Republic of Kenya

Kenya Marine Fisheries Socioeconomic Development Project (KEMFSED)
P.O. Box 58187-00200
NAIROBI

MINISTRY OF MINING, BLUE ECONOMY AND MARITIME AFFAIRS

Request for Bids

CONSTRUCTION OF NAMARET RESOURCE CENTRE

Employer: State Department for Blue Economy & Fisheries
Project: Kenya Marine Fisheries Socio-Economic Development Project (KEMFSED)
Contract Title: **CONSTRUCTION OF NAMARET RESOURCE CENTRE**
Country: Republic of Kenya
Loan No./Credit No/Grant No.: 6540-KE
RFBNo.: KE-MOMBE&MA-KWL-2024-004-CW
Issued on: **13TH FEBRUARY 2024**

VOLUME 2 OF 4

BILLS OF QUANTITIES

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A. PREAMBLE

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions, Technical Specifications, and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices bid in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional Plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
7. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clauses 13.4 and 13.5 of the General Conditions except with respect to DAAB Fees and Expenses for which no instruction will be required from the Engineer.
8. The method of measurement of completed work for payment shall be Admeasurement in accordance with ICE Conditions of Contract measurement clauses.[1]

[1] The method of measurement should be spelled out precisely in the Preamble to the Bill of Quantities, describing for example the allowances (if any) for timbering in excavation, etc. Many national standard reference guides have been prepared on the subject, and one such guide is the Standard Method of Measurement of the U.K. Institution of Civil Engineers.

B. WORK ITEMS

1. The Bill of Quantities contains the following part Bills, which have been grouped according to the nature or timing of the work:

1. **BILL NO. 1: PARTICULAR PRELIMINARIES**
2. **BILL NO. 2: GENERAL PRELIMINARIES**
3. **BILL NO.3 2NO. HATCHERY BUILDING WORKS**
4. **BILL NO.4 ALGAE PRODUCTION BUILDING WORKS**
5. **BILL NO.5 3NO. WASHROOM BLOCKS BUILDING WORKS**
6. **BILL NO.6 POWER HOUSE BUILDING WORKS**
7. **BILL NO.7 REVERSE OSMOSIS ROOM BUILDING WORKS**
8. **BILL NO.8 PUMP ROOM BUILDING WORKS**
9. **BILL NO.9 2NO. STORAGE TANKS BUILDING WORKS**
10. **BILL NO.10 2 NO. TRIAL TANKS BUILDING WORKS**
11. **BILL NO.11 WETLAND BUILDING WORKS**
12. **BILL NO.12 BATTERY ROOM BUILDING WORKS**
13. **BILL NO.13 MECHANICAL WORKS**
14. **BILL NO.14 ELECTRICAL INSTALLATIONS**
15. **BILL NO.15 LANDSCAPING WORKS**
16. **BILL NO.16 CIVIL WORKS**
17. **BILL NO.17 OCEAN WATER INTAKE BUILDING WORKS**
18. **BILL NO.18 DAY WORKS**
19. **BILL NO.19 ESMP**
20. **BILL NO.2 CSR**

2. Bidders shall price the Bill of Quantities in local currency only and shall indicate in the Appendix to Bid the percentage expected for payment in foreign currency or currencies.

DAYWORK SCHEDULE

General

1. Reference should be made to Sub-Clause 13.5 of the General Conditions. Work shall not be executed on a daywork basis except by written order of the Engineer. Bidders shall enter basic rates for daywork items in the Schedules, which rates shall apply to any quantity of daywork ordered by the Engineer. Nominal quantities have been indicated against each item of daywork, and the extended total for Daywork shall be carried forward as a Provisional Sum to the Summary Total Bid Amount. Unless otherwise adjusted, payments for daywork shall be subject to price adjustment in accordance with the provisions in the Conditions of Contract.

Daywork Labour

2. In calculating payments due to the Contractor for the execution of daywork, the hours for labour will be reckoned from the time of arrival of the labour at the job site to execute the particular item of daywork to the time of return to the original place of departure, but excluding meal breaks and rest periods. Only the time of classes of labour directly doing work ordered by the Engineer and for which they are competent to perform will be measured. The time of gangers (charge hands) actually doing work with the gangs will also be measured but not the time of foremen or other supervisory personnel.

3. The Contractor shall be entitled to payment in respect of the total time that labour is employed on daywork, calculated at the basic rates entered by the Contractor in the Schedule of Daywork Rates: 1. Labour, together with an additional percentage payment on basic rates representing the Contractor's profit, overheads, etc., as described below:

   a) The basic rates for labour shall cover all direct costs to the Contractor, including (but not limited to) the amount of wages paid to such labour, transportation time, overtime, subsistence allowances, and any sums paid to or on behalf of such labour for social benefits in accordance with [country of Borrower]Kenya law. The basic rates will be payable in local currency only.

   b) The additional percentage payment to be quoted by the bidder and applied to costs incurred under (a) above shall be deemed to cover the Contractor's profit, overheads, superintendence, liabilities, and insurances and allowances to labour, timekeeping, and clerical and office work, the use of consumable stores, water, lighting, and power; the use and repair of stagings, scaffolding, workshops, and stores, portable power tools, manual plant, and tools; supervision by the Contractor's staff, foremen, and other supervisory personnel; and charges incidental to the foregoing. Payments under this item shall be made in local currency.

Daywork Materials

4. The Contractor shall be entitled to payment in respect of materials used for daywork (except for materials for which the cost is included in the percentage addition to labour costs as detailed heretofore), at the basic rates entered by the Contractor in the Schedule of Daywork Rates: 2. Materials, together with an additional percentage payment on the basic rates to cover overhead charges and profit, as follows:

a) the basic rates for materials shall be calculated on the basis of the invoiced price, freight, insurance, handling expenses, damage, losses, etc., and shall provide for delivery to store for stockpiling at the Site. The basic rates shall be stated in local currency, but payment will be made in the currency or currencies expended upon presentation of supporting documentation.

b) the additional percentage payment shall be quoted by the bidder and applied to the equivalent local currency payments made under (a) above. Payments under this item will be made in local currency.

c) the cost of hauling materials for use on work ordered to be carried out as daywork from the store or stockpile on the Site to the place where it is to be used will be paid in accordance with the terms for Labour and Construction in this schedule.

Daywork Contractor's Equipment

5. The Contractor shall be entitled to payments in respect of Contractor's Equipment already on Site and employed on daywork at the basic rental rates entered by the Contractor in the Schedule of Daywork Rates: **3. Contractor's Equipment.** Said rates shall be deemed to include due and complete allowance for depreciation, interest, indemnity, and insurance, repairs, maintenance, supplies, fuel, lubricants, and other consumables, the cost of drivers, operators, and assistants and all overhead, profit, and administrative costs related to the use of such equipment.

6. In calculating the payment due to the Contractor for Contractor's Equipment employed on daywork, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Engineer, the travelling time from the part of the Site where the Contractor's Equipment was located when ordered by the Engineer to be employed on daywork and the time for return journey thereto shall be included for payment.

7. The basic rental rates for Contractor's Equipment employed on daywork shall be stated in local currency, but payments to the Contractor will be made in local currency.

ITEM	DESCRIPTION	AMOUNT (KSHS)
	BILL NO 1: PARTICULAR PRELIMINARIES	
	(All Rates are V.A.T Inclusive)	
1.0.1	EMPLOYER	
	The Employer is MINISTRY OF MINING, BLUE ECONOMY AND MARITIME AFFAIRS	
	The term "Employer" and "MINISTRY OF MINING, BLUE ECONOMY AND MARITIME AFFAIRS" wherever used in the contract document shall be synonymous.	
1.0.2	PROJECT MANAGER	
	The term "PM" wherever used in these Bills of Quantities shall be deemed to imply the project Manager as defined in the Conditions of Contract or such person or persons as may be duly authorised to represent him/her on behalf of the employer.	
1.0.3	ARCHITECT	
	The term "Architect" shall be deemed to mean "The P.M " as defined above whose address unless otherwise notified is Project Engineer.	
1.0.4	QUANTITY SURVEYOR	
	The term "Quantity Surveyor" shall be deemed to mean "The P.M " as defined above whose address unless otherwise notified is Project Engineer.	
1.0.5	ELECTRICAL ENGINEER	
	The term "Electrical Engineer" shall be deemed to mean "The P.M " as defined above whose address unless otherwise notified is Project Engineer.	
1.0.6	MECHANICAL ENGINEER	
	The term "Mechanical Engineer" shall be deemed to mean "The P.M " as defined above whose address unless otherwise notified is Project Engineer.	
1.0.7	STRUCTURAL ENGINEER	
	The term "Structural Engineer" shall be deemed to mean "The P.M " as defined above whose address unless otherwise notified is Project Engineer.	
1.0.8	PROJECT ENGINEER (PE) (Member of NPCU, State Department of Fisheries)	
	The term "Project Engineer" shall be deemed to mean "The ENGINEER " as defined above whose address unless otherwise notified is National Project Coordination Unit (NPCU), State Department of Fisheries. P.O. Box 58187-00200 NAIROBI	
1.0.9	EMPLOYER'S REPRESENTATIVE	
	Wherever the term "Architect, Quantity Surveyor and Engineer" as defined above are used in all Contract Documents they shall be deemed to imply the "Employer's Representatives" and shall include such other persons as they may duly authorize to represent them on behalf of the Employer or the Successor in Office of such persons as may be deputed by such representatives to act on their behalf for the purpose of this Contract.	
1.0.10	CONTRACTOR	
	The term "the Contractor" wherever used hereinafter and in all Contract Documents shall mean the person or persons, partnership firm or Company whose Tender for the works hereinafter defined has been accepted by the Employer and who has, or have signed this Contract and shall include his or their heirs, executors, administrators, assignees, successors and duly appointed.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.0.11	LOCATION OF SITE The site of the proposed works is at Shimoni in Kwale County. The Contractor is advised to visit the site, to familiarize with the nature and position of the site. No claims arising from the Contractor's failure to do so will be entertained.	
1.0.12	DESCRIPTION OF THE WORKS The works to be carried out under this contract is the Construction of HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE. The project consists of the following: 1. Excavation & Earthworks including fillings 2. Waterproofing. 3. Concrete works 4. Reinforcement 5. Formwork. 6. Walling. 7. Roofing. 8. Doors 9. Windows 10. Fittings. 11. Finishes. 12. Mechanical works 13. Electrical Installations. 14. Landscaping works 15. Civil works	
1.0.13	FORM OF CONTRACT The Form of Contract shall be as stipulated in the Tender documents	
1.0.14	BID BOND A bid bond shall be required in the amount stated in the invitation to tender or advertisement.	
1.0.15	CLEARING AWAY The Contractor shall remove all temporary works, rubbish, debris and surplus materials from the site as they accumulate and upon completion of the works, remove and clear away all plant, equipment, rubbish, unused materials and stains and leave in a clean and tidy state to the reasonable satisfaction of the Project Manager. The whole of the works shall be delivered up clean, complete and in perfect condition in every respect to the satisfaction of the Project Manager.	
1.0.16	WORKING CONDITIONS The Contractor shall allow in his rates for any interferance that he may encounter in the course of the works for the Client may in some cases ask the Contractor not to proceed with the works until some activities within the site are completed, as the facility will be operating as usual during the course of the contract.The contractor must allow for compliance with all County & Statutory Authorities' laws & regulations.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.0.17	**CLAIMS** It shall be a condition of this contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and / or expenses due to any of the contract conditions, or by any other reason whatsoever, he shall present such a claim or intent to claim notice to the PROJECT MANAGER within the contract period. No claim shall be entertained upon the expiry of the said contact period.	
1.0.18	**LABOUR CAMPS** The Contractor shall not be allowed to house labour on site. Allow for transporting workers to and from the site during the tenure of the contract.	
1.0.19	**PRICING RATES** The tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. **Items for which no rate or price is entered by the tenderer will not be paid for when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities.** The tenderer shall include for all costs in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract. Prices quoted should be net inclusive of all taxes. Prices shall remain valid for One Hundred and twenty (120) days from the closing date of tender. The rates and prices quoted by the tenderer shall only be subject to adjustment during the performance of the Contract if provided for in the Appendix to Conditions of Contract and provisions made in the Conditions of Contract.	
1.0.20	**MATERIALS FROM DEMOLITIONS** Any materials arising from demolitions SHALL NOT BE re-used shall become the property of the client unless otherwise advised.	
1.0.21	**URGENCY OF THE WORKS** The Contractor is notified that these **" works are urgent"** and should be completed within the period stated in these Particular Preliminaries. The Contractor shall allow in his rates for any costs he/ she deems that he/she may incur by having to complete these works within the stipulated contract period.	
1.0.22	**PAYMENTS GENERALLY** The tenderer's attention is drawn to the fact that the client will only make advance payments and pay for work done and materials delivered to site: all in accordance with the Conditions of Contract Agreement. In order to facilitate this, a list of the general component elements for the works is given at the summary page of these specifications and the tenderer is requested to break down his tender sum commensurate to the said elements. The contractor is advised to deliver & concur on his claim for payment with the PE before the following site visit to enable approval of the same by the Acceptance & Approval Committee.The claim shall be prepared in the same format as these bills clearly showing quantities & rates (both work & materials). Both the PM & contractor should be able to locate & identify the items claimed from the main bill.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.0.23	PAYMENT FOR MATERIALS ON SITE All materials for incorporation in the works must be stored on site before payment is effected, unless specifically exempted by the Project Engineer. This is to include materials of the Contractor, nominated sub-Contractors and nominated suppliers.	
1.0.24	ADVANCE PAYMENTS The tenderer's attention if drawn to the fact that the Client does not make any advance payments	
1.0.25	EXISTING SERVICES Prior to the commencement of any work, the Contractor is to ascertain from the relevant authority the exact position, depth and level of all existing services in the area and he/she shall make whatever provisions may be required by the authorities concerned for the support, maintenance and protection of such services.	
1.0.26	TENDER DOCUMENTS Tender documents are as listed in the Instruction to Tenderers	
1.0.27	DELIVERY OF TENDER Tenders and all documents in connection therewith, as specified above must be delivered in the addressed envelope which should be properly sealed and deposited at the offices as specified in the letter accompanying these documents or as indicated in the advertisement. Tenders will be opened at the time specified in the letter accompanying these Tender Documents or as indicated in the advertisement. Tenders delivered/received later than the above time will not be opened.	
1.0.28	SIGNING OF THE TENDER DOCUMENTS The bidder shall append his / her signature and / or company 's rubberstamp on each and every page of tender document.	
1.0.29	MEASUREMENTS In the event of any discrepancies arising between the Bills of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any contract documents shall immediately be referred to the PROJECT ENGINEER in accordance with the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with the said Conditions.	
1.0.30	VALUE ADDED TAX The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1st September, 1993 which requires payment of VAT on all contracts. The Contractor should therefore include allowance in his rates and prices for prices for VAT and any other Government taxes currently in force. NB: The Contractor should therefore include the tax within the rates.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.0.31	CONTRACT COMPLETION PERIOD The contract completion period in accordance with conditions of the Conditions of contract must be adhered to. The 'ENGINEER' shall strictly monitor the Contractors progress in relation to the progress chart and should it be found necessary the 'PE' shall inform the Contractor in writing that his actual performance on site is not satisfactory. In all such cases the Contractor shall accelerate his rate of performance production and progress by all means such as additional labour,plant, e.t.c and working overtime all at his cost.	
1.0.32	GEOTECHNICAL SURVEY Allow a sum of **KES. 900,000.00** (Nine Hundred Thousand only) for conducting geotechnical survey on site before commencement of works. The survey and investigation to be conducted by a specialist subject to the Engineer's approval.	900,000.00
1.0.33	Record (As Installed) Drawings Prepare and submit three sets of record (as installed) plan and isometric layout drawings to easily readable scale, A1 or A0 paper size formart as follows: i) general arrangement drawings of all architectural Works ii) any other details as per specifications Drawings are to be submitted in soft copy (REVIT 2023) and hard copy to the client, the architect and the engineer. The soft copies to be stored in 1TB Harddisk and 32GB flash disc. Allow sum of **KES. 300,000.00** (Three Hundred Thousand only) for preparation and submitting draft and three final copies of operation, instruction and maintainance manuals to Engineers approvals.	300,000.00
1.0.34	Record (As Installed) Drawings Prepare and submit three sets of record (as installed) plan and isometric layout drawings to easily readable scale, A1 or A0 paper size formart as follows: i) general arrangement drawings of all Structural and Civil Works ii) any other details as per specifications Drawings are to be submitted in soft copy (AUTOCAD 2023) and hard copy to the client, the architect and the engineer. The soft copies to be stored in 1TB Harddisk and 32GB flash disc. Allow sum of **KES. 300,000.00** (Three Hundred Thousand only) for preparation and submitting draft and three final copies of operation, instruction and maintainance manuals to Engineers approvals.	300,000.00
	Carried to collection	1,500,000.00

