 350 x 20mm Base plate fixed to beam with 4No. 22mm diameter for 20mm dia bolts.	No	114		
G	20mm diameter hold down bolts with nuts and flat round washers 350mm long	No	472		
H	20mm diameter Grade 8.8 bolts with Nuts washers	No	472		
	<u>Painting to Steel Surfaces</u>				
I	Priming and applying two undercoats and one finishing coat of gloss oil painting to the surfaces of steel members	t	11.21		
	<u>Roof covering</u> 24 Gauge pre-painted galvanized IT4 sheet of approved colour, profile and and fixing accessories as (including filler blocks for bat proofing) fixed to steel Z purlins with self Tapping screws in accordance with the manufacturers instructions.				
J	Roof covering	m ²	2,953		
K	Ditto, but 8mm double glazed laminated clear glass fixed to specialist detail	m ²	379		
L	Steel flashing 450mm girth; twice bent, 24 gauge pre-painted	m	110		
M	Standard 24 gauge ridge caping dressed over IT4 Sheets.	m	90		
	<u>Roof insulation</u> <u>Thermal insulation to the underside of the roof covering; supporting on sag rods and stretching wire;</u>				
M	Polynum` (alububble) or an equal and approved insulation material fitted in accordance with the manufacturers printed instructions	m ²	2,953		
	Total Carried to Collection (ROOF)				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	<u>Vibrated concrete (Class 30/ 20mm aggregate) of assumed mix 1:1:2/20mm diameter as described in:-</u> 150mm thick Composite slab with 1.2mm thick ComFlor80 steel deck, including 19mm dia, 100mm high headed shear stud connector grade A S450 spaced @230mm centre to centre	m ²	95		
	Prepare, supply and apply awater proofing membrane and sika Cemflex liquid to;				
B	Floor Slab	m ²	95		
C	Supply and apply Sikaflex PRO 2HP 600ml Sealant at Jointing between slab and wall	m	43		
	<u>RAINWATER DISPOSAL</u> <u>Steel rainwater gutter complete with and including all necessary fixing accessories fixed strictly in accordance with the manufacturer's instructions:-</u> D 1300mm girth x 3mm thick MS plate Pre-galvanised gutter; one end fixed to to form fascia board primed on both sides and painted on the outside surface in three coats gloss oil paint to approval	m	110		
E	Extra over for nozzle outlets.	No	8		
F	Extra over for stopped ends.	No	16		
G	200mm Diameter PVC PN10 down pipe complete with and including all necessary fixing accessories fixed with approved holder bats.	m	80		
H	Extra over for shoes.	No	8		
I	Extra over for bends.	No	16		
	<u>CLADDING</u> J Supplying and installing 0.9mm thick Aluminum Arrowhead interlocking cassette planking panels in approved cladding panels; sealing strips; secured to galvanised metal frame 40 x 40 x3mm SHS; securing frame to steel structure; including all accessories and fixtures; all as described in drawings	m ²	95		
	Total Carried to Collection (ROOF)				-
	TOTAL ELEMENT D (ROOF CONSTRUCTION AND COVERING) CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT E				
	WINDOWS Precast Concrete (Class 25/ 20mm aggregate) of as described:				
A	Cill size 300mm x 65mm (average) Weathered and throated, bedded and jointed in cement mortar (1:3) and finished fair on exposed faces	m	260		
	<u>STEEL CASEMENT WINDOWS</u> <u>PURPOSE MADE WINDOWS: in steel standard section framing complete with window stay, hang, steel louvres and all other accessories; as per Archtect drawings'</u>				
B	Window (W1) Size 4500 x 1500mm high	No	7		
C	Window (W2) Size 500 x 1500mm high	No	220		
D	Window (W3) Size 1000 x 900mm high	No	14		
E	Window (W4) Size 500 x 900mm high	No	21		
F	Window (W5) Size 400 x 400mm high	No	204		
	PURPOSE MADE STANDARD Steel burglar proofing made from 20 x 20 x 2mm SHS and 40 x 3mm flats : one coat red oxide primer as per Architect's detailed drawing				
H	Window (W1) Size 4500 x 1500mm high	No	7		
I	Window (W2) Size 500 x 1500mm high	No	220		
J	Window (W3) Size 1000 x 900mm high	No	14		
K	Window (W4) Size 500 x 900mm high	No	21		
L	Window (W5) Size 400 x 400mm high	No	204		
	Prepare surface and apply Etching Primer; apply one coat primer, one undercoat and two Gloss finishing coats; on metal work : to				
M	Burglar proofing	m ²	534		
	TOTAL ELEMENT E (WINDOWS) CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT F: DOORS				
	STEEL CASEMENT DOORS Purpose made door : 50mm Thick Standard Steel door complete with and including all Iron-mongery and accessories; one coat red oxide primer; all to Architect's detailed drawing.				
A	Door D1 overall size 1500 x 2400mm high comprising of: 2mm thick mild steel plate	No	18		
C	Ditto but size 900 x 2400mm. Type D2	No	80		
D	Door size 1200x2100mm high to strong room as per architect`s details	No	2		
	TIMBER DOOR to fit frame (m.s); to Architect's details 45mm thick mahogany veneered solid core flush door: to Architect's approval; all to Architect's detailed drawing.				