ITEM	DESCRIPTION	AMOUNT (KSHS)
1.0.35	PARTICULARS OF INSERTIONS TO BE MADE IN APPENDIX TO CONTRACT AGREEMENT The following are the insertions to be made in the appendix to the Contract Agreement: - **Period of Final Measurement** - **3** Months From Practical completion **Defects Liability Period - 6** Months from Practical completion **Date for Possession -** To be agreed with the Engineer **Date for Completion - 12 months** from date of Possession **Liquidated and Ascertained -** At the rate of Kshs.. **100,000**… per week or part thereof: **Prime cost** sums for which the Contractor desires to tender …… **Period of Interim Certificates - After 2 Months** **Period of Honouring Certificates - 60** days **Percentage of Certified Value Retained -** 10% **Limit of Retention Fund -** 5%	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
	COLLECTION	
	Brought forward from page PP/1	
	Brought forward from page PP/2	
	Brought forward from page PP/3	
	Brought forward from page PP/4	
	Brought forward from page PP/5	1,500,000.00
	Brought forward from page PP/6	
	TOTAL FOR PARTICULAR PRELIMINARIES CARRIED TO GRAND SUMMARY	

ITEM	DESCRIPTION	AMOUNT (KSHS)
	(All Rates are V.A.T Inclusive) BILL NO 2; GENERAL PRELIMINARIES	
2.0.1	PRICING OF ITEMS OF PRELIMINARIES AND PREAMBLES Prices will be inserted against items of Preliminaries in the Contractor's priced Bills of Quantities and Specification. The Contractor shall be deemed to have included in his prices or rates (V.A.T Inclusive) for the various items in the Bills of Quantities or Specification for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract. Failure to price an item shall not exempt the contractor form carrying out works described therein. Should the contractor fail to carry out works which he/she did not price and after having received a written instruction from the PM, then the value of such works shall be deducted from the very immediate certificate issued to the contractor. MoPW current rates, JBC, IQSK, manufacturers or fair rates shall be used by the PM in valuation of unpriced items which the contractor shall fail to execute. The contractor is advised to read and understand all preliminary items. The Contractor is advised to visit the site, to familiarize with the nature and position of the site. No claims arising from the Contractor's failure to do so will be entertained.	
2.0.2	FIRM PRICE CONTRACT Unless otherwise specifically stated in the Contract Data and/or Particular preliminaries this is a firm price contract and the contractor must allow in his tender rates for any increase in the cost of labour and/or materials during the currency of the contract.	
2.0.3	VISIT SITE AND EXAMINE DRAWINGS The Contractor is recommended to examine the drawings and visit the site the location of which is described in the Particular Preliminaries hereof. He shall be deemed to have acquainted himself therewith as to its nature, position, means of access or any other matter which, may affect his tender. No claim arising from his failure to comply with this recommendation will be considered.	
2.0.4	SUFFICIENCY OF TENDER The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of this tender for the works and of the rates and prices stated in the Priced Bills of Quantities, which rates and prices shall cover all his obligations under the Contract and all matters that are necessary for the proper completion and maintenance of the works.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.5	**BONDS** The Contractor shall find and submit with the Form of Tender a guarantor and who will be willing to be bound the Government in the amount of the bond. The amount of the bond is SPECIFIED IN THE INVITATION TO TENDER The guarantor shall be an approved institution as specified in the invitation to tender and who will when and if called upon, sign a Bond to that effect on the relevant standard form included herein. (without the addition of any limitations) on the same day as the Contract Agreement is signed, by the Government, the Contractor shall furnish within seven days another Surety to the approval of the Government.	
2.0.6	**PERFOMANCE BOND** Specified amount of bond in the tender documents shall be required from the specified institution. The period for supplying the bond shall be specified in the tender documents. No contract shall be signed, NOR shall any payment be made before the bidder has complied with the bond requirements Failure to deliver the bond within the specified period shall automatically disqualify the bidder and the tender shall be awarded to next most responsive bidder without reference to the defaulting bidder. Should the bidder commence works and subsequently fail to provide the bond, he shall be evicted from site without any reimbursement not withstanding the site having been handed over by the PM and client. The handing over only kick-starts the process and is not a waiver to bond conditions. The bond for the due performances of the Contract shall be valid up to the date of completion as certified by the ENGINEER. Any bond which provides otherwise or attempts to vary the duration of validity shall be invalid. The bond shall comply in all respects with the PPOA copy enclosed in the instructionsto tender. A bond that does not match the Specified copy shall be treated as NO BOND	
2..07	**EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT** **Attendance ;** Clause B19(a) of the Standard Method of Measurement is deleted and the following clause is substituted:- Attendance on nominated Sub-Contractors shall be given as an item in each case shall be deemed to include: allowing use of standing scaffolding, mess rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary; providing space for office accommodation and for storage of plant and materials; providing light and water for their work: clearing away rubbish; unloading checking and hoisting: providing electric power and removing and replacing duct covers, pipe casings and the like necessary for the execution and testing of Sub- Contractors' work and being responsible for the accuracy of the same. **Fix Only:-** "Fix Only" shall mean take delivery at nearest railway station (Unless otherwise stated), pay all demurrage charges, load and transport to site where necessary, unload, store, unpack, assemble as necessary, distribute to position, hoist and fix only.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.8	**ABBREVIATIONS** Throughout these Bills, units of measurement and terms are abbreviated and shall be interpreted as follows:- **C.M.** Shall mean cubic metre **S.M.** Shall mean square metre **L.M.** Shall mean linear metre **MM** Shall mean Millimetre **Kg.** Shall mean Kilogramme **No.** Shall mean Number **Prs.** Shall mean Pairs **B.S.** Shall mean the British Standard Specification Published by the British Standards Institution, 2 Park Street, London W.I., England. **"K.S"** Shall mean the current Kenya Standard specification published by the Kenya Bureau of Standards, P.O. Box 54974, NAIROBI, Kenya. **Ditto** Shall mean the whole of the preceding description except as qualified in the description in which it occurs. **m.s.** Shall mean measured separately. **a.b.d** Shall mean as before described. **"Approved"** Shall mean approved by the Project Manager and the Employer in writing. **"As directed"** Shall mean as directed by the Project Manager and the Employer in writing. **"Demolish"** Shall be deemed to mean cutting away, breaking up, demolishing, pulling down, taking down, removing, etc., as the context requires and shall include in all cases temporarily strutting and supporting and making good remaining work as necessary, and clearing away and removing from Site all debris, etc. **"Remove"** Shall mean taking down, hacking up, breaking down, removing etc., and clearing away from Site and all other expenses thereby entailed. **"Make good"** Shall be deemed to mean all making good, fitting, facing up, plastering, paving, repairing and painting to match and jointing to remaining existing work. **To "match"** Shall mean to be equal to relevant existing work in design, workmanship and all other respects. **"Re-fix"** Shall apply to existing materials arising from the Works and shall mean take from store and fix in new position, including making good, repairing and adjusting as necessary.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.9	PLANT, TOOLS AND VEHICLES Allow for providing all scaffolding, plant, tools and vehicles required for the works except in so far as may be stated otherwise herein and except for such items specifically and only required for the use of nominated Sub-Contractors as described herein. No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.	
2.0.10	TRANSPORT. Allow for transport of workmen, materials, etc., to and from the site at such hours and by such routes as may be permitted by the competent authorities.	
2.0.11	MATERIALS AND WORKMANSHIP. All materials and workmanship used in the execution of the work shall be of the best quality and description unless otherwise stated. The Contractor shall order all materials to be obtained from overseas immediately after the Contract is signed and shall also order materials to be obtained from local sources as early as necessary to ensure that they are onsite when required for use in the works. The Bills of Quantities shall not be used for the purpose of ordering materials.	
2.0.12	SIGN FOR MATERIALS SUPPLIED. The Contractor will be required to sign a receipt for all articles and materials supplied by the PROJECT MANAGER at the time of taking deliver thereof, as having received them in good order and condition, and will thereafter be responsible for any loss or damage and for replacements of any such loss or damage with articles and/or materials which will be supplied by the PROJECT MANAGER at the current market prices including Customs Duty and V.A.T., all at the Contractor's own cost and expense, to the satisfaction of the PROJECT MANAGER	
2.0.13	STORAGE OF MATERIALS The Contractor shall provide at his own risk and cost where directed on the site weather proof lock-up sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the PROJECT MANAGER Nominated Sub-Contractors are to be made liable for the cost of any storage accommodation provided especially for their use.	
2.0.14	ORDERING OF MATERIALS The Contractor must assist in alleviating the effects of possible shortages of materials by advance ordering of materials in order to maintain a continuous supply. Early delivery of materials will be permitted and included in interim certificates and upon request by the Project Manager, the Contractor will be required to produce copies of order forms and invoices to establish that materials have been ordered in sufficient time and to check on material deliveries.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.15	SAMPLES The Contractor shall furnish at his own cost any samples of materials or workmanship required for the works that may be called for by the PROJECT MANAGER for his approval until such samples are approved by the PROJECT MANAGER and the PROJECT MANAGER, may reject any materials or workmanship not in his opinion to be up to approved samples. The PROJECT MANAGER shall arrange for the testing of such materials as he may at his discretion deem desirable, but the testing shall be made at the expense of the Contractor and not at the expense of the PROJECT MANAGER. The Contractor shall pay for the testing in accordance with the current scale of testing charges laid down by the Ministry of Public Works. The procedure for submitting samples of materials for testing and the method of marking for identification shall be as laid down by the PROJECT MANAGER The Contractor shall allow in his tender for such samples and tests except those in connection with nominated sub-contractors' work. Samples of paint, carpets, curtains & covers, tiles & timber shall be required for approval by the PM together with the employer. No alternate rate shall be offered on account that the employer has chosen a superior finish unless the bidder had attached the sample he priced.	
2.0.16	PUBLIC AND PRIVATE ROADS. Maintain as required throughout the execution of the works and make good any damage to public or private roads arising from or consequent upon the execution of the works to the satisfaction of the local and other competent authority and the PROJECT MANAGER.	
2.0.17	EXISTING PROPERTY. The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains and other services and he will be held responsible for and shall make good all such damage arising from the execution of this contract at his own expense to the satisfaction of the PROJECT MANAGER.	
2.0.18	ACCESS TO SITE AND TEMPORARY ROADS. Means of access to the Site shall be agreed with the PROJECT MANAGER prior to commencement of the work and Contractor must allow for building any necessary temporary access roads for the transport of the materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, crossings, bridges, or any other means of gaining access to the Site. Upon completion of the works, the Contractor shall remove such temporary access roads; temporary culverts, bridges, etc., and make good and reinstate all works and surfaces disturbed to the satisfaction of the PROJECT MANAGER.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.19	AREA TO BE OCCUPIED BY THE CONTRACTOR The area of the site which may be occupied by the Contractor for use of storage and for the purpose of erecting workshops, etc., shall be defined on site by the PROJECT MANAGER.	
2.0.20	SECURITY OF WORKS ETC. 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 must provide all necessary watching, lighting and other precautions as necessary to ensure security against theft, loss or damage and the protection of the public.	
2.0.21	PROGRESS CHART. The Contractor shall provide within two weeks of Possession of Site and in agreement with the PROJECT MANAGER a Progress Chart for the whole of the works including the works of Nominated Sub-Contractors ; one copy to be handed to the PROJECT MANAGER and a further copy to be retained on Site. Progress to be recorded and chart to be amended as necessary as the work proceeds.	
2.0.22	INSURANCE The Contractor shall insure as required in Conditions No 30 of the Conditions of Contract. No payment on account of the work executed will be made to the Contractor until he has satisfied the PROJECT MANAGER either by production of an Insurance Policy or and Insurance Certificate that the provision of the foregoing Insurance Clauses have been complied with in all respects. Thereafter the PROJECT MANAGER shall from time to time ascertain that premiums are duly paid up by the Contractor who shall if called upon to do so, produce the receipted premium renewals for the PROJECT MANAGER's inspection.	
2.0.23	CONTRACTOR'S SUPERINTENDENCE/SITE AGENT The Contractor shall constantly keep on the works a literate English speaking Agent or Representative, competent and experienced in the kind of work involved who shall give his whole experience in the kind of work involved and shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor all directions and instructions from the Project Manager and such directions shall be deemed to have been given to the Contractor in accordance with the Conditions of Contract.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.24	PROVISIONAL WORK All work described as "Provisional" in these Bills of Quantities is subject to remeasurement in order to ascertain the actual quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract shall left uncovered for a reasonable time to allow all measurements needed for such adjustment to be taken by the PROJECT MANAGER Immediately the work is ready for measuring, the Contractor shall give notice to the PROJECT MANAGER. If the Contractor makes default in these respects he shall if the PROJECT MANAGER so directs uncover the work to enable all measurements to be taken and afterwards reinstate at his own expense.	
2.0.25	PROVISIONAL SUMS. The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7(i) of the Standard Method of Measurement. Such sums are net and no addition shall be made to them for profit.	
2.0.26	ADJUSTMENT OF PROVISIONAL SUMS. In the final account all Provisional Sums shall be deducted and the value of the work properly executed in respect of them upon the PROJECT MANAGER's order added to the Contract Sum. Such work shall be valued , but should any part of the work be executed by a Nominated Sub-Contractor, the value of such work or articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.	
2.0.27	PRIME COST (OR P.C.) SUMS. The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7 (ii) of the Standard Method of Measurement . Persons or firms nominated by the PROJECT MANAGER to execute work or to provide and fix materials or goods are described herein as Nominated Sub Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.28	ADJUSTMENT OF P.C. SUMS. In the final account all P.C. Sums shall be deducted and the amount properly expended upon the PROJECT MANAGER'S order in respect of each of them added to the Contract sum. The Contractor shall produce to the PROJECT MANAGER such quotations, invoices or bills, properly receipted, as may be necessary to show the actual details of the sums paid by the Contractor. Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance" (as previously described) following P.C. Sums shall be adjusted pro-rata to the physical extent of the work executed (not pro-rata to the amount paid) and this shall apply even though the Contractor's priced Bill shows a percentage in the rate column in respect of them. Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C. Sum is included in these Bill of Quantities profit and attendance will be allowed at the same rate as it would be if the work were executed by a Nominated Sub-Contractor.	
2.0.29	NOMINATED SUB-CONTRACTORS When any work is ordered by the PROJECT MANAGER to be executed by nominated sub-contractors, the Contractor shall enter into sub-contracts and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such Sub-Contractors any or all of the facilities described in these Preliminaries. The Contractor should price for these with the nominated Sub contract Contractor's work concerned in the P.C. Sums under the description "add for Attendance".	
2.0.30	DIRECT CONTRACTS Notwithstanding the foregoing conditions, the Client reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum the priced Bills of Quantities will be adjusted as described for P.C. Sums and allowed.	
2.0.31	ATTENDANCE UPON OTHER TRADESMEN, ETC. The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this Contract every facility for carrying out their work and also for use of his ordinary scaffolding. The Contractor, however, shall not be required to erect any special scaffolding for them. The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the PROJECT MANAGER and the work will be measured and paid for to the extent executed at rates provided in these Bills.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.32	OFFICE ETC. FOR THE PROJECT MANAGER The Contractor shall provide, erect and maintain where directed on site a properly ventilated lockable office for the consultants, having a minimum floor area of 40 Square Metres complete with furniture (Tables, chairs e.t.c). Provision shall be made for artificial lighting and cleaning facilities for the duration of the works. Upon clompletion the Contractor shall dismantle and clear away the office. He shall also provide a strong metal trunk complete with strong hasp and staple fastening and two keys. He shall provide, erect and maintain a lock-up type water or bucket closet for the sole use of the PROJECT MANAGER including making temporary connections to the drain where applicable to the satisfaction of Government and Medical Officer of Health and shall provide services of cleaner and pay all conservancy charges and keep both office and closet in a clean and sanitary condition from commencement to the completion of the works and dismantle and make good disturbed surfaces. The office and closet shall be completed before the Contractor is permitted to commence the works. The Contractor shall make available on the Site as and when required by the "PROJECT MANAGER" a modern and accurate level together with levelling staff, ranging rods and 50 metre metallic or linen tape.	
2.0.33	WATER AND ELECTRICITY SUPPLY FOR THE WORKS The Contractor shall provide at his own risk and cost all necessary water, electric lightling and power required for use in the works. The Contractor must make his own arrangements for connection to the nearest suitable water main and for metering the water used. He must also provide temporary tanks and meters as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the PROJECT MANAGER . The Contractor shall pay all charges in connection herewith. No guarantee is given or implied that sufficient water will be available from mains and the Contractor must make his own arrangements for augmenting this supply at his own cost. Nominated Sub--contractors are to be made liable for the cost of any water or electric current used and for any installation provided especially for their own use.	
2.0.34	SANITATION OF THE WORKS The Sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Government and/or Local Authorities, Labour Department and the PROJECT MANAGER.	
2.0.35	SUPERVISION AND WORKING HOURS The works shall be executed under the direction and to the entire satisfaction in all respects of the PROJECT MANAGER who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and sub-Contractors or other places where work is being prepared for the contract.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.36	PROTECTION OF THE WORKS. Provide protection of the whole of the works contained in the Bills of Quantities, existing property, finishes, workmen employed on the site, employer's agents and the public; including casing , casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the PROJECT MANAGER and remove such protection when no longer required and make good any damage which may nevertheless have been done at completion free of cost to the Client. Any damage or loss incurred due to the insufficiency of such protection must be made good by the Contractor	
2.0.37	WORKS TO BE DELIVERED UP CLEAN Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works and remove all marks, blemishes, stains and defects from joinery, fittings and decorated surfaces generally, polish door furniture and bright parts of metalwork and leave the whole of the buildings watertight, clean, perfect and fit for occupation to the approval of the PROJECT MANAGER.	
2.0.38	GENERAL SPECIFICATION. For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Ministry of Roads and Public Works and Housing General Specification dated 1976 or any subsequent revision thereof which is issued as a separate document, and which shall be allowed in all respects unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities.	
2.0.39	TRAINING LEVY The Contractor's attention is drawn to the legal notice which requires payment by the Contractor of a Training Levy at the rate of 1/4 % of the Contract sum on all contracts of more than KShs. 50,000.00 in value.	
2.0.40	MATERIALS ON SITE All materials for incorporation in the works must be stored on or adjacent to the site before payment is effected unless specifically exempted by the PROJECT MANAGER. This includes the materials of the Main Contractor, Nominated Sub-Contractors and Nominated Suppliers.	
2.0.41	HOARDING The Contractor shall enclose the site or part of the works under construction with a hoarding 2400 mm high consisting of iron sheets on 100 x 50 mm timber posts firmly secured at 1800 mm centres with two 75 x 50 mm timber rails. The Contractor is in addition required to take all precautions necessary for the safe custody of the works, materials, plant, public and Employer's property on the site.	
2.0.42	ALTERATIONS TO BILLS, PRICING, ETC. Any unauthorised alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items against which no price has been inserted in the priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.43	MATERIALS ARISING FROM EXCAVATIONS Materials of any kind obtained from the excavations shall be the property of the client. Unless the PROJECT MANAGER directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution of materials which the Contractor would otherwise have had to supply with the written permission of the PROJECT MANAGER Should such permission be given, the Contractor shall make due allowance for the value of the materials so used at a price to be agreed.	
2.0.44	PREVENTION OF ACCIDENT, DAMAGE OR LOSS The Contractor is notified that these works are to be carried out on a restricted site where the client is going on with other nomal activities. The Contractor is thus instructed to take reasonable care in the execution of the works as to prevent accidents, damage or loss and disruoption of activities beeing carried out by the Client. The Contractor shall allow in his rates any expense he deemed necessary by taking such care within the site.	
2.0.45	GOVERNMENT ACTS REGARDING WORK, PEOPLE ETC. Allow for complying with all Government Acts, Orders and Regulations in connection with the employment of Labour and other matters related to the execution of the works. In particular the Contractor's attention is drawn to the provisions of the Factory Act 1950 and his tender must include for all costs arising or resulting from compliance with any Act, Order or Regulation relating to Insurances, pensions and holidays for workpeople or so the safety, health and welfare of the workpeople. The Contractor must make himself fully acquainted with current Acts and Regulations, including Police Regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc. It is most important that the Contractor, before tendering, shall obtain from the relevant Authority the fullest information regarding all such regulations and/or restrictions which may affect the organisation of the works, supply and control of labour, etc., and allow accordingly in his tender. No claim in respect of want of knowledge in this connection will be entertained.	
2.0.46	BLASTING OPERATIONS Blasting will only be allowed with the express permission of the PROJECT MANAGER in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost in accordance with any Government regulations in force for the time being, and any special regulations laid down by the PROJECT MANAGER governing the use and storage of explosives.	
2.0.47	SIGNBOARD Allow for providing, erecting, maintaining throughout the course of the Contract and afterwards clearing away a signboard as designed, specified and approved by the Project Manager.	
	Carried to collection	

ITEM	DESCRIPTION	AMOUNT (KSHS)
2.0.48	NUISANCE The Contractor must take such steps and exercise such care and diligence so as to minimize nuisance from dust, noise or any other cause, to the occupiers of adjacent properties	
2.0.49	PROTECTION OF TREES The Contractor shall in the course of construction take all necessary precautions to preserve any existing trees. The contractor will not cut down any tree(s) without express authority or written instruction by the Project Manager and relevant authorities. He must at all times liaise with the Project Manager in this regard. The cost of obtaining any necessary permits will be borne by the Contractor.	
2.0.50	EXTENDED PRELIMINARIES In case the Contractor suffers costs due to extended preliminaries as a result of excusable delays. Then the Employer shall compensate the Contractor the ACTUAL COST of such extended preliminaries plus 10% administrative costs. Such costs will be proven with payment receipts, payroll etc. No further claims shall be allowed with respect to the same.	
2.0.51	TIMELY PAYMENT FOR LABOURERS The Contractor shall ensure that his workers are paid their wages promptly and on time. If such payments are effected weekly the Contractor shall ensure that workers are paid on the appointed day to avoid any disruption of work occasioned by the failure of the Contractor to pay workers on time and shall be required to furnish proof to that effect,	
	Carried to collection	

BILL OF QUANTITIES FOR PROPOSED HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE

ITEM	DESCRIPTION	AMOUNT (KSHS)
	COLLECTION	
A	Brought Forward From Page GP/1	
B	Brought Forward From Page GP/2	
C	Brought Forward From Page GP/3	
D	Brought Forward From Page GP/4	
E	Brought Forward From Page GP/5	
F	Brought Forward From Page GP/6	
G	Brought Forward From Page GP/7	
H	Brought Forward From Page GP/8	
J	Brought Forward From Page GP/9	
K	Brought Forward From Page GP/10	
L	Brought Forward From Page GP/11	
M	Brought Forward From Page GP/12	
	TOTAL FOR GENERAL PRELIMINARIES CARRIED TO GRAND SUMMARY	