E	Door, size 800 x 2100mm high; Door Type D3	No	39		
F	Ditto Size 1000x2100mm high; Door Type D4	No	8		
	Approved Wrot Joinery HARDWOOD				
G	40mm x 200mm Frame: two labours: plugged	m	240		
H	50mm x 25mm Architrave: moulded	m	480		
I	15mm x 15mm Quadrant: ditto	m	480		
	Frame treatment				
	Prime back of frame before fixing: 200-300mm girth	m	240		
	Prime back of frame before fixing: 50-100mm girth	m	960		
	"UNION" or similar and approved ironmongery to timber complete with matching screws 100 x 88 heavy duty action steel hinges hinges finished in stainless steel	Prs	71.0		
	Total Carried to Collection (DOORS)				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
A	Three lever mortice lockset complete with furniture	No	5		
B	Two lever mortice lockset complete with fixing accessories	No	47		
C	25mm rubber door stop fixed to floor;	No	163		
	Painting Prepare and apply three Coats polyurethane clear varnishin accordance with manufacturer's instructions : on wood: to				
D	General surfaces	m ²	165		
	5mm Thick Clear sheet glass and glazing as described: to				
E	Metal casement in panes 0.1 to 0.5 square meters	m ²	45		
	Prepare surface and apply Etching Primer; apply one coat primer, one undercoat and two Gloss finishing coats; on metal work : to				
F	Steel door surfaces	m ²	475		
G	Surfaces 200 - 300mm girth	m	50		
	Total Carried to Collection (DOORS)				-
	TOTAL ELEMENT F (DOORS) CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT G CEILING FINISHES				
A	Acoustic gypsum ceiling: in 400 x 400 x 12mm thick fixed with approved screws nails; nail heads punched and puttied; secure to and including metal track frame work; butt joints, set to pattern including associated cornices	m ²	3,829		
	15mm thick cement sand washed plaster in ratio 1:3 smooth finish to:				
B	Horizontal soffites: of suspended slabs and beams	m ²	50		
	Prepare and apply one coat alkali resistant primer and two finishing coats of first grade "MATT EMULSION" ceiling paint to:				
C	Plastered horizontal soffites: of suspended slabs and beams	m ²	3,829		
	TOTAL ELEMENT G (CEILING FINISHES) CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT H				
	INTERNAL WALL FINISHES				
	<u>15mm thick cement sand washed plaster in ratio 1:3 smooth finish to;</u>				
A	Vertical sides: of walls	m ²	8,560		
B	Door and windows reveals: 200-300mm wide	m	928		
	<u>Prepare and apply one coat alkali resistant primer and two finishing coats of first grade "SILK VINYL" paint on prepared surfaces to;</u>				
C	Vertical sides: of walls	m ²	8,560		
D	Door and windows reveals: 200-300mm wide	m	928		
	<u>Wall Tiles</u>				
E	25mm Thick cement: sand (1:3) backing: to receive tiles (m.s)	m ²	972		
F	200 x 300 x 6mm Thick Roller printing CERAMIC wall tiling series code 3-G 450000: bedded and jointed in approved adhesive: pointed with approved grout	m ²	684		
G	Cavity wall fixing Supply and fix plaster board to the internal surfaces of external walls	m ²	2,986		
	TOTAL ELEMENT H (INTERNAL WALL FINISHES) CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USHS)
	ELEMENT I EXTERNAL WALL FINISHES 25mm Thick cement sand (1:4) render; wood floated to:				
A	Vertical sides: of walls and columns	m ²	2,986		
	<u>Prepare and apply in accordance with manufacturers' instructions; mamoran/texture paint from equal and approved source; approved colour as render to</u>				
B	Vertical sides: of walls and columns	m ²	2,986		
	WATER PROOFING "Sika Cemflex" flexible cementitious water proofing slurry including fabric or equal approved water proofing; applied in accordance with manufactures printed specifications; to				
C	External surfaces of retaining walls	m ²	150		
	TOTAL ELEMENT I (EXTERNAL WALL FINISHES) CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT J				
	FLOOR FINISHES				
A	Cement and sand (1:4) Screed 40mm Thick floor screed to receive porcelain tiles;	m ²	3,123		
B	100 x 10mm skirting	m	2,140		
	Floor Tiles				
C	500 x 500 x 7mm Thick brown Non slip porcelain tiles: fixed with adhesive to backing (m.s) and flush pointed with matching waterproof grout (dry areas)	m ²	2,843		
D	300 x 300 x 5mm Thick unglazed non-slip ceramic tiles: ditto (wet areas) fixed with approved adhesive on screeds jointed in non absorbent grey grouting or similar approved	m ²	280		
	Skirting				
E	150mm High x 7mm Thick porcelain tiles Skirting: fixed with adhesive to backing (m.s) and flush pointed with matching waterproof grout (dry areas)	m	2,140		
	POLISHED TERRAZZO : FIRST COAT OF 25MM THICK WATER PROOF CEMENT AND SAND (1:3) SCREED, second coat of 25mm thick coloured cement and approved marble aggregate (1:2:5) including 25 x 3mm pvc dividing strips at 1200mm centres : in				
F	50mm Thick paving to Floors	m ²	1,698		
G	100 x 10mm skirting	m	398		
	TOTAL ELEMENT J (FLOOR FINISHES) CARRIED TO BILL SUMMARY				-