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 3; HATCHERY BUILDING WORKS ELEMENT NO 3.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
3.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	689		
3.1.2	Excavate oversite average 150 mm deep and cart away	SM	689		
3.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	531		
3.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	115		
3.1.5	Extra over excavation from rock in any position	CM	646		
	Disposal of excavated material				
3.1.6	Return, fill and ram extra excavation materials around foundation	CM	450		
3.1.7	Load and cart away surplus material	CM	196		
	Disposal of Water				
3.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
3.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
3.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	207		
3.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	689		
	Insecticide Treatment				
3.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	689		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	BROUGHT FORWARD				
	CONCRETE WORKS				
3.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15/20)	SM	430		
	Vibrated reinforced concrete class 25/20 to:-				
3.1.14	Strip footing	CM	54		
3.1.15	Columns Bases	CM	31		
3.1.16	Stub Columns	CM	4		
3.1.17	150 mm Thick ground floor slab	SM	689		
3.1.18	150 mm Thick sloping ramp slab	SM	49		
3.1.19	Extra over ditto to forming or leaving 450mm wide shallow drainage channels , average 450mm deep 'U' channel in hardcore and floor slab including hand packing to sides of channel, 200mm thick concrete to sides and bed of channel including 50mm blinding and all necessary formwork and reinforcement, all to detail and approval	LM	52		
	High Tensile Ribbed Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
3.1.20	Assorted bars	KG	13,350		
3.1.21	BRC mesh type A142	SM	738		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
3.1.22	Edges of strip footing	SM	177		
3.1.23	Ditto but to column bases	SM	92		
3.1.24	Ditto but to sides of foundation columns	SM	62		
3.1.25	Ditto but to edges of floor slab 150mm - 225mm thick	LM	105		
3.1.26	Ditto but to edges of Ramps 150mm - 225mm thick	LM	19		
	FOUNDATION WALLING				
3.1.27	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	425		
	WATERPROOFING				
3.1.28	1000 gauge polythene DPM	SM	738		
	PLINTH FINISHES				
3.1.29	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	53		
	Painting and Decoration				
3.1.30	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	53		
	TOTAL ELEMENT NO. 3.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 3.2				
	SUPERSTRUCTURE REINFORCED CONCRETE WORKS				
	Vibrated Reinforced Concrete Class - 25/20 to:-				
3.2.1	Ring beams	CM	15		
3.2.2	Columns	CM	13		
3.2.3	Concrete gutters	CM	14		
3.2.4	150 mm thick suspended slab	SM	127		
	High Tensile Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
3.2.5	Asorted bars	KG	9,158		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
3.2.6	Sides and soffits of Beams	SM	176		
3.2.7	Sides and soffits of gutters	SM	116		
3.2.8	Sides of columns	SM	131		
3.2.9	Soffits of suspended slab	SM	127		
3.2.10	Edges of slabs 75-150 mm high	LM	64		
	TOTAL FOR ELEMENT NO. 3.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 3.3 WALLING				
3.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course externally	SM	289		
3.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course internally.	SM	123		
3.3.1	Ditto but 200 mm thick parapet walling ditto	SM	70		
	Arches				
3.3.4	Extra over 200 mm for forming curved arches 1000 - 3000 mm diameter including all necessary materials.	NO	16		
	WATERPROOFING				
3.3.3	Hessian based bituminous felt damp proof course 200mm wide	LM	135		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	WALLING CONTINUED...				
	BROUGHT FORWARD				
	Precast concrete coping				
3.3.4	300 x 75 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	100		
3.3.5	Ditto 550 x 350mm pier cap ditto to columns	NO	20		
	Precast Concrete Louvre Block Walling				
3.3.6	200 mm thick approved precast concrete louvre block walling bedded and jointed in cement sand (1:3) mortar, reinforced with 25mm x 3mm thick hoop iron strip in every alternate course	SM	63		
	TOTAL FOR ELEMENT NO. 3.3 (WALLING), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 3.4 ROOFING STEEL TRUSSES				
	The following in trusses, girders and independednt members made of cold-rolled light gauge Steel Sections including grinding all welds smooth and painting with red oxide primer before delivery to site, then welded and bolted with gusset plates, head, nuts, washers and all other necessary fittings in accordance with the fabricators shop drawings to the Engineer's approval				
3.4.1	75 x 50 x 3mm Thick (5.42Kg/m) R.H.S external members welded to gusset plate	LM	687		
3.4.2	50 x 50 x 3mm Thick (4.43Kg/m) S.H.S struts and ties	LM	539		
3.4.3	177.8 x 50.8 x 2mm Thick (5.90Kg/m) Zed purlins welded to rafters	LM	468		
	Sundries				
3.4.4	200 x 100 x 8 mm mild steel base plates with 4 no. holes countersunk of diameter 18 mm for 16 mm diameter x 200 mm long bolts	NO.	30		
3.4.5	100 x 75 x 6 mm thick angle cleats 2 no. holes countersunk of diameter 14 mm for 12 mm diameter rag bolts; welded to truss rafter and bolted with 2no. M12 bolts to base plate.	NO.	120		
3.4.6	75 x 75 x 6 mm thick angle cleats 2 no. holes countersunk of diameter 14 mm for 12 mm diameter rag bolts; welded to truss rafter and bolted with 2no. M12 bolts to the Z - purlins	NO.	270		
3.4.7	16 mm diameter x 200 mm long bolts with head , nut and washers : fixed to concrete or masonry walls	NO.	120		
3.4.8	12 mm diameter x 100 mm long grade 4.6 bolts with head , nut and washers : fixed to truss members.	NO.	780		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ROOFING CONTINUED…				
	BROUGHT FORWARD				
	ROOF COVERING				
3.4.9	28 Gauge prepainted Corrugated aluminium roofing sheets fixed with and including bolts, nails, cups and washer on purlins and rafter sides as (high quality) or approved equivalent	SM	583		
3.4.10	Ditto but matching ridge caps and Valley Gutters	LM	26		
3.4.11	10,000Litres 2400mm x 2800mm. The tank has screwed connections for inlet, outlet, no overflow, 25mm medium pressure ball valve. A 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	1		
	FLAT ROOF FINISHES				
3.4.12	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	127		
3.4.13	Apply one coat bituminous primer to surface of screed.	SM	127		
3.4.14	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	127		
3.4.15	Ditto sides of wall 200mm high	LM	100		
3.4.16	50 x 50mm internal angle fillet	LM	100		
3.4.16	200 x 200 x 25mm thick high quality interlocking concrete tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	127		
3.4.17	Ditto sides of wall 200mm high	LM	100		
	Rainwater goods				
3.4.18	Extra over for running outlet	NO	10		
3.4.19	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	40		
3.4.20	Extra over for swan neck 1000mm long	NO	10		
3.4.21	Extra over for shoe 1000mm long	NO	10		
	TOTAL FOR ELEMENT NO. 3.4 (ROOFING) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 3.5 WINDOWS ALUMINIUM FRAMED GLAZED WINDOWS Supply, assemble and fix the following purpose made powder coated aluminium framed sliding windows to B.S 3987, 1984 from approved manufacturer(s) complete with mullions, transomes, railing and necessary intermediate reinforcement elements including all weather strips, rubber glazing strips,couplings, sliding rails bars, window cills and window boards; panes fixed with 6mm thick one way glass fixed with beadings.				
3.5.1	Overall size 4100mm x 450mm high	N0	4		
	TOTAL FOR ELEMENT NO. 3.5 (WINDOWS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 3.6 DOORS Wrot Mvule, or equal and approved Hardwood				
3.6.1	50mm Thick(finished) framed double leaves swing door size 1,500 x 2400mm high comprising of 300mm high fanlight and two equal openable leaves; 150 x 45mm grooved top rails and stiles, 200 x 45mm grooved bottom and middle rails, 20mm thick panel infills all finished for painting (m.s)	NO	10		
	FRAMES				
3.6.2	150 x 50mm once rebated frame with labour: plugged	LM	78		
3.6.3	45 x 38mm architrave	LM	78		
3.6.4	25mm diameter quadrant	LM	78		
	Suply and fix the following ironmongery all to 'industrial galvanised' or equal and approved specification				
3.6.5	100mm heavy duty brass butt hinges	PRS	30		
3.6.6	Three lever rebated door lock complete with furniture	NO	10		
3.6.7	Rubber door stop	NO	20		
3.6.8	Door closer hold open power 2/3 (with cover)	NO	10		
	Signage				
3.6.9	Supply and fix Stainless steel satin Rectangular signage size 150 x 75mm	NO	10		
	Glazing				
3.6.10	5mm clear sheet glass with putty and beadings to detail.	SM	5		
	TOTAL FOR ELEMENT NO. 3.6 (DOORS), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 3.7				
	FINISHES				
	External Wall Finishes				
3.7.1	15mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	359		
3.7.2	Prepare and apply 3 coats of first quality exterior silicone paint to plastered surfaces.	SM	359		
	Internal Wall Finishes				
3.7.3	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	375		
3.7.4	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	375		
	Wall Tiles				
3.7.5	150 x 150 x 6mm Thick White glazed ceramic wall tiles bedding and jointing in cement and sand (1:3) mortar and flush pointed with white cement:	SM	160		
	Floor Finishes				
	Cement and sand (1:4) screeding smooth trowelled				
3.7.6	32mm Thick floor screed to floor finihses	SM	627		
	Terrazzo paving				
3.7.7	20 mm Thick homogenous mix terrazzo laid on screed backing; cement sand marble chippings (1:4:8) grinded and polished including dividing strips.	SM	627		
3.7.8	Ditto but to 100 mm high skirting	LM	326		
3.7.9	25 mm wide Slip-resistant Carborandum inserts on ramp bonded with an approved adhesive	LM	75		
3.7.10	32 x 3mm thick plastic dividing strips	LM	516		
	Finishes to drain channels				
3.7.11	Terrazzo to floor as before described but to sloping sides and bed of channel	SM	70		
	Drainage Channel Covers				
3.7.12	550x200x100 mm thick cover fins reinforced with 4No. 12mm diameter mild steel reinforcement bar and 8mm diameter stirrups at 100mm centres, rebated, tongued and grooved to fit into drain channels including all necessary formwork, plaster to all internal surfaces and exposed external surfaces all as per Architect's details.	LM	52		
	Ceiling				
3.7.13	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	127		
3.7.14	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	127		
	TOTAL FOR ELEMENT NO. 3.6 (FINISHES) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 3.8 FITTINGS AND FIXTURES				
	75mm thick concrete (concrete class 25) to Toe kick in:				
3.8.1	Wash basin counters.	SM	7		
	Sawn Treated cypress formwork to: -				
3.8.2	Soffits of suspended slab	SM	7		
3.8.3	Edges to 75mm thick Toe Kicks 0-75mm thick	LM	11		
	FINISHES Counter Slabs				
3.8.4	20 mm Thick homogenous mix terrazzo laid on screed backing; cement sand marble chippings (1:4:8) grinded and polished including dividing strips.	SM	7		
3.8.5	Extra over for boxing to form opening for sinks to the top of washroom and kitchen counter slabs	NO	12		
	TOTAL FOR ELEMENT NO. 3.7 (FITTINGS AND FIXTURES) CARRIED TO SUMMARY BELOW				
	HATCHERY A BUILDING WORKS SUMMARY				
3.1	Total for Element No. 3.1 (Substructure Works), brought forward from page HABW/4				
3.2	Total for Element No. 3.2 (Superstructure Reinforced Concrete Works), brought forward from page HABW/5				
3.3	Total for Element No. 3.3 (Walling), brought forward from page HABW/5				
3.4	Total for Element No. 3.4 (Roofing) brought forward from page HABW/7				
3.5	Total for Element No. 3.5 (Windows) brought forward from page HABW/7				
3.6	Total for Element No. 3.6 (Doors) brought forward from page HABW/7				
3.7	Total for Element No. 3.7 (Finishes) brought forward from page HABW/8				
3.8	Total for Element No. 3.8 (Fittings and fixtures) brought forward from above				
	TOTAL FOR 1 NO. HATCHERY BUILDING WORKS				
	X2				
	TOTAL FOR 2 NO. HATCHERY BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 4; ALGAE PRODUCTION BUILDING WORKS ELEMENT NO 4.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

BILL OF QUANTITIES FOR PROPOSED ALGAE PRODUCTION AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
4.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	688		
4.1.2	Excavate oversite average 150mm deep and cart away	SM	688		
4.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	308		
4.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	152		
4.1.5	Extra over excavation from rock in any position	CM	460		
	Disposal of excavated material				
4.1.6	Return, fill and ram extra excavation materials around foundation	CM	263		
4.1.7	Load and cart away surplus material	CM	197		
	Disposal of Water				
4.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
4.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
4.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	206		
4.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	688		
	Insecticide Treatment				
4.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	688		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	BROUGHT FORWARD				
	CONCRETE WORKS				
4.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15)	SM	307		
	Vibrated reinforced concrete class 25/20 to:-				
4.1.14	Strip footing	CM	52		
4.1.15	Columns Bases	CM	41		
4.1.16	Foundation Columns	CM	6		
4.1.17	150 mm Thick ground floor slab	SM	688		
4.1.18	150mm Thick sloping ramp slab	SM	49		
4.1.19	Extra over ditto to forming or leaving 450mm wide shallow drainage channels , average 450mm deep 'U' channel in hardcore and floor slab including hand packing to sides of channel, 200mm thick concrete to sides and bed of channel including 50mm blinding and all necessary formwork and reinforcement, all to detail and approval	LM	52		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
4.1.20	Assorted bars	KG	14,850		
4.1.21	BRC mesh type A142	SM	737		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
4.1.22	Edges of strip footing	SM	171		
4.1.23	Ditto but to column bases	SM	114		
4.1.24	Ditto but to sides of foundation columns	SM	68		
4.1.25	Ditto but to edges of floor slab 150mm - 225mm thick	LM	105		
4.1.26	Ditto but to edges of Ramps 150mm - 225mm thick	LM	45		
	FOUNDATION WALLING				
4.1.27	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	411		
	WATERPROOFING				
4.1.28	1000 gauge polythene DPM	SM	737		
	PLINTH FINISHES				
4.1.29	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	86		
	Painting and Decoration				
4.1.30	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	86		
	TOTAL ELEMENT NO. 4.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 4.2				
	SUPERSTRUCTURE REINFORCED CONCRETE WORKS				
	Vibrated Reinforced Concrete Class - 25/20 to:-				
4.2.1	Ring beams	CM	18		
4.2.2	Columns	CM	13		
4.2.3	Concrete gutters	CM	14		
4.2.4	150 mm thick suspended slab	SM	127		
	High Tensile Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
4.2.5	Asorted bars	KG	9,608		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
4.2.6	Sides and soffits of Beams	SM	216		
4.2.7	Sides and soffits of gutters	SM	116		
4.2.8	Sides of columns	SM	173		
4.2.9	Soffits of suspended slab	SM	127		
4.2.10	Edges of slabs 75-150 mm high	LM	64		
	TOTAL FOR ELEMENT NO. 4.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 4.3				
	WALLING				
4.4.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course externally	SM	419		
4.4.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course internally.	SM	213		
4.4.1	Ditto but 200 mm thick parapet walling ditto	SM	70		
	Arches				
4.4.4	Extra over 200 mm for forming curved arches 1000 - 3000 mm diameter including all necessary materials.	NO	14		
	WATERPROOFING				
4.4.3	Hessian based bituminous felt damp proof course 200mm wide	LM	237		
	Precast concrete coping				
4.4.4	300 x 75 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	100		
4.4.5	Ditto 550 x 350mm pier cap ditto to columns	NO	20		
	Precast Concrete Louvre Block Walling				
4.4.6	200 mm thick approved precast concrete louvre block walling bedded and jointed in cement sand (1:3) mortar, reinforced with 25mm x 3mm thick hoop iron strip in every alternate course	SM	51		
	TOTAL FOR ELEMENT NO. 4.3 (WALLING), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 4.4 ROOFING STEEL TRUSSES				
	The following in trusses, girders and independednt members made of cold-rolled light gauge Steel Sections including grinding all welds smooth and painting with red oxide primer before delivery to site, then welded and bolted with gusset plates, head, nuts, washers and all other necessary fittings in accordance with the fabricators shop drawings to the Engineer's approval				
4.4.1	75 x 50 x 3mm Thick (5.42Kg/m) R.H.S external members welded to gusset plate	LM	687		
4.4.2	50 x 50 x 3mm Thick (4.43Kg/m) S.H.S struts and ties	LM	539		
4.4.3	177.8 x 50.8 x 2mm Thick (5.90Kg/m) Zed purlins welded to rafters	LM	468		
	Sundries				
4.4.4	200 x 100 x 8 mm mild steel base plates with 4 no. holes countersunk of diameter 18 mm for 16 mm diameter x 200 mm long bolts	NO.	30		
4.4.5	100 x 75 x 6 mm thick angle cleats 2 no. holes countersunk of diameter 14 mm for 12 mm diameter rag bolts; welded to truss rafter and bolted with 2no. M12 bolts to base plate.	NO.	120		
4.4.6	75 x 75 x 6 mm thick angle cleats 2 no. holes countersunk of diameter 14 mm for 12 mm diameter rag bolts; welded to truss rafter and bolted with 2no. M12 bolts to the Z - purlins	NO.	270		
4.4.7	16 mm diameter x 200 mm long bolts with head , nut and washers : fixed to concrete or masonry walls	NO.	120		
4.4.8	12 mm diameter x 100 mm long grade 4.6 bolts with head , nut and washers : fixed to truss members.	NO.	780		
	ROOF COVERING				
4.4.9	28 Gauge prepainted Corrugated aluminium roofing sheets fixed with and including bolts, nails, cups and washer on purlins and rafter sides as (high quality) or approved equivalent	SM	583		
4.4.10	Ditto but matching ridge caps and Valley Gutters	LM	26		
4.4.11	10,000Litres 2400mm x 2800mm. The tank has screwed connections for inlet, outlet, no overflow, 25mm medium pressure ball valve. A 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	1		
	FLAT ROOF FINISHES				
4.4.12	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	127		
4.4.13	Apply one coat bituminous primer to surface of screed.	SM	127		
4.4.14	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	127		
4.4.15	Ditto sides of wall 200mm high	LM	100		
4.4.16	50 x 50mm internal angle fillet	LM	100		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ROOFING CONTINUED…				
	BROUGHT FORWARD				
4.4.16	200 x 200 x 25mm thick high quality interlocking concrete tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	127		
4.4.17	Ditto sides of wall 200mm high	LM	100		
	Rainwater goods				
4.4.18	Extra over for running outlet	NO	10		
4.4.19	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	40		
4.4.20	Extra over for swan neck 1000mm long	NO	10		
4.4.21	Extra over for shoe 1000mm long	NO	10		
	TOTAL FOR ELEMENT NO. 4.4 (ROOFING) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 4.5 WINDOWS ALUMINIUM FRAMED GLAZED WINDOWS Supply, assemble and fix the following purpose made powder coated aluminium framed sliding windows to B.S 3987, 1984 from approved manufacturer(s) complete with mullions, transomes, railing and necessary intermediate reinforcement elements including all weather strips, rubber glazing strips,couplings, sliding rails bars, window cills and window boards; panes fixed with 6mm thick one way glass fixed with beadings.				
4.5.1	Overall size 1700mm x 1500mm high	N0	8		
4.5.2	Overall size 4100mm x 450mm high	N0	2		
	TOTAL FOR ELEMENT NO. 4.5 (WINDOWS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 4.6 DOORS Wrot Mvule, or equal and approved Hardwood				
4.6.1	50mm Thick(finished) framed double leaves swing door size 1,500 x 2400mm high comprising of 300mm high fanlight and two equal openable leaves; 150 x 45mm grooved top rails and stiles, 200 x 45mm grooved bottom and middle rails, 20mm thick panel infills all finished for painting (m.s)	NO	10		
4.6.2	Single leaf single swing door size 900mm x 2400mm high with 300mm high glazed fanlight	NO	6		
	FRAMES				
4.6.3	150 x 50mm once rebated frame with labour: plugged	LM	118		
4.6.4	45 x 38mm architrave	LM	118		
4.6.5	25mm diameter quadrant	LM	118		
	Suply and fix the following ironmongery all to 'industrial galvanised' or equal and approved specification				
4.6.6	100mm heavy duty brass butt hinges	PRS	39		
4.6.7	Three lever rebated door lock complete with furniture	NO	16		
4.6.8	Rubber door stop	NO	26		
4.6.9	Door closer hold open power 2/3 (with cover)	NO	16		
	Signage				
4.6.10	Supply and fix Stainless steel satin Rectangular signage size 150 x 75mm	NO	16		
	Glazing				
4.6.11	5mm clear sheet glass with putty and beadings to detail.	SM	6		
	TOTAL FOR ELEMENT NO. 4.6 (DOORS), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 4.7				
	FINISHES				
	External Wall Finishes				
4.7.1	15mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	489		
4.7.2	Prepare and apply 3 coats of first quality exterior silicone paint to plastered surfaces.	SM	489		
	Internal Wall Finishes				
4.7.3	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	592		
4.7.4	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	592		
	Wall Tiles				
4.7.5	150 x 150 x 6mm Thick White glazed ceramic wall tiles bedding and jointing in cement and sand (1:3) mortar and flush pointed with white cement:	SM	253		
	Floor Finishes				
	Cement and sand (1:4) screeding smooth trowelled				
4.7.6	32mm Thick floor screed to floor finihses	SM	627		
	Terrazzo paving				
4.7.7	20 mm Thick homogenous mix terrazzo laid on screed backing; cement sand marble chippings (1:4:8) grinded and polished including dividing strips.	SM	627		
4.7.8	Ditto but to 100 mm high skirting	LM	326		
4.7.9	25 mm wide Slip-resistant Carborandum inserts on ramp bonded with an approved adhesive	LM	75		
4.7.10	32 x 3mm thick plastic dividing strips	LM	516		
	Finishes to drain channels				
4.7.11	Terrazzo to floor as before described but to sloping sides and bed of channel	SM	70		
	Drainage Channel Covers				
4.7.12	550x200x100 mm thick cover fins reinforced with 4No. 12mm diameter mild steel reinforcement bar and 8mm diameter stirrups at 100mm centres, rebated, tongued and grooved to fit into drain channels including all necessary formwork, plaster to all internal surfaces and exposed external surfaces all as per Architect's details.	LM	52		
	Ceiling				
4.7.13	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	127		
4.7.14	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	127		
	TOTAL FOR ELEMENT NO. 4.7 (FINISHES) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 4.8 FITTINGS AND FIXTURES				
	75mm thick concrete (concrete class 25) to Toe kick in:				
4.8.1	Washrooms wash basin counters.	SM	7		
	Sawn Treated cypress formwork to: -				
4.8.2	Soffits of suspended slab	SM	7		
4.8.3	To Edges to 75mm thick Toe Kicks 0-75mm thick	LM	11		
	FINISHES				
	Counter Slabs				
4.8.4	20 mm Thick homogenous mix terrazzo laid on screed backing; cement sand marble chippings (1:4:8) grinded and polished including dividing strips.	SM	7		
4.8.5	Extra over for boxing to form opening for sinks to the top of washroom and kitchen counter granite slabs	NO	12		
	Toe kick				
4.8.6	50mm thick light Cement and Sand weight (1:4) screeding smooth trowelled	SM	7		
	Ceramic floor tiles				
4.8.7	Supply and fix 6 mm thick non-slip ceramic floor tiles on prepared backing including grouting and edge protectors where required; overall size 600mm x 600mm.	SM	7		
4.8.8	Ditto 100mm high skirting	LM	11		
	TOTAL FOR ELEMENT NO. 4.9 (FITTINGS AND FIXTURES) CARRIED TO SUMMARY BELOW				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ALGAE PRODUCTION BUILDING WORKS SUMMARY				
4.1	Total for Element No. 4.1 (Substructure Works), brought forward from page APBW/4				
4.2	Total for Element No. 4.2 (Superstructure Reinforced Concrete Works), brought forward from page APBW/5				
4.3	Total for Element No. 4.3 (Walling), brought forward from page APBW/5				
4.4	Total for Element No. 4.4 (Roofing) brought forward from page APBW/7				
4.5	Total for Element No. 4.5 (Windows) brought forward from page APBW/7				
4.6	Total for Element No. 4.6 (Doors) brought forward from page APBW/8				
4.7	Total for Element No. 4.7 (Finishes) brought forward from page APBW/9				
4.8	Total for Element No. 4.8 (Fittings and fixtures) brought forward from page APBW/9				
	TOTAL FOR ALGAE PRODUCTION BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 5; OFFICE AND WASHROOM BLOCK BUILDING WORKS ELEMENT NO 5.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