ITEM	DESCRIPTION	UNIT	QTY	RATE (USD)	AMOUNT (USD)
	ELEMENT K STAIRCASE AND RAMP FINISHES Prepare and apply one coat rust resistant primer and two finishing coats gloss oil paint on prepared surfaces to:				
A	Horizontal soffits	m ²	13		
B	Sloping soffits	m ²	140		
C	Stringers	m	30		
D	300mm wide Treads	m	105		
E	163.3mm high Risers	m	115		
F	150mm high Skirting	m	80		
	Balustrading				
G	900mm High mild steel balustrade; to Architect's details	m	84		
H	Ditto raking balustrade ditto	m	27		
I	Ditto raking balustrade curved on plan ditto	m	2		
J	50mm Diameter handrail welded to and including 12mm J-shaped bar 300mm girth welded to 6mm thick x 63mm x 63mm mild steel plate on stringer beam	m	84		
K	Ditto but on rake	m	27		
L	Prepare and apply three finishing coats of gloss oil paint on steel surfaces	m ²	151		
	TOTAL ELEMENT K (STAIRCASE & RAMP FINISHES) CARRIED TO BILL SUMMARY				-

Item	Description	Unit	Quantity	Rate (USD)	Amount (USD)
	MECHANICAL INSTALLATION <u>Provide all materials, install, connect and set to work the following all as described in the Specifications and Drawings.</u> Level 1: Ground Floor Fire Fighting Installations				
A	Carbon Dioxide portable fire extinguisher to BSEN3 with internal CO2 Cartridge, 9 kg as Angus or equal approved.	No.	4		
B	Dry powder portable fire extinguisher 9 kg as Angus or equal approved.	No.	4		
C	Supply, fix, test and comission the following including all materials and jointing to supply pipes, supports etc. Skid mounted electric automatic hose pump standby and duty to BS 5306: part 1:2006 section 4 (Hosereels) code of practice for fire extinguishing installations and equipment on premises c/w all accessories. Delivery rate: 30 l/s Pump head: 40 m rating: 15Kw 3 Phase 50Hz	Motor set	1		
D	Supply and install 25mm ND 30m length recessed automatic swinging type hose reel manufactured to BS EN 671-1:1995 with bottom entry and normally hang to the left of the Hinge but can swing through 180 degrees to hang to the right. The hose reel shall be c/w glass filled the right. The hose reel shall be c/w glass filled nylon jet/spray nozzle and hose clips, instruction plate, gate valve, hose reel tubing braided to BS EN 694:2001 BS EN1947:2002 and rag bolts	No.	3		
	Supply and install the following galvanised steel tubing to BS 1387 Class B c/w hangers and supports				
E	75mm GS Class C pipe from water tank to hose reels complete with all accessories.	m	408		
F	75x75x50mm Tee	No.	10		
H	50mm Tee	No.	6		
I	50mm diameter bend	No.	12		
	TOTAL CARRIED TO COLLECTION-1				-

Item	Description	Unit	Quantity	Rate (USD)	Amount (USD)
A	25mm gate valves	No.	3		
B	25mm Diameter bend	No.	18		
C	25mm GS pipe work from main riser to water hoses complete with all fittings and accessories.	m	180		
D	25mm diameter approved high pressure screw- down full-way non-rising steel wedge gate valve to BS 1952 with wheel head and joints to steel tubing	m	36		
	Ditto but 50mm diameter	m	18		
	Line pressure gauge for each hose reel	No	6		
	50mm diameter non-return valves	No	2		
	50mm diameter unoinis	No	3		
	Allow for setting to work, testing and comissioning of the entire hose reel system for the building	item	1		
	Sanitary Fittings Back to wall Vitreous China WC pan with P outlet for surface flush valve complete with seat and cover and all accessories, as Armitage Shanks Cameo btw or equal aproved. Vanity type under countertop Vitreous China Wash Hand Basin, with one tap hole 12mm chrome plated tap, 38mm chrome plated chain waste, plastic bottle trap, complete with all fittings and accessories as Armitage Shanks Marlow 480mm or equal aproved.	No. No.	16 16		
	TOTAL CARRIED TO COLLECTION-2				-

Item	Description	Unit	Quantity	Rate (USD)	Amount (USD)
A	Vitreous China Urinal Bowl complete with 38mm chrome plated waste, for flush valve fittings complete with all accessories including flush pipes, as Armitage Shanks Contour or equal aproved.	No.	3		
B	Vitreous China Urinal Bowl separator complete with all accessories, as Armitage Shanks or equal aproved.	No.	4		
C	PWD toilet suit including back to wall WC, WITH Vitreous china 6 litre flushing cistern, wash basin, with lever action tap, plastic bopttle trap, 600mm grab rails450mm grab rail for back of door, back rest rail, hinged support rail, semirecessed toilet roll holder and all accessories as Armitage Shanks doc m standard pack or equal approved.	No.	2		
	Internal Plumbing <u>All pipe work shall be PPR and shall be complete with fittings such as bends elbows, tees and all accessories and shall be inclusive of all builder's work.</u>				
D	50mm PPR PN16 cold water Pipe work complete	m	100		
E	32mm PPR PN16 cold water Pipe work complete	m	100		
F	25mm PPR PN16 cold water Pipe work complete	m	100		
G	20mm PPR PN16 cold water Pipe work complete	m	100		
H	32mm gate valves	No.	5		
I	25mm gate valves	No.	5		
J	20mm gate valves	No.	5		
K	13mm stainless steel braided tubing 300mm long including unions and jointing to PPR pipes.	No.	20		
	TOTAL CARRIED TO COLLECTION-3				-

Item	Description	Unit	Quantity	Rate (USD)	Amount (USD)
	<u>Foul Water</u> Supply and fix the following in PVC soil and waste system to BS 4514 with fittings, fixed according to the manufacturer's printed instructions and BS 5572:1978 all as supplied by KEY-TERRAIN or equal, complete with all fittings and accessories.				
A	110mm heavy duty PVC soil waste pipe on wall and or in duct.	m	150		
B	50mm PVC soil waste pipe on wall, in wall and or in duct.	m	50		
C	38mm PVC soil waste pipe on wall, in wall and or in duct.	m	24		
D	KEY-TERRAIN Floor traps	No.	6		
	TOTAL CARRIED TO COLLECTION-4				
	Mechanical Installation First Floor Installations Level 2: Fire Fighting				
A	Carbon Dioxide portable fire extinguisher to BSEN3 with internal CO2 Cartride, 9 kg as Angus or equal approved	No.	4		
B	Dry powder portable fire extinguisher 9 kg as Angus or equal approved.	No.	4		
C	Supply and install 25mm ND 30m length recessed automatic swinging type hose reel manufactured to BS EN 671-1:1995 with bottom entry and normally hang to the left of the Hinge but can swing through 180 degrees to hang to the right. The hose reel shall be c/w glass filled nylon jet/spray nozzle and hose clips, instruction plate, gate valve, hose reel tubing braided to BS EN 694:2001 BS EN1947:2002 and rag bolts	No.	3		
	Supply and install the following galvanised steel tubing to BS 1387 Class B c/w hangers and supports				
D	75mm GS Class C pipe from reservoir water tank to hose reels complete with all accessories.	m	250		
E	75x75x50mm Tee	No.	15		
F	25mm gate valves	No.	4		
	<u>Sanitary Fittings</u>				
G	Back to wall Vitreous China WC pan with P outlet for surface flush valve complete with seat and cover and all accessories, as Armitage Shanks Cameo btw or equal aproved.	No.	10		
	TOTAL CARRIED TO COLLECTION-4				-

Item	Description	Unit	Quantity	Rate (USD)	Amount (USD)
A	Vanity type under countertop Vitreous China Wash Hand Basin, with one tap hole 12mm chrome plated tap, 38mm chrome plated chain waste, plastic bottle trap, complete with all fittings and accessories as Armitage Shanks Marlow 480mm or equal approved.	No.	8		
B	Vitreous China Urinal Bowl complete with 38mm chrome plated waste, for flush valve fittings complete with all accessories including flush pipes, as Armitage Shanks Contour or equal approved.	No.	3		
C	Vitreous China Urinal Bowl separator complete with all accessories, as Armitage Shanks or equal approved.	No.	4		
E	PWD toilet suit including back to wall WC, WITH Vitreous china 6 litre flushing cistern, wash basin, with lever action tap, plastic bottle trap, 600mm grab rails 450mm grab rail for back of door, back rest rail, hinged support rail, semirecessed toilet roll holder and all accessories as Armitage Shanks doc m standard pack or equal approved.	No.	2		
Internal Plumbing <u>All pipe work shall be PPR and shall be complete with fittings such as bends elbows, tees and all accessories and shall be inclusive of all builder's work.</u>					
F	50mm PPR PN16 cold water Pipe work complete	m	50		
G	32mm PPR PN16 cold water Pipe work complete	m	50		
H	25mm PPR PN16 cold water Pipe work complete	m	50		
I	20mm PPR PN16 cold water Pipe work complete	m	50		
J	32mm gate valves	No.	4		
K	25mm gate valves	No.	4		
L	20mm gate valves	No.	4		
TOTAL CARRIED TO COLLECTION-5					-

Item	Description	Unit	Quantity	Rate (USD)	Amount (USD)
A	13mm stainless steel braided tubing 300mm long including unions and jointing to PPR pipes.	No.	10		
	Foul Water				
	Supply and fix the following in PVC soil and waste system to BS 4514 with fittings, fixed according to the manufacturer's printed instructions and BS 5572:1978 all as supplied by KEY-TERRAIN or equal, complete with all fittings and accessories.				
B	110mm heavy duty PVC soil waste pipe on wall and or in duct.	m	150		
C	50mm PVC soil waste pipe on wall, in wall and or in duct.	m	20		
D	38mm PVC soil waste pipe on wall, in wall and or in duct.	m	20		
E	KEY-TERRAIN Floor traps	No	3		
	TOTAL CARRIED TO COLLECTION-6				-
	TOTAL MECHANICAL INSTALLATION CARRIED TO MAIN SUMMARY				-