BILL OF QUANTITIES FOR PROPOSED HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
5.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	77		
5.1.2	Excavate oversite average 150mm deep and cart away	SM	77		
5.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	88		
5.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	34		
5.1.5	Extra over excavation from rock in any position	CM	122		
	Disposal of excavated material				
5.1.6	Return, fill and ram extra excavation materials around foundation	CM	75		
5.1.7	Load and cart away surplus material	CM	47		
	Disposal of Water				
5.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
5.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
5.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	24		
5.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	77		
	Insecticide Treatment				
5.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	77		
	CONCRETE WORKS				
5.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15)	SM	81		
	Vibrated reinforced concrete class 25/20 to:-				
5.1.14	Strip footing	CM	9		
5.1.15	Columns Bases	CM	9		
5.1.16	Foundation Columns	CM	2		
5.1.17	150 mm Thick ground Floor slab	SM	77		
5.1.18	Ramps	SM	4		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
5.1.19	Assorted bars	KG	3,120		
5.1.20	BRC mesh type A142	SM	77		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	BROUGHT FORWARD				
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
5.1.21	Edges of strip footing	SM	39		
5.1.22	Ditto but to column bases	SM	27		
5.1.23	Ditto but to sides of foundation columns	SM	21		
5.1.24	Ditto but to edges of floor slab 150mm - 225mm thick	LM	41		
5.1.25	Ditto but to edges of Ramps 150mm - 225mm thick	LM	5		
	FOUNDATION WALLING				
5.1.26	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	117		
	WATERPROOFING				
5.1.27	1000 gauge polythene DPM	SM	77		
	PLINTH FINISHES				
5.1.28	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	21		
	Painting and Decoration				
5.1.29	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	21		
	TOTAL ELEMENT NO. 5.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 5.2 SUPERSTRUCTURE REINFORCED CONCRETE WORKS Vibrated Reinforced Concrete Class - 25/20 to:-				
	Beams				
5.2.1	Suspended beams	CM	12		
5.2.2	Ring beams	CM	9		
5.2.3	Concrete gutters	CM	9		
	Columns				
5.2.4	Ground and first Floor Columns	CM	9		
	Slabs				
5.2.5	150 mm Thick suspended slab	SM	89		
	High Tensile Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
5.2.6	Asorted bars	KG	6,503		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
5.2.7	Sides of Beams	SM	273		
5.2.8	Sides and soffits of gutters	SM	113		
5.2.9	Sides of columns	SM	45		
5.2.10	To soffits of suspended slabs	SM	89		
5.2.11	To Edges of first floor slabs 150-225mm high	LM	42		
	TOTAL FOR ELEMENT NO. 5.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 5.3 WALLING				
5.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course externally	SM	173		
5.3.2	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course internally.	SM	30		
5.3.3	Ditto but 200 mm thick parapet walling ditto	SM	50		
	Arches				
5.3.4	Extra over 200 mm for forming curved arches 1000 - 3000 mm diameter including all necessary materials.	NO	9		
	Precast Concrete Louvre Block Walling				
5.3.5	200 mm thick approved precast concrete louvre block walling bedded and jointed in cement sand (1:3) mortar, reinforced with 25mm x 3mm thick hoop iron strip in every alternate course	SM	6		
	WATERPROOFING				
5.3.6	Hessian based bituminous felt damp proof course 200mm wide	LM	51		
	Precast concrete coping				
5.3.7	300 x 75 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	71		
5.3.8	Ditto 550 x 350mm pier cap ditto to columns	NO	10		
	TOTAL FOR ELEMENT NO. 5.3 (WALLING), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 5.4 ROOFING STEEL TRUSSES				
	The following in trusses, girders and independednt members made of cold-rolled light gauge Steel Sections including grinding all welds smooth and painting with red oxide primer before delivery to site, then welded and bolted with gusset plates, head, nuts, washers and all other necessary fittings in accordance with the fabricators shop drawings to the Engineer's approval				
5.4.1	75 x 50 x 3mm Thick (5.42Kg/m) R.H.S external members welded to gusset plate	LM	687		
5.4.2	50 x 50 x 3mm Thick (4.43Kg/m) S.H.S struts and ties	LM	539		
5.4.3	177.8 x 50.8 x 2mm Thick (5.90Kg/m) Zed purlins welded to rafters	LM	468		
	Sundries				
5.4.4	200 x 100 x 8 mm mild steel base plates with 4 no. holes countersunk of diameter 18 mm for 16 mm diameter x 200 mm long bolts	NO.	30		
5.4.5	100 x 75 x 6 mm thick angle cleats 2 no. holes countersunk of diameter 14 mm for 12 mm diameter rag bolts; welded to truss rafter and bolted with 2no. M12 bolts to base plate.	NO.	120		
5.4.6	75 x 75 x 6 mm thick angle cleats 2 no. holes countersunk of diameter 14 mm for 12 mm diameter rag bolts; welded to truss rafter and bolted with 2no. M12 bolts to the Z - purlins	NO.	270		
5.4.7	16 mm diameter x 200 mm long bolts with head , nut and washers : fixed to concrete or masonry walls	NO.	120		
5.4.8	12 mm diameter x 100 mm long grade 4.6 bolts with head , nut and washers : fixed to truss members.	NO.	780		
	ROOF COVERING				
5.4.9	28 Gauge prepainted Corrugated aluminium roofing sheets fixed with and including bolts, nails, cups and washer on purlins and rafter sides as (high quality) or approved equivalent	SM	468		
5.4.10	Ditto but matching ridge caps and Valley Gutters	LM	26		
	FLAT ROOF FINISHES				
5.4.11	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	89		
5.4.12	Apply one coat bituminous primer to surface of screed.	SM	89		
5.4.13	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	89		
5.4.14	Ditto sides of wall 200mm high	LM	71		
5.4.15	50 x 50mm internal angle fillet	LM	71		
5.4.16	200 x 200 x 25mm thick high quality interlocking concrete tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	89		
5.4.17	Ditto sides of wall 200mm high	LM	71		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ROOFING CONTINUED…				
	BROUGHT FORWARD				
	Rainwater goods				
5.4.18	Extra over for running outlet	NO	4		
5.4.19	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	16		
5.4.20	Extra over for swan neck 1000mm long	NO	4		
5.4.21	Extra over for shoe 1000mm long	NO	4		
	Supply and fix the following approved uPVC Cylindrical Water Storage Tanks, (Diameter x Ht).				
5.4.22	10,000Litres 2400mm x 2800mm. The tank has screwed connections for inlet, outlet, no overflow, 25mm medium pressure ball valve with 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	1		
	TOTAL FOR ELEMENT NO. 5.4 (ROOFING) CARRIED TO SUMMARY				
	ELEMENT NO. 5.5 WINDOWS ALUMINIUM FRAMED GLAZED WINDOWS				
	Supply, assemble and fix the following purpose made powder coated aluminium framed sliding windows to B.S 3987, 1984 from approved manufacturer(s) complete with mullions, transomes, railing and necessary intermediate reinforcement elements including all weather strips, rubber glazing strips,couplings, sliding rails bars, window cills and window boards; panes fixed with 6mm thick one way glass fixed with beadings.				
5.5.1	Overall size 1500mm x 1000mm high	N0	2		
5.5.2	Overall size 2000mm x 1000mm high	N0	3		
5.5.3	Overall size 1950mm x 2000mm high	N0	2		
5.5.4	Overall size 1200mm x 2000mm high	N0	1		
	TOTAL FOR ELEMENT NO. 5.5 (WINDOWS), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 5.6				
	DOORS				
	Wrot Mvule, or equal and approved Hardwood				
5.6.1	50mm Thick(finished) framed Single leaf single swing door size 900 x 2400mm high comprising of 300mm fanlight, 150 x 45mm grooved top rails and stiles, 200 x 45mm grooved bottom and middle rails, 20mm thick panel infills all finished for painting (m.s)	NO	2		
5.6.2	Ditto double swing door size 1000 x 2400 mm high	NO	4		
5.6.3	Ditto but door size 800 x 2100mm high ditto	NO	2		
	FRAMES				
5.6.4	150 x 50mm once rebated frame with labour: plugged	LM	51		
5.6.5	45 x 38mm architrave	LM	51		
5.6.6	25mm diameter quadrant	LM	51		
	Suply and fix the following ironmongery all to 'industrial galvanised' or equal and approved specification				
5.6.7	100mm heavy duty brass butt hinges	PRS	6		
5.6.8	Ditto but double action hinges.	PRS	6		
5.6.9	Three lever rebated door lock complete with furniture	NO	2		
5.6.10	Indicator bolt	NO	2		
5.6.11	Rubber door stop	NO	14		
5.6.12	Kick plate 900 x 450 x 2mm thick	NO	8		
5.6.13	Door closer hold open power 2/3 (with cover)	NO	9		
	Signage				
5.6.14	Supply and fix Stainless steel satin Rectangular signage to offices and washrooms size 150 x 75mm	NO	9		
	Glazing				
5.6.15	5mm clear sheet glass with putty and beadings to detail.	SM	2		
	TOTAL FOR ELEMENT NO. 5.6 (DOORS), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 5.7				
	FINISHES				
	External Wall Finishes				
5.7.1	15mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	273		
5.7.2	Prepare and apply 3 coats of first quality exterior silicone paint to plastered surfaces.	SM	273		
	Internal Wall Finishes				
5.7.3	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	105		
5.7.4	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	105		
	Wall Tiles				
5.7.5	150 x 150 x 6mm Thick White glazed ceramic wall tiles bedding and jointing in cement and sand (1:3) mortar and flush pointed with white cement:	SM	45		
	Floor Finishes				
	Cement and sand (1:4) screeding smooth trowelled				
5.7.6	32mm Thick floor screed to floor finihses	SM	74		
	Ceramic floor tiles				
5.7.7	Supply and fix 8 mm thick non-slip ceramic floor tiles on prepared backing including grouting and edge protectors where required.	SM	19		
5.7.8	Ditto 100mm high skirting	LM	19		
	Granito floor tiles				
5.7.9	Supply and fix 25mm thick polished granito floor tiles on prepared backing including grouting and edge protectors where required; overall size 600mm x 600mm.	SM	29		
5.7.10	Ditto 100mm high skirting	LM	31		
	Terrazzo paving				
5.7.11	20 mm Thick homogenous mix terrazzo laid on screed backing; cement sand marble chippings (1:4:8) grinded and polished including dividing strips.	SM	26		
5.7.12	Ditto but to 100 mm high skirting	LM	35		
5.7.13	25 mm wide Slip-resistant Carborandum inserts on ramp bonded with an approved adhesive	LM	8		
5.7.14	32 x 3mm thick plastic dividing strips	LM	34		
	Ceiling				
5.7.15	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	89		
5.7.16	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	89		
	Door finishes				
5.7.17	Prepare and apply three coats gloss paint (high-quality or equal approved) to general wood surfaces	SM	35		
5.7.18	Ditto girth 100-200mm	LM	51		
5.7.19	Ditto girth not exceeding 100mm	LM	102		
	TOTAL FOR ELEMENT NO. 5.7 (FINISHES) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 5.8 BALUSTRANDING AND RAILING Ramp Railing				
	Metal Work (All in Grade 316 Stainless Steel sections in 1,000 mm high railing complete with handrail saddles and brackets, balusters base covers, endcaps, spacer brackets and adapters, and all fixing accessories as necessary and to architect's details and approval)				
5.8.1	50 mm diameter x 3 mm thick CHS balusters spaced at 1,000 mm centres; one end grouted onto concrete other end welded to handrail (m/s).	LM	9		
5.8.2	50mm diameter x 3 mm thick CHS top rail welded to balusters (m/s)	LM	7		
5.8.3	25 mm Diameter x 1.5 mm thick CHS 4 No. intermediate rails.	LM	28		
	Sundries				
5.8.4	Make hole in concrete slab size 50 x 50 x 50mm deep	NO	8		
	TOTAL FOR ELEMENT NO. 5.8 (BALUSTRANDING AND RAILING) CARRIED TO SUMMARY				
	ELEMENT NO. 5.9 FITTINGS AND FIXTURES				
	75mm thick concrete (concrete class 15) to Toe kick in:				
5.9.1	Washrooms wash basin counters and Changing Room lockers.	SM	4		
	Sawn Treated cypress formwork to: -				
5.9.2	To Edges to 75mm thick Toe Kicks 0-75mm thick	LM	8		
	Supply and Fix:- 20mm thick Mahogany boards to:-				
5.9.3	Changing room lockers door shutters and partitions	SM	80		
	Ironmongery				
5.9.4	75mm pair hinges	PRS	52		
5.9.5	Cupboard door lock	NO	35		
5.9.6	Pull handle	NO	35		
5.9.7	Ball catch	NO	35		
5.9.8	Chromium plated hanging rail, diameter 25mm	LM	5		
5.9.9	Brackets to chromium plated hanging rail, diameter 25mm	NO	18		
	FINISHES Counter Slabs				
5.9.10	Supply and fix 20 mm thick counter granite slabs	SM	1		
5.9.11	Extra over for boxing to form opening for sinks to the top of washroom and kitchen counter granite slabs	NO	2		
	Toe kick				
5.9.12	50mm thick light Cement and Sand weight (1:4) screeding smooth trowelled	SM	4		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	FITTINGS AND FIXTURES CONTINUED				
	BROUGHT FORWARD				
	Ceramic floor tiles				
5.7.13	Supply and fix 6 mm thick non-slip ceramic floor tiles on prepared backing including grouting and edge protectors where required; overall size 600mm x 600mm.	SM	4		
5.9.14	Ditto 100mm high skirting	LM	8		
	Painting and Decoration				
5.9.15	Prepare and apply one primer coat and two coats of high quality wood paint or equal and approved to wood surfaces	SM	160		
	Ladder				
5.9.16	Supply and fix Heavy duty Powder coated aluminium access ladder with 300mm wide treads and protective cage complete with all necessary furniture to architect's details and specification	LM	8		
	TOTAL FOR ELEMENT NO. 3.9 (FITTINGS AND FIXTURES) CARRIED TO SUMMARY BELOW				
	WASHROOM BLOCK BUILDING WORKS SUMMARY				
5.1	Total for Element No. 5.1 (Substructure Works), brought forward from page WBW/4				
5.2	Total for Element No. 5.2 (Superstructure Reinforced Concrete Works), brought forward from page WBW/5				
5.3	Total for Element No. 5.3 (Walling), brought forward from page WBW/6				
5.4	Total for Element No. 5.4 (Roofing) brought forward from page WBW/8				
5.5	Total for Element No. 5.5 (Windows) brought forward from page WBW/8				
5.6	Total for Element No. 5.6 (Doors) brought forward from page WBW/9				
5.7	Total for Element No. 5.7 (Finishes) brought forward from page WBW/11				
5.8	Total for Element No. 5.8 (Balustrading and Railing) brought forward from page WBW/11				
5.9	Total for Element No. 5.9 (Fittings and fixtures) brought forward from page WBW/12				
	TOTAL FOR 1 NO. OFFICE AND WASHROOM BLOCK BUILDING WORKS, CARRIED TO GRAND SUMMARY				
	X3				
	TOTAL FOR 3 N0. OFFICE AND WASHROOM BLOCKS BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 6; POWER HOUSE BUILDING WORKS ELEMENT NO 6.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
6.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	161		
6.1.2	Excavate oversite average 150mm deep and cart away	SM	161		
6.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	165		
6.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	34		
6.1.5	Extra over excavation from rock in any position	CM	199		
	Disposal of excavated material				
6.1.6	Return, fill and ram extra excavation materials around foundation	CM	143		
6.1.7	Load and cart away surplus material	CM	56		
	Disposal of Water				
6.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
6.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
6.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	48.3		
6.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	161		
	Insecticide Treatment				
6.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	161		
	CONCRETE WORKS				
6.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15)	SM	133		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	BROUGHT FORWARD SUBSTRUCTURES CONTINUED				
	Vibrated reinforced concrete class 25/20 to:-				
6.1.14	Strip footing	CM	14		
6.1.15	Columns Bases	CM	7		
6.1.16	Foundation Columns	CM	1		
6.1.17	150 mm Thick ground floor slab	SM	161		
6.1.18	150 mm Thick Ramps	SM	6		
6.1.19	Extra over ditto to forming or leaving 400mm wide shallow Cable channels, average 450mm deep 'U' channel in hardcore and floor slab including hand packing to sides of channel, 150mm thick concrete to sides and bed of channel including 50mm blinding and all necessary formwork and reinforcement, all to detail and approval	LM	69		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
6.1.20	Assorted bars	KG	3435		
6.1.21	BRC mesh type A142	SM	161		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
6.1.22	Edges of strip footing	SM	55		
6.1.23	Ditto but to column bases	SM	27		
6.1.24	Ditto but to sides of foundation columns	SM	12		
6.1.25	Ditto but to edges of floor slab 150mm - 225mm thick	LM	54		
6.1.26	Ditto but to edges of Ramps 150mm - 225mm thick	LM	8		
	FOUNDATION WALLING				
6.1.27	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	132		
	WATERPROOFING				
6.1.28	1000 gauge polythene DPM	SM	161		
	PLINTH FINISHES				
6.1.29	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	27		
	Painting and Decoration				
6.1.30	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	27		
	TOTAL ELEMENT NO. 6.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 6.2 SUPERSTRUCTURE REINFORCED CONCRETE WORKS Vibrated Reinforced Concrete Class - 25/20 to:-				
6.2.1	Beams	CM	7		
6.2.2	Columns	CM	2		
6.2.3	Concrete gutters	CM	7		
6.2.4	200 mm Thick Suspended floor slab	SM	161		
	High Tensile Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
6.2.5	Asorted bars	KG	6266		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
6.2.6	Sides of Beams	SM	121		
6.2.7	Sides and soffits of gutters	SM	54		
6.2.8	Sides of columns	SM	24		
6.2.9	To soffits of suspended slabs	SM	161		
6.2.10	To Edges of first floor slabs 150-225mm high	LM	54		
	TOTAL FOR ELEMENT NO. 6.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 6.3 WALLING				
6.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course externally	SM	69		
6.3.2	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course internally.	SM	36		
6.3.3	Ditto but 200 mm thick parapet walling ditto	SM	31		
	Precast Concrete Louvre Block Walling				
6.3.4	200 mm thick approved precast concrete louvre block walling bedded and jointed in cement sand (1:3) mortar, reinforced with 25mm x 3mm thick hoop iron strip in every alternate course	SM	29		
	WATERPROOFING				
6.3.5	Hessian based bituminous felt damp proof course 200mm wide	LM	56		