Item	Description	Unit	Qty	Rate (USD)	Amount (USD)
	BILL NO. 05 BILL SUMMARY MECHANICAL RETICULATION ELEMENT NO. 1 Sectional Glass Reinforcement Plastic Water tank Supply and Install a 350m ³ cold pressed steel sectional tank with external flanges and pitched cover with 1m wide access man way, ball float valve, bellmouth overflow fitted to a vertical standpipe, strainer, water level indicator (scale in cubic metres) and plates with internal pipe work and fittings, access points, ventilators (2No.), handrailing, and internal and external access ladders complete as detailed in the drawings and supply specifications inclusive of riser / inlet flanged pipework, outlet / distribution flanged pipework, overflow / washout flanged pipework, drainage pipework to drainage manhole and outfall structure; include excavation, backfilling, pipe bedding, duckfoot bends, valves, couplings, bends, flange adaptors, flap valve, thrust blocks, and all necessary fittings to complete installation;	NO	1		
	TOTAL CARRIED TO COLLECTION				-
A	Gate Valves 32mm(1 1/2")	No	4		
B	Valve Chamber built in concrete surround with medium duty manhole cover 600 x 600 x 300 deep	No	6		
C	Steel Tank Tower Allow a cost sum to design, fabrication and installation 12m Steel Tower for mounting above 350m ³ tank to Structural Engineers' detail, complete with safety caged cat ladder, 600mm walkway all around, 1.5m high guard rails, 3.0m demountable ladder and all accessories. The cost includes; excavation for foundation, mixing and placing reinforced concrete class 30 for foundation, footing erection of 15m high steel tower and placing of a 350m ³ as specified in drawings and specifications to the Engineer's satisfaction;	ITEM	1		
	TOTAL CARRIED TO SUMMARY				-
	MECHANICAL RETICULATION ELEMENT NO. 2 FOUL EXTERNAL DRAINAGE SYSTEM- PIPES AND FITTINGS The Contractor is to supply ,install and commission to the satisfaction of the Engineer the followingincluding builders works Manhole as 600 x 450mm (internally) inspection chambers 600mm deep invert consisting of 150mm thick concrete block wall, benched and channeled in concrete Class "Q" and rendered and trowelled smooth in 20mm thick water proofed cement/sand screed including excavation and medium duty approved cast iron cover and frame Gully trap 300 x300 complete with Gulley piece concrete surround and grating and 300 x 300 cast iron cover Septic tank size 8250mm x 2750mm x 2100mm high as per architectural detail drawing	NO	6		
B		No	30		
C		No	2		
	TOTAL CARRIED TO SUMMARY				-

Item	Description	Unit	Qty	Rate (USD)	Amount (USD)
	Infiltration trenches with hard core and covered with 1000 guage polythene and top made good to match surroundings				
A	Size 23000mm x 1000 x 1500mm high	No	2		
B	150mm Black Seamless Steel SCH40 pipe complete with all accessories.	m	30		
C	150mm globe valve	No	2		
D	Hydraulic fire alarm siren with drain point installed to run when the fire pumps are operating, and when testing complete with a MOD-BUS interface.	No	1		
E	Multistage centrifugal electric Fire pump set 60m3/hr at 65m Head, 3 phase 415V, 2900 rpm electric pump together with diesel pump 60m3/hr head 65m, 2900 rpm, on duty/standby, jockey pump 1KW to maintain pressure at 6.0bars, complete with 300litre pressure tank and control panel with 200litre diesel tank and all components to satisfy UL and NFPA requirements as supplied and assembled by NAFFCO, or equal	No	4		
	TOTAL CARRIED TO SUMMARY				-
	TOTAL MECHANICAL RETICULATION CARRIED TO MAIN SUMMARY				-

**PROPOSED TRADE AND TRANSPORT FACILITATION STUDY ON THE KAMPALA-JUBA-ADDIS ABABA-DJIBOUTI
CORRIDOR PROJECT FOR GALAFI ETHIOPIA
ELECTRICAL BUILDING RETICULATION BILL OF QUANTITIES**

Item	Description	UNIT	QUANTITY	RATE(\$)	AMOUNT(\$)
	BILL NO. 13				
	ALL SPECIFIED MATERIALS AND GENERAL NOTES				
a)	To be supplied,delivered to site, installed, connected complete and commisioned in full working condition including all the necessary fixing/mounting/terminating accessories as per specifications and drawings, tested and commisioned to the satisfaction of the Electrical Engineer				
b)	All Main/Sub-main Distrubtion pannel MCCB boards as well as MCD Distrubtion Boards to be of schneider manufacture or equal approved.				
c)	All power suppply cables measured under this bill of quantity have provisonal route length stated. Actual measurements will be done on site during evaluation				
d)	All under ground reticulation and distribution cables are to be supplied and installed c/w all necessary fixing/clipping/supporting/glanding and termination accessories as per general specification and type approved by the Engineer				
e)	The rate for the under ground cables shall cover excavation, sand bedding, back filling, trenching, enclosing in PVC ducts, man holes where necessary, and all associated builders' works. Actual measurements shall be based on the site conditions.				
f)	All indoor cables are to be recessed within the cable ducts, ceiling voids, wall fabric enclosed in suitably sized PVC conduits neatly installed as per drawings and to approval by the Engineer.				
g)	All lighting fitings shall be as per the specifications and drawings with electronic control gear compatible with 240V / 50Hz. All lighting fitings are to be approved by the Engineer prior to intsallation				
h)	All Fire Detection and Alarm System elements shall be as per specifcatons and drawings				
i)	All wiring accessories shall be as per Specifications and Drawings (or otherwise specified) complete with all attachments and accessories. All asmples to be approved prior to installment by the Engineer.				
	Total Carried forward				
j)	The entire electrical installation shall be tested for compliance in accordance to 16Th Edition of the IEE Wiring Regulation and witnessed/approved by the Engineer.				
k)	The contractor shall be required to produce shop drawings at commencement of works and "As Built Drawings" at completion of the works to approval of the Electrical Engineer (two sets hard copy and two sets soft copy).				

Item	Description	UNIT	QUANTITY	RATE(\$)	AMOUNT(\$)
	ELECTRICAL INSTALLATION OSBP MAIN BUILDING GROUND FLOOR				
	Supply, install, connect and set to work;				
A	Metal cased with lockable hinged door 12 way 400A TPN MCB type Distribution Board, complete with 300A TPN Mains Isolator, TP and SP MCBs, Spare ways with Blanking covers, Bus Bars, and all other accessories as per drawings to ABB, Havells/Mem shield manufacture or approved equivalent. The rate includes accurate labelling of all loads connected accordingly to the Board complete with earthing as per the drawing.	No	1.00		
B	Ditto but 8 way 100A TPN Distribution Board	No	1.00		
C	Ditto but 4 way 100A TPN Distribution Board to Air Conditioning Outdoor Units	No	1.00		
D	Ditto but 4 way 100A SPN Consumer Unit (clean power)	No	2.00		
E	4 core 25mm sq PVC/SWA/PVC copper cables for power supply connection from Main Distribution Board above to GDB 1 as indicated in the drawing.	m	35.00		
F	4 core 25mm sq PVC/SWA/PVC copper cables for power supply connection from Main Distribution Board above to UPS Equipment as indicated in the drawing.	m	50.00		
G	4 core 25mm sq PVC/SWA/PVC copper cables for power supply connection from Main Distribution Board above to VRV Air Conditioning Outdoor units as indicated in the drawing.	m	70.00		
H	4 core 10mm sq PVC/PVC copper cables for supply of clean power from the UPS to the consumer unit above.	m	40.00		
I	300x50mm galvanised steel perforated cable tray for ICT cables	m	60.00		
J	50mm diameter PN6 uPVC pipes for power and data sleeves	m	150.00		
K	75mm diameter PN6 uPVC pipes laid under ground to link up power/ICT power supplies.	m	200.00		
L	Lighting points wired from consumer unit with 3x2.5mm ² PVC cable drawn in new concealed PVC conduits with screwed joints complete with all boxes etc.	No	174.00		
M	48W(60x60) Slim Led Panel Amature Lamp as Makel LED series Cat.No PC48.0W-02008 type "S" or equal approved to BS/ Euro standards.	No	62.00		
N	Ditto but Emergency series type "SE" in the drawing	No	33.00		
	Total Carried forward				-
A	High Bay discharge luminaire with vertical lamp, aluminium/acrylic reflector IP21 As Thorn Hipak 1000	No	12.00		
B	1x28w surface mounted round fitting type 'C' complete with 2D lamp and white opal diffuser and lamp as thorn Super Club CLCDO 2D 28w.	No	12.00		
C	Ditto but Emmergency version type "E"	No	14.00		

Item	Description	UNIT	QUANTITY	RATE(\$)	AMOUNT(\$)
D	1X16w ceiling mounted round fitting type "D" complete with "D" white opal diffuser and lamp as thorn Cyster 2DCOY 16w	No	20		
E	Ceiling mounted Cowl Spot light type "DW" 50w low voltage dichotic Mains operated PAR 20 as thorn multi beam 50 TMDPS 50AW	No	7		
F	80W MBF wall mounted security luminaire with HPS-T lamp type "H" as Thorn or equal approved.	No	14		
G	One gang 1 way 6A moulded switch as MK or approved equal	No	40		
H	Two gang 1 way 6A moulded switch as MK or approved equal	No	0		
I	One gang 2way 6A moulded switch as MK or approved equal	No	13		
J	Two gang 2way 6A moulded switch as MK or approved equal	No	1		
K	Three gang 2way 6A moulded switch as MK or approved equal	No	13		
L	6A moulded Intermediate switch as MK or approved equal	No	1		
M	Socket outlet points wired from consumer Units by 3 X 2.5mm Sq PVC Copper cables in HG PVC conduit complete with all accessories	No	46		
N	Ditto but to clean power outlets	No	47		
O	Ditto to Hand Drier and Air Conditioner	No	31		
P	13A two gang non standard switched socket outlet as MK or equal approved	No	46		
Q	Ditto but one gang switched socket as MK or equal approved	No	47		
R	Ditto but two gang switched socket as MK or equal approved	No	47		
S	2KW 240V-50Hz Hand Drier as Sachia manufacture or equal approved.	No	6		
T	20A DP switch as MK or approved equal	No	31		
U	Voice/Data LJ Secondary Module flush mounting outlets on wall/tranking	No	47		
	Total Carried forward				-
A	3 compartment 192 X 60mm UPVC DADO trunking as made by Cente President complete with accessories such as compliers, angles, end caps 3 No. outlet boxes at each working stations etc laid along walls and under desks.	m	95		
B	3x32mm PVC Conduit in floor Slab/wall to link up clean power,voice,data working stations.	m	15		