	Precast concrete coping				
6.3.6	300 x 75 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	44		
6.3.7	Ditto 550 x 350mm pier cap ditto to columns	NO	10		
	TOTAL FOR ELEMENT NO. 6.3 (WALLING), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 6.4 ROOFING FLAT ROOF FINISHES				
6.4.1	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	161		
6.4.2	Apply one coat bituminous primer to surface of screed.	SM	161		
6.4.3	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	161		
6.4.4	Ditto sides of wall 200mm high	LM	54		
6.4.5	50 x 50mm internal angle fillet	LM	54		
6.4.6	200 x 200 x 25mm thick high quality concrete tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	161		
6.4.7	Ditto sides of wall 200mm high	LM	54		
	Rainwater goods				
6.4.8	Extra over for running outlet	NO	6		
6.4.9	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	20		
6.4.10	Extra over for swan neck 1000mm long	NO	6		
6.4.11	Extra over for shoe 1000mm long	NO	6		
	Supply and fix the following approved uPVC Cylindrical Water Storage Tanks, (Diameter x Ht).				
6.4.12	10,000Litres 2400mm x 2800mm. The tank has screwed connections for inlet, outlet, no overflow, 25mm medium pressure ball valve. A 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	1		
	TOTAL FOR ELEMENT NO. 6.4 (ROOFING) CARRIED TO SUMMARY				
	ELEMENT NO. 6.5 DOORS Sliding gates				
	Supply, assemble and fix the following Mild/Galvanized Steel sliding gate with louvre vents and all necessary furniture primed with red oxide and finished with three coats of approved first quality matt metal paint as per Archtect's details. The gate should be assembled and fixed to opening including cutting and pinning lugs to concrete or blockwork surround and bedding frame in cement and sand mortar (1:4). (Ref Architects Detailing)				
6.5.1	Overal size 2000mm x 2400mm high	NO	6		
	TOTAL FOR ELEMENT NO. 6.6 (DOORS), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 6.6 FINISHES External Wall Finishes				
6.6.1	15mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	131		
6.6.2	Prepare and apply 3 coats of first quality exterior silicone paint to plastered surfaces.	SM	131		
	Internal Wall Finishes				
6.6.3	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	203		
6.6.4	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	203		
	Floor Finishes Cement and sand (1:4) screeding smooth trowelled				
6.6.5	32mm Thick floor screed to floor finihses	SM	161		
	Paving slabs				
6.6.6	Supply and fix 50 mm thick precast concrete paving slabs size 600 x 600 mm bedded and pointed in cement and sand mortar.	SM	33		
	Ceiling				
6.6.7	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	161		
6.6.8	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	161		
	Finishes to Cable channels				
6.6.9	Screed finish to floor as before described but to sloping sides and bed of channel	SM	94		
	Cable Chanel Covers				
6.6.10	Supply and fix the 550mm wide prepainted mild steel grating cover to cable chanels as per architect's details	SM	38		
	TOTAL FOR ELEMENT NO. 6.7 (FINISHES) CARRIED TO SUMMARY BELOW				
	POWER HOUSE BUILDING WORKS SUMMARY				
6.1	Total for Element No. 6.1 (Substructure Works), brought forward from page PHBW/3				
6.2	Total for Element No. 6.2 (Superstructure Reinforced Concrete Works), brought forward from page PHBW/4				
6.3	Total for Element No. 6.3 (Walling), brought forward from page PHBW/4				
6.4	Total for Element No. 6.4 (Roofing) brought forward from page PHBW/5				
6.5	Total for Element No. 6.6 (Doors) brought forward from page PHBW/5				
6.6	Total for Element No. 6.7 (Finishes) brought forward from above				
	TOTAL FOR POWER HOUSE BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 7; REVERSE OSMOSIS ROOM BUILDING WORKS ELEMENT NO 7.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
7.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	57		
7.1.2	Excavate oversite average 150mm deep and cart away	SM	57		
7.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	92		
7.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	21		
7.1.5	Extra over excavation from rock in any position	CM	113		
	Disposal of excavated material				
7.1.6	Return, fill and ram extra excavation materials around foundation	CM	79		
7.1.7	Load and cart away surplus material	CM	34		
	Disposal of Water				
7.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
7.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
7.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	18		
7.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	57		
	Insecticide Treatment				
7.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	57		
	TOTAL EXCAVATION AND EARTHWORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	CONCRETE WORKS				
7.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15)	SM	51		
	Vibrated reinforced concrete class 25/20 to:-				
7.1.14	Strip footing	CM	10		
7.1.15	Columns Bases	CM	6		
7.1.16	Foundation Columns	CM	1.0		
7.1.17	150 mm Thick ground floor slab	SM	57.0		
7.1.18	Extra over ditto to forming or leaving 400mm wide shallow Cable channels, average 450mm deep 'U' channel in hardcore and floor slab including hand packing to sides of channel, 150mm thick concrete to sides and bed of channel including 50mm blinding and all necessary formwork and reinforcement, all to detail and approval	LM	10		
	High Tensile Ribbed Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
7.1.19	Assorted bars	KG	2,550		
7.1.20	BRC mesh type A142	SM	57		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
7.1.23	Edges of strip footing	SM	25		
7.1.24	Ditto but to column bases	SM	15		
7.1.25	Ditto but to sides of foundation columns	SM	8		
7.1.26	Ditto but to edges of floor slab 150mm - 225mm thick	LM	32		
	FOUNDATION WALLING				
7.1.29	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	74		
	WATERPROOFING				
7.1.30	1000 gauge polythene DPM	SM	57		
	PLINTH FINISHES				
7.1.31	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	16		
	Painting and Decoration				
7.1.32	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	16		
	TOTAL SUBSTRUCTURE WALLING AND CONCRETE WORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 6.1 (SUBSTRUCTURE WORKS) COLLECTION				
A	Total Excavation and Earthworks brought forward from page ROBW/2				
B	Total Substructure Walling and Concrete Works brought forward from page ROBW/3				
	TOTAL ELEMENT NO. 7.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 7.2 SUPERSTRUCTURE REINFORCED CONCRETE WORKS Vibrated Reinforced Concrete Class - 25/20 to:-				
7.2.1	Beams	CM	4		
7.2.2	Concrete gutters	CM	4		
7.2.3	Columns	CM	2		
7.2.4	150 mm Thick Suspended floor slab	SM	55		
	High Tensile Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
7.2.5	Asorted bars	KG	2,738		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
7.2.6	Sides of Beams	SM	24		
7.2.7	Sides and soffits of gutters	SM	49		
7.2.8	Sides of columns	SM	20		
7.2.9	To soffits of suspended slabs	SM	55		
7.2.10	To Edges of first floor slabs 150-225mm high	LM	31		
	TOTAL FOR ELEMENT NO. 7.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 7.3 WALLING				
7.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course (internally and externally)	SM	59		
	WATERPROOFING				
7.3.2	Hessian based bituminous felt damp proof course 200mm wide	LM	26		
	Precast concrete coping				
7.3.3	300 x 50 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	31		
7.3.4	Ditto 550 x 350mm pier cap ditto to columns	NO	6		
	Precast Louvred Concrete Blocks Walling				
7.3.5	200mm thick Precast louvered concrete blocks joint together with cement:sand mortor (1:3) and make good	SM	15		
	TOTAL FOR ELEMENT NO. 7.3 (WALLING), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 7.4 ROOFING				
	FLAT ROOF FINISHES				
7.4.1	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	55		
7.4.2	Apply one coat bituminous primer to surface of screed.	SM	55		
7.4.3	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	55		
7.4.4	Ditto sides of wall 200mm high	LM	31		
7.4.5	50 x 50mm internal angle fillet	LM	31		
7.4.6	200 x 200 x 25mm thick high quality clay tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	55		
7.4.7	Ditto sides of wall 200mm high	LM	31		
	Rainwater goods				
7.4.8	Extra over for running outlet	NO	4		
7.4.9	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	13		
7.4.10	Extra over for swan neck 1000mm long	NO	4		
7.4.11	Extra over for shoe 1000mm long	NO	4		
	Supply and fix the following approved uPVC Cylindrical Water Storage Tanks, (Diameter x Ht).				
7.4.12	10,000Litres 2400mm x 2800mm. The tank has screwed connections for inlet, outlet, no overflow, 25mm medium pressure ball valve. A 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	1		
	TOTAL FOR ELEMENT NO. 7.4 (ROOFING) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 7.5 DOORS Sliding gates Supply, assemble and fix the following Mild/Galvanized Steel sliding gate with louvre vents and all necessary furniture primed with red oxide and finished with three coats of approved first quality matt metal paint as per Archtect's details. The gate should be assembled and fixed to opening including cutting and pinning lugs to concrete or blockwork surround and bedding frame in cement and sand mortar (1:4). (Ref Architects Detailing)				
7.5.1	Overal size 2500mm x 2400mm high	NO	2		
	TOTAL FOR ELEMENT NO. 7.5 (DOORS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 7.6 FINISHES Wall and Concrete Finishes				
7.6.1	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	118		
7.6.2	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	118		
	Floor Finishes Cement and sand (1:4) screeding smooth trowelled				
7.6.3	32mm Thick floor screed	SM	57		
	Paving slabs				
7.6.4	Supply and fix 50 mm thick precast concrete paving slabs size 600 x 600 mm bedded and pointed in cement and sand mortar.	SM	20		
	Ceiling				
7.6.5	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	57		
7.6.6	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	57		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BROUGHT FORWARD FROM PAGE ROBW/7				
	FINISHES CONTINUED...				
	Finishes to Cable channels				
7.6.7	Terrazzo to floor as before described but to sloping sides and bed of channel	SM	13		
	Cable Chanel Covers				
7.6.8	Supply and fix the 550mm wide prepainted mild steel grating cover to cable chanels as per architect's details	SM	5		
	TOTAL FOR ELEMENT NO. 7.6 (FINISHES) CARRIED TO SUMMARY BELOW				
	REVERSE OSMOSIS ROOM BUILDING WORKS SUMMARY				
7.1	Total for Element No. 7.1 (Substructure Works), brought forward from page ROBW/4				
7.2	Total for Element No. 7.2 (Superstructure Reinforced Concrete Works), brought forward from page ROBW/5				
7.3	Total for Element No. 7.3 (Walling), brought forward from page ROBW/5				
7.4	Total for Element No. 7.4 (Roofing) brought forward from page ROBW/6				
7.5	Total for Element No. 7.6 (Doors) brought forward from page ROBW/7				
7.6	Total for Element No. 7.7 (Finishes) brought forward from above				
	TOTAL FOR REVERSE OSMOSIS ROOM BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 8; PUMP ROOM BUILDING WORKS ELEMENT NO 8.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
8.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	20		
8.1.2	Excavate oversite average 150mm deep and cart away	SM	20		
8.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	28		
8.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	14		
8.1.5	Extra over excavation from rock in any position	CM	42		
8.1.6	Disposal of excavated material Return, fill and ram extra excavation materials around foundation	CM	24		
8.1.7	Load and cart away surplus material	CM	18		
8.1.8	Disposal of Water Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
8.1.9	Planking and strutting Allow for planking and strutting sides of excavation	Item	1		
8.1.10	Filling 300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	6		
8.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	20		
8.1.12	Insecticide Treatment Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	20		
	TOTAL EXCAVATION AND EARTHWORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	CONCRETE WORKS				
8.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15/20)	SM	28		
	Vibrated reinforced concrete class 25/20 to:-				
8.1.14	Strip footing	CM	4		
8.1.15	Columns Bases	CM	4		
8.1.16	Foundation Columns	CM	1		
8.1.17	150 mm thick ground floor slab	SM	20		
8.1.18	Extra over ditto to forming or leaving 400mm wide shallow Cable channels, average 450mm deep 'U' channel in hardcore and floor slab including hand packing to sides of channel, 150mm thick concrete to sides and bed of channel including 50mm blinding and all necessary formwork and reinforcement, all to detail and approval	LM	7		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
8.1.19	Assorted bars	KG	1,350		
8.1.20	BRC mesh type A142	SM	20		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
8.1.21	Sides of strip footing	SM	16		
8.1.22	Ditto but to column bases	SM	10		
8.1.23	Ditto but to sides of foundation columns	SM	5		
8.1.24	Ditto but to edges of floor slab 150mm - 225mm thick	LM	18		
	FOUNDATION WALLING				
8.1.25	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	39		
	WATERPROOFING				
8.1.26	1000 gauge polythene DPM	SM	20		
	PLINTH FINISHES				
8.1.27	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	9		
	Painting and Decoration				
8.1.28	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	9		
	TOTAL SUBSTRUCTURE WALLING AND CONCRETE WORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 6.1 (SUBSTRUCTURE WORKS) COLLECTION				
A	Total Excavation and Earthworks brought forward from page PRBW/2				
B	Total Substructure Walling and Concrete Works brought forward from page PRBW/3				
	TOTAL ELEMENT NO. 8.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 8.2 SUPERSTRUCTURE REINFORCED CONCRETE WORKS Vibrated Reinforced Concrete Class - 25/20 to:-				
8.2.1	Beams	CM	2		
8.2.2	Columns	CM	2		
8.2.3	150 mm Thick Suspended floor slab	SM	20		
	High Tensile Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
8.2.4	Asorted bars	KG	1,200		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
8.2.5	Sides of Beams	SM	14		
8.2.6	Sides of columns	SM	15		
8.2.7	To soffits of suspended slabs	SM	20		
8.2.8	To Edges of first floor slabs 150-225mm high	LM	18		
	TOTAL FOR ELEMENT NO. 8.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 8.3 WALLING				
8.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course (internally and externally)	SM	24		
	WATERPROOFING				
8.3.2	Hessian based bituminous felt damp proof course 200mm wide	LM	36		
	Precast concrete coping				
8.3.3	300 x 50 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	18		
8.3.4	Ditto 550 x 350mm pier cap ditto to columns	NO	4		
	Precast Louvred Concrete Blocks Walling				
8.3.5	200mm thick Precast louvered concrete blocks joint together with cement:sand mortor (1:3) and make good	SM	9		
	TOTAL FOR ELEMENT NO. 8.3 (WALLING), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 8.4 ROOFING				
	FLAT ROOF FINISHES				
8.4.1	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	20		
8.4.2	Apply one coat bituminous primer to surface of screed.	SM	20		
8.4.3	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	20		
8.4.4	Ditto sides of wall 200mm high	LM	18		
8.4.5	50 x 50mm internal angle fillet	LM	18		
8.4.6	200 x 200 x 25mm thick high quality clay tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	20		
8.4.7	Ditto sides of wall 200mm high	LM	18		
	Rainwater goods				
8.4.8	Extra over for running outlet	NO	4		
8.4.9	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	13		
8.4.10	Extra over for swan neck 1000mm long	NO	4		
8.4.11	Extra over for shoe 1000mm long	NO	4		
	Supply and fix the following approved uPVC Cylindrical Water Storage Tanks, (Diameter x Ht).				
8.4.12	10,000Litres 2400mm x 2800mm. The tank has screwed connections for inlet, outlet, no overflow, 25mm medium pressure ball valve. A 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	1		
	TOTAL FOR ELEMENT NO. 8.4 (ROOFING) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 8.5 DOORS Sliding gates Supply, assemble and fix the following Mild/Galvanized Steel sliding gate with louvre vents and all necessary furniture primed with red oxide and finished with three coats of approved first quality matt metal paint as per Archtect's details. The gate should be assembled and fixed to opening including cutting and pinning lugs to concrete or blockwork surround and bedding frame in cement and sand mortar (1:4). (Ref Architects Detailing)				
8.5.1	Overal size 1500mm x 3000mm high	NO	1		
	TOTAL FOR ELEMENT NO. 8.5 (DOORS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 8.6 FINISHES Wall and Concrete Finishes				
8.6.1	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	48		
8.6.2	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	48		
	Floor Finishes Cement and sand (1:4) screeding smooth trowelled				
8.6.3	32mm Thick floor screed Paving slabs	SM	20		
8.6.4	Supply and fix 50 mm thick precast concrete paving slabs size 600 x 600 mm bedded and pointed in cement and sand mortar.	SM	11		
	Ceiling				
8.6.5	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	20		
8.6.6	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	20		
	TOTAL FOR ELEMENT NO. 8.6 (FINISHES) CARRIED TO SUMMARY BELOW				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	PUMP ROOM BUILDING WORKS SUMMARY				
8.1	Total for Element No. 8.1 (Substructure Works), brought forward from page PRBW/4				
8.2	Total for Element No. 8.2 (Superstructure Reinforced Concrete Works), brought forward from page PRBW/5				
8.3	Total for Element No. 8.3 (Walling), brought forward from page PRBW/5				
8.4	Total for Element No. 8.4 (Roofing) brought forward from page PRBW/6				
8.5	Total for Element No. 8.5 (Doors) brought forward from page PRBW/7				
8.6	Total for Element No. 8.6 (Finishes) brought forward from above				
	TOTAL FOR PUMP ROOM BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 9; STORAGE TANKS BUILDING WORKS ELEMENT NO 9.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