Item	Description	UNIT	QUANTITY	RATE(\$)	AMOUNT(\$)
	ELECTRICAL INSTALLATION FIRST FLOOR				
	Supply, install, connect and set to work;				
C	Metal cased with lockable hinged door, 8 way TPN MCB type flush mounted Distribution board with 100A TP Main Intergral switch, bus bars, neutral and Earth terminal blocks, or as to Crabtree list No. 1806/21B c/w barrel lock as to Crabtree or equal and approved equal.	No	2.00		
D	Ditto but 4 way SPN MCB Consumer Unit for clean power.	No	2.00		
E	4 core 25mm sq PVC/SWA/PVC copper cable from Main Distribution Board to above mentioned DBs 2&3 shown in the drawing	m	40.00		
F	4 core 6mm ² PVC/ PVC Copper cable for UPS to Clean Power Consumer units mentioned above.	m	50.00		
G	Lighting points wired from consumer unit with 3x2.5mm ² PVC cable drawn in new concealed PVC conduits with screwed joints complete with all boxes etc.	No	176.00		
H	48W(60x60) Slim Led Panel Amature Lamp as Makel LED series Cat.No PC48.0W-02008 type "S" or equal approved to BS/ Euro standards.	No	98.00		
I	Ditto but Emergency series type "SE" in the drawing	No	39.00		
J	1x28w surface mounted round fitting type 'C' complete with 2D lamp and white opal diffuser and lamp as thorn Super Club CLCDO 2D 28w.	No	13.00		
K	Ditto but Emmergency version type "E"	No	9.00		
L	1X16w ceiling mounted round fitting type "D" complete with "D" white opal diffuser and lamp as thorn Cyster 2DCOY 16w	No	12.00		
M	1x70W HIT-DE lamp Recessed downlighter as Thorn Corsa 245H type "F" or equal approved.	No	18.00		
N	One gang 1 way 6A moulded switch as MK or approved equal	No	17.00		
O	Two gang 1 way moulde switch as MK or approved equal	No	9.00		
P	One gang 2way 6A moulded switch as MK or approved equal	No	13.00		
	Total Carried forward				-
A	Two gang 2way 6A moulded switch as MK or approved equal	No	2.00		
B	Three gang 2way 6A moulded switch as MK or approved equal	No	3.00		
C	6A Intermediate switch as MK or approved equal	No	2.00		

Item	Description	UNIT	QUANTITY	RATE(\$)	AMOUNT(\$)
D	Socket outlet points wired from consumer by 3 X 2.5mm Sq PVC Copper cables in HG PVC conduit complete with all accessories	No	45		
E	Ditto but to clean power outlets	No	47		
F	Ditto to Hand Drier and Air Conditioner	No	34		
G	13A two gang non standard switched socket outlet as MK or equal approved	No	45		
H	Ditto but one gang switched socket as MK or equal approved	No	47		
I	Ditto but two gang switched socket as MK or equal approved	No	10		
J	2KW 240V-50Hz Hand Drier as Sachia manufacture or equal approved.	No	4		
K	20A DP switch as MK or approved equal	No	34		
L	Voice/Data LJ Secondary Module flush mounting outlets on wall/tranking	No	45		
M	3 compartment 192 X 60mm UPVC DADO trunking as made by Cente President complete with accessories such as compliers, angles, end caps 3 No. outlet boxes at each working stations etc laid along walls and under desks.	m	125		
N	3x32mm PVC Conduit in floor Slab/wall to link up clean power,voice,data working stations.	m	15		
	LIGHTNING PROTECTION				
	Supply, install, connect and set to work:				
O	Copper tape of hard drawn high conductivity copper 3mm x 25mm cross section for horizontal and down conductors c/w fixing clips and all necessary accessories as by FURSE or equal approved in meters	m	14		
P	Air terminals c/w tape adapters, spikes and all accessories by FURSE or equal approved	No	1		
	Total Carried forward				-
A	Test clamp complete as by FURSE or equal approved	No	1		
B	Earth rods made from hard drawn copper or copper weld c/w cap, earth clamp, man hole and cover c/w accessories as by FURSE or equal approved.	ITEM	1		
	FIRE ALARM SYSTEM GROUND AND FIRST FLOORS				
C	4 Zone flush mounted self contained fire alarm annunciator panel as "Gents" or approved equal c/w battery back up	No	2		
D	Fire alarm bells c/w PVC flush conduit wired in 2.5mm sq fire resistant PVC/PVC copper cables a) Ground Floor	No	5		
	b) First Floor	No No	1		

Item	Description	UNIT	QUANTITY	RATE(\$)	AMOUNT(\$)
E	Break glass pushes as "Gents" or equal approved c/w flush cnduits wired in 2.5mm sq fire resistant copper cables				
	a) Ground Floor	No	5.00		
	b) First Floor	No	1.00		
F	Smoke detectors as "Gents" or approved equal c/w flush conduits wired in 2,5mm sq fire resistant copper cables				
	a) Ground Floor	No	31.00		
	b) First Floor	No	34.00		
G	Heat detectors as "Gents" or approved equal c/w flush conduits wired in 2.5mm sq fire resistant copper cables				
	a) Ground Floor	No	31.00		
	b) First Floor	No	34.00		
	MISCELLANEOUS ITEMS				
H	Allow for production of 3 sets of Hard and Soft copies for the electrical installations to be handed over to the Electrical Consoultant for approval and later submission to the Project Manager and Client for maintanece and records.	item	1.00		
I	Allow for witnessing of Tests and Comissioning the entire electrical installation as per code of practice and regulations by the Engineer.	item	1.00		
J	Allow for training of Clients staff in operations and maintenance of specialised equipment including provision of OM manuals.	item	1.00		
K	Allow for production of 3 sets of Hard and Soft copies for the electrical installations to be handed over to the Electrical Consoultant for approval and later submission to the Project Manager and Client for maintanece and records.	item	1.00		
L	Allow for witnessing of Tests and Comissioning the entire electrical installation as per code of practice and regulations by the Engineer.	item	1.00		
M	Allow for training of Clients staff in operations and maintenance of specialised equipment including provision of OM manuals.	item	1.00		
	Total Carried to GRAND SUMMARY				-
	TOTAL ELECTRICAL INSTALLATION CARRIED TO MAIN SUMMARY				-

AIR CONDITIONING INSTALLATION MAIN BUILDING-GALAFI

ITEM	DESCRIPTION	UNIT	QTY	RATE US\$	AMOUNT US\$
	<u>GROUND FLOOR</u> <u>ELEMENT NO.1</u> <i>Supply, install, test and commission the latest product range of VRF AC system as DAIKIN, LG,TOSHIBA with inverter compressor or equal approved air conditioning units as per the following cooling capacities and specifications c/w appropriate associated communication/ electrical wiring, condensate and refrigerant pipework, hangers and supports. All VRF outdoor units are located on roof level concrete plinth.</i> <u>VRF Outdoor Units</u> Model 22HP, 61.5kW cooling capacity, 16.37 kW-3N-400- 50HZ power consumption, R410A refrigerant, size 1240x765x1680 c/w vibration mountings, fixing brackets etc.	No.	2		
	<u>VRF Indoor Units</u> B Ecodesign round flow ceiling cassette, cooling capacity: 2.2kW - AC 4, c/w wired remote Controller C Ditto 3.6 Kw - AC3, c/w wired remote Controller D Ditto 5.6 Kw - AC2 c/w wired remote Controller E Ditto 7.1 Kw - AC1, c/w wired remote Controller F 415 -50HZ 3 Phase monitor with a trip and restart delays G 25-50mm PVC condensate drainage pipework c/w all fittings, supports, hangers, 20mm thick closed cell rubber insulation and aluminium foil cladding of appropriate guage. <i>Liquid and gas refrigerant piping for the above AC units as Daikiin/ LG/Toshiba/Carrier multi interlocking or equal and approved including insulation and supports</i> H 28.6mm I 19.1 mm J 15.9 mm K 12.7 mm L 9.52 mm M 6.35 mm N 1600x1100x100mm concrete support base for AC outdoor units on lower ground floor	NO NO NO NO No. ITEM ITEM ITEM ITEM ITEM ITEM ITEM No.	5 7 6 7 2 1 1 1 1 1 1 1 2		
	TOTAL CARRIED TO COLLECTION				-

ITEM	DESCRIPTION	UNIT	QTY	RATE US\$	AMOUNT US\$
	FIRST FLOOR ELEMENT NO.1 <u>Supply, install, test and commission the latest product range of VRF AC system as DAIKIN, LG, TOSHIBA with inverter compressor or equal approved air conditioning units as per the following cooling capacities and specifications c/w appropriate associated communication/ electrical wiring, condensate and refrigerant pipework, hangers and supports. All VRF outdoor units are located on roof level concrete plinth.</u> VRF Outdoor Units Model 30HP, 83.5kW cooling capacity, 23.7 kW-3N-400-50HZ power consumption, R410A refrigerant, size 1240x765x1680 c/w vibration mountings, fixing brackets etc. VRF Indoor Units B Ecodesign round flow ceiling cassette, cooling capacity: 3.6kW - AC 2, c/w wired remote Controller C Ditto 5.6 Kw - AC2 c/w wired remote Controller D Ditto 7.1 Kw - AC1, c/w wired remote Controller E Ditto 11.2 Kw - AC5, c/w wired remote Controller	No.	2		
	F Supply and install down flow, floor mounted, close control air conditioner unit (AC6) as per the following cooling capacities and specifications c/w appropriate associated electrical wiring, condensate and refrigerant pipe work and humidity detector. The units to be of LEIBERT HIROSS, UNIFLAIR or AIREDALE make or other equal and approved. (SERVER ROOM) 22.5kW Cooling, R410A refrigerant, power consumption 15kW 400V 3PH+N/50HZ. The installation shall be managed by microprocessor controller and the following parameters shall be generally controlled: Air return temperature, Temperature set point, Temperature differential, Humidity set point, Humidity differentials, Returned alarms, High temperature, Low temperature, High humidity, Low Humidity, Replace the filter, Air flow loss, Temperature probe fault, Humidity probe fault, High compressor pressure alarm The two units shall be programmed to run on duty and standby on 12 hour and weekly rotational basis. G 415 -50HZ 3 Phase monitor with a trip and restart delays H 25-50mm PVC condensate drainage pipework c/w all fittings, supports, hangers, 20mm thick closed cell rubber insulation and aluminium foil cladding of appropriate gauge.	NO.	2		
		NO.	4		
		ITEM	1		
	TOTAL CARRIED TO COLLECTION				
	<i>Liquid and gas refrigerant piping for the above AC units as Daikin/ LG/Toshiba/Carrier multi interlocking or equal and approved including insulation and supports</i> A 34.9mm B 28.6mm C 19.1 mm D 15.9 mm E 12.7 mm F 9.52 mm G 6.35 mm H 1600x1100x100mm concrete support base for AC outdoor units on lower ground floor I 600x600mm perforated floor tile fabricated out of anti-corrosion protected welded metal, the same thickness as solid tiles	ITEM	1		
		ITEM	1		
		ITEM	1		
		ITEM	1		
		ITEM	1		
		ITEM	1		
		ITEM	1		
		No.	3		
		No.	6		
	TOTAL CARRIED TO COLLECTION				-
	TOTAL AIR CONDITIONING INSTALLATION CARRIED TO MAIN SUMMARY				-