9.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	192		
9.1.2	Excavate oversite average 150mm deep and cart away	SM	192		
9.1.3	Bulk excavation oversite to reduce levels depth n.e. 1.5 M deep starting from existing ground level	CM	288		
9.1.4	Ditto but for Manhole Chamber: not exceeding 1.5m deep	CM	3		
9.1.5	Extra over excavation from rock in any position	CM	291		
	Disposal of excavated material				
9.1.6	Return, fill and ram extra excavation materials around foundation	CM	168		
9.1.7	Load and cart away surplus material	CM	123		
	Disposal of Water				
9.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
9.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
9.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	58		
9.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	192		
	Insecticide Treatment				
9.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	192		
	TOTAL EXCAVATION AND EARTHWORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	CONCRETE WORKS				
9.1.13	100mm thick concrete blinding to surfaces of tank base and Manhole chamber base slabs (concrete class 15/20)	SM	196		
	Vibrated reinforced concrete class 25/20 to:-				
9.1.14	350mm thick base slab	CM	68		
9.1.15	350mm thick Manhole chamber base slab	CM	1		
9.1.16	350mm thick Tank wall	CM	51		
9.1.17	Ditto but manhole chamber wall	CM	1		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
9.1.18	Assorted bars	KG	18150		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
9.1.19	Sides of Tank base slab	SM	18		
9.1.20	Ditto but to Manhole chamber base slab	SM	3		
9.1.21	Ditto but to Tank wall curved on plan.	SM	290		
9.1.22	Sides of Manhole Chamber wall	SM	13		
9.1.23	Extra over for boxing to form opening for Incoming 100mm dia water pipe	NO	1		
	WATER BAR				
9.1.24	200mm x 15mm thick PVC Water bar set vertically in concrete wall at construction or expansion joint to engineer's approval	LM	49		
	Construction Joint				
9.1.25	25 x 25mm sealer	LM	49		
	WATERPROOFING				
9.1.26	1000 gauge polythene DPM	SM	196		
	WATERPROOFING				
9.1.27	Hessian based bituminous felt damp proof course 200mm wide	LM	56		
	Approved waterproofing treatment to concrete surfaces applied strictly to manufacturer's instructions to:				
9.1.28	Base slabs	SM	196		
9.1.29	Walls	SM	303		
	TOTAL SUBSTRUCTURE WALLING AND CONCRETE WORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 9.1 (SUBSTRUCTURE WORKS) COLLECTION				
A	Total Excavation and Earthworks brought forward from page STBW/2				
B	Total Substructure Walling and Concrete Works brought forward from page STBW/3				
	TOTAL ELEMENT NO. 9.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY BELOW				
	SUPERSTRUCTURES ELEMENT NO. 9.2 FINISHES				
	Waterproofed cement and sand (1:4) backings etc				
9.2.1	42mm thick cement sand screed 1:3 on Base slabs	SM	196		
9.2.2	25mm thick render to sides of Tank and Chamber Walls	SM	303		
	TOTAL FOR ELEMENT NO. 9.2 (FINISHES) CARRIED TO SUMMARY BELOW				
	STORAGE TANKS BUILDING WORKS SUMMARY				
9.1	Total for Element No. 9.1 (Substructure Works), brought forward from above				
9.2	Total for Element No. 9.2 (Finishes) brought forward from above				
	TOTAL FOR 1 NO. STORAGE TANK BUILDING WORKS				
	X2				
	TOTAL FOR 2 NO. STORAGE TANKS BUILDING WORKS CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 10; TRIAL TANKS BUILDING WORKS ELEMENT NO 10.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
10.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	256		
10.1.2	Excavate oversite average 150mm deep and cart away	SM	256		
10.1.3	Bulk excavation oversite to reduce levels depth n.e. 1.5 M deep starting from existing ground level	CM	384		
10.1.4	Ditto but for manhole: not exceeding 1.5m deep	CM	3		
10.1.5	Extra over excavation from rock in any position	CM	387		
	Disposal of excavated material				
10.1.6	Return, fill and ram extra excavation materials around foundation	CM	227		
10.1.7	Load and cart away surplus material	CM	160		
	Disposal of Water				
10.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
10.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
10.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	77		
10.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	256		
	Insecticide Treatment				
10.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	256		
	TOTAL EXCAVATION AND EARTHWORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	CONCRETE WORKS				
10.1.13	100mm thick concrete blinding to surfaces of tank base and Manhole chamber base slabs (concrete class 15/20)	SM	256		
	Vibrated reinforced concrete class 25/20 to:-				
10.1.14	350mm thick base slab	CM	90		
10.1.15	Ditto Manhole chamber base slab	CM	1		
10.1.16	350mm thick Tank wall	CM	56.0		
10.1.17	Ditto but manhole chamber wall	CM	3.0		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
10.1.18	Assorted bars	KG	22,500		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
10.1.19	Sides of Tank base slab	SM	22		
10.1.20	Ditto but to Manhole chamber base slab	SM	3		
10.1.21	Ditto but to Tank wall	SM	320		
10.1.22	Sides of Manhole Chamber wall	SM	12		
10.1.23	Extra over for boxing to form opening for Incoming 100mm dia water pipe	NO	1		
	WATER BAR				
10.1.24	200mm x 15mm thick PVC Water bar set vertically in concrete wall at construction or expansion joint to engineer's approval	LM	69		
	Construction Joint				
10.1.25	25 x 25mm sealer	LM	69		
	WATERPROOFING				
10.1.26	1000 gauge polythene DPM	SM	256		
	WATERPROOFING				
10.1.27	Hessian based bituminous felt damp proof course 200mm wide	LM	64		
	Approved waterproofing treatment to concrete surfaces applied strictly to manufacturer's instructions to:				
10.1.28	Base slabs	SM	256		
10.1.29	Walls	SM	332		
	TOTAL SUBSTRUCTURE WALLING AND CONCRETE WORKS, CARRIED FORWARD TO ELEMENT COLLECTION				
	ELEMENT NO. 10.1 (SUBSTRUCTURE WORKS) COLLECTION				
A	Total Excavation and Earthworks brought forward from page TTBW/2				
B	Total Substructure Walling and Concrete Works brought forward from page TTBW/3				
	TOTAL ELEMENT NO. 10.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO 10.2 FINISHES				
	Waterproofed cement and sand (1:4) backings etc				
10.2.1	42mm thick cement sand screed 1:3 on Base slabs	SM	256		
10.2.2	25mm thick render to sides of Tank and Chamber Walls	SM	332		
	TOTAL FOR ELEMENT NO. 10.2 (FINISHES) CARRIED TO SUMMARY BELOW				
	TRIAL TANKS BUILDING WORKS SUMMARY				
10.1	Total for Element No. 10.1 (Substructure Works), brought forward from page TTBW/4				
10.2	Total for Element No. 10.2 (Finishes) brought forward from page TTBW/5				
	TOTAL FOR 1 NO. TRIAL TANKS BUILDING WORKS				
	X2				
	TOTAL FOR 2 NO. TRIAL TANKS BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 11; WETLAND BUILDING WORKS ELEMENT NO 11.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
11.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	716		
11.1.2	Excavate oversite average 150mm deep and cart away	SM	716		
11.1.3	Bulk excavation oversite to reduce levels depth n.e. 1.5 M deep starting from existing ground level	CM	1074		
11.1.4	Ditto but for Manhole Chamber: not exceeding 1.5m deep	CM	3		
11.1.5	Extra over excavation from rock in any position	CM	1077		
	Disposal of excavated material				
11.1.6	Return, fill and ram extra excavation materials around foundation	CM	754		
11.1.7	Load and cart away surplus material	CM	323		
	Disposal of Water				
11.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
11.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
11.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	215		
11.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	716		
	Insecticide Treatment				
11.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	716		
	TOTAL EXCAVATION AND EARTHWORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	CONCRETE WORKS				
11.1.13	100mm thick concrete blinding to surfaces of tank base and Manhole chamber base slabs (concrete class 15/20)	SM	720		
	Vibrated reinforced concrete class 25/20 to:-				
11.1.14	350mm thick base slab	CM	251		
11.1.15	350mm thick Manhole chamber base slab	CM	1		
11.1.16	350mm thick Tank wall	CM	60		
11.1.17	300mm thick internal Tank walls	CM	105		
11.1.18	Ditto but manhole chamber wall	CM	3		
	High Tensile Ribbed Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
11.1.19	Assorted bars	KG	63000		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
11.1.20	Sides of Tank base slab	SM	33		
11.1.21	Ditto but to Manhole chamber base slab	LM	3		
11.1.22	Ditto but to Tank walls.	SM	1033		
11.1.23	Sides of Manhole Chamber wall	SM	13		
11.1.24	Extra over for boxing to form opening for Incoming 100mm dia water pipe	NO	1		
	WATER BAR				
11.1.25	200mm x 15mm thick PVC Water bar set vertically in concrete wall at construction or expansion joint to engineer's approval	LM	92		
	Construction Joint				
11.1.26	25 x 25mm sealer	LM	92		
	WATERPROOFING				
11.1.27	1000 gauge polythene DPM	SM	720		
	WATERPROOFING				
11.1.28	Hessian based bituminous felt damp proof course 200mm wide	LM	98		
	Approved waterproofing treatment to concrete surfaces applied strictly to manufacturer's instructions to:				
11.1.29	Base slabs	SM	720		
11.1.30	Walls	SM	1046		
	TOTAL SUBSTRUCTURE WALLING AND CONCRETE WORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 11.1 (SUBSTRUCTURE WORKS) COLLECTION				
A	Total Excavation and Earthworks brought forward from page WLBW/2				
B	Total Substructure Walling and Concrete Works brought forward from page WLBW/3				
	TOTAL ELEMENT NO. 11.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY BELOW				
	SUPERSTRUCTURES ELEMENT NO. 11.2 FINISHES Waterproofed cement and sand (1:4) backings etc				
11.2.1	42mm thick cement sand screed 1:3 on Base slabs	SM	720		
11.2.2	25mm thick render to sides of Tank and Chamber Walls	SM	1046		
11.2.3	Supply and application of Manure. Supply and apply prime quality fertilizers or compost manure at designated locations and as directed by the landscape architect or Project Manager	SM	716		
11.2.4	Supply and Installation of Grass and Lawns Supply, plant, water, weed and tend well undermentioned algae to wetland untill fully established / to reasonable maturity. This should be carried out one to two weeks after installation Algae springs spaced at 100mm centres both ways	SM	720		
	TOTAL FOR ELEMENT NO. 11.2 (FINISHES) CARRIED TO SUMMARY BELOW				
	WETLAND BUILDING WORKS SUMMARY				
11.1	Total for Element No. 11.1 (Substructure Works), brought forward from above				
11.2	Total for Element No. 11.2 (Finishes) brought forward from above				
	TOTAL FOR WETLAND BUILDING WORKS CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 12; BATTERY ROOM BUILDING WORKS ELEMENT NO 12.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
12.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	84		
12.1.2	Excavate oversite average 150mm deep and cart away	SM	84		
12.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	118		
12.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	21		
12.1.5	Extra over excavation from rock in any position	CM	139		
	Disposal of excavated material				
12.1.6	Return, fill and ram extra excavation materials around foundation	CM	98		
12.1.7	Load and cart away surplus material	CM	41		
	Disposal of Water				
12.1.8	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
12.1.9	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
12.1.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	26		
12.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	84		
	Insecticide Treatment				
12.1.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	84		
	TOTAL EXCAVATION AND EARTHWORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	CONCRETE WORKS				
12.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15/20)	SM	61		
	Vibrated reinforced concrete class 25/20 to:-				
12.1.14	Strip footing	CM	12		
12.1.15	Columns Bases	CM	6		
12.1.16	Foundation Columns	CM	1.0		
12.1.17	150 mm Thick ground floor slab	SM	84.0		
12.1.18	Extra over ditto to forming or leaving 400mm wide shallow Cable channels, average 450mm deep 'U' channel in hardcore and floor slab including hand packing to sides of channel, 150mm thick concrete to sides and bed of channel including 50mm blinding and all necessary formwork and reinforcement, all to detail and approval	LM	10		
	High Tensile Ribbed Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
12.1.19	Assorted bars	KG	2,850		
12.1.20	BRC mesh type A142	SM	84		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
12.1.23	Edges of strip footing	SM	32		
12.1.24	Ditto but to column bases	SM	15		
12.1.25	Ditto but to sides of foundation columns	SM	9		
12.1.26	Ditto but to edges of floor slab 150mm - 225mm thick	LM	38		
	FOUNDATION WALLING				
12.1.29	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	94		
	WATERPROOFING				
12.1.30	1000 gauge polythene DPM	SM	84		
	PLINTH FINISHES				
12.1.31	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	19		
	Painting and Decoration				
12.1.32	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	19		
	TOTAL SUBSTRUCTURE WALLING AND CONCRETE WORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 12.1 (SUBSTRUCTURE WORKS) COLLECTION				
A	Total Excavation and Earthworks brought forward from page BRBW/2				
B	Total Substructure Walling and Concrete Works brought forward from page BRBW/3				
	TOTAL ELEMENT NO. 12.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 12.2 SUPERSTRUCTURE REINFORCED CONCRETE WORKS Vibrated Reinforced Concrete Class - 25/20 to:-				
12.2.1	Beams	CM	5		
12.2.2	Concrete gutters	CM	4		
12.2.3	Columns	CM	2		
12.2.4	150 mm Thick Suspended floor slab	SM	84		
	High Tensile Reinforcement Bars to B. S. 4461 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
12.2.5	Asorted bars	KG	3,540		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
12.2.6	Sides of Beams	SM	30		
12.2.7	Sides and soffits of gutters	SM	52		
12.2.8	Sides of columns	SM	20		
12.2.9	To soffits of suspended slabs	SM	84		
12.2.10	To Edges of first floor slabs 150-225mm high	LM	38		
	TOTAL FOR ELEMENT NO. 12.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 12.3 WALLING				
12.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course (internally and externally)	SM	73		
	WATERPROOFING				
12.3.2	Hessian based bituminous felt damp proof course 200mm wide	LM	26		
	Precast concrete coping				
12.3.3	300 x 50 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	38		
12.3.4	Ditto 550 x 350mm pier cap ditto to columns	NO	6		
	Precast Louvred Concrete Blocks Walling				
12.3.5	200mm thick Precast louvered concrete blocks joint together with cement:sand mortor (1:3) and make good	SM	22		
	TOTAL FOR ELEMENT NO. 12.3 (WALLING), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 12.4 ROOFING				
	FLAT ROOF FINISHES				
12.4.1	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	84		
12.4.2	Apply one coat bituminous primer to surface of screed.	SM	84		
12.4.3	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	84		
12.4.4	Ditto sides of wall 200mm high	LM	38		
12.4.5	50 x 50mm internal angle fillet	LM	38		
12.4.6	200 x 200 x 25mm thick high quality clay tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	84		
12.4.7	Ditto sides of wall 200mm high	LM	38		
	Rainwater goods				
12.4.8	Extra over for running outlet	NO	4		
12.4.9	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	13		
12.4.10	Extra over for swan neck 1000mm long	NO	4		
12.4.11	Extra over for shoe 1000mm long	NO	4		
	Supply and fix the following approved uPVC Cylindrical Water Storage Tanks, (Diameter x Ht).				
12.4.12	10,000Litres 2400mm x 2800mm. The tank has screwed connections for inlet, outlet, no overflow, 25mm medium pressure ball valve. A 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	1		
	TOTAL FOR ELEMENT NO. 12.4 (ROOFING) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 12.5 DOORS Sliding gates Supply, assemble and fix the following Mild/Galvanized Steel sliding gate with louvre vents and all necessary furniture primed with red oxide and finished with three coats of approved first quality matt metal paint as per Archtect's details. The gate should be assembled and fixed to opening including cutting and pinning lugs to concrete or blockwork surround and bedding frame in cement and sand mortar (1:4). (Ref Architects Detailing)				
12.5.1	Overal size 2500mm x 2400mm high	NO	2		
	TOTAL FOR ELEMENT NO. 12.5 (DOORS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 12.6 FINISHES Wall and Concrete Finishes				
12.6.1	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	146		
12.6.2	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	146		
	Floor Finishes Cement and sand (1:4) screeding smooth trowelled				
12.6.3	32mm Thick floor screed	SM	84		
	Paving slabs				
12.6.4	Supply and fix 50 mm thick precast concrete paving slabs size 600 x 600 mm bedded and pointed in cement and sand mortar.	SM	23		
	Ceiling				
12.6.5	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	84		
12.6.6	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	84		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BROUGHT FORWARD FROM PAGE BRBW/7				
	FINISHES CONTINUED...				
	Finishes to Cable channels				
12.6.7	Terrazzo to floor as before described but to sloping sides and bed of channel	SM	13		
	Cable Chanel Covers				
12.6.8	Supply and fix the 550mm wide prepainted mild steel grating cover to cable chanels as per architect's details	SM	5		
	TOTAL FOR ELEMENT NO. 12.6 (FINISHES) CARRIED TO SUMMARY BELOW				
	REVERSE OSMOSIS ROOM BUILDING WORKS SUMMARY				
12.1	Total for Element No. 12.1 (Substructure Works), brought forward from page BRBW/4				
12.2	Total for Element No. 12.2 (Superstructure Reinforced Concrete Works), brought forward from page BRBW/5				
12.3	Total for Element No. 12.3 (Walling), brought forward from page BRBW/5				
12.4	Total for Element No. 12.4 (Roofing) brought forward from page BRBW/6				
12.5	Total for Element No. 12.6 (Doors) brought forward from page BRBW/7				
12.6	Total for Element No. 12.7 (Finishes) brought forward from above				
	TOTAL FOR BATTERY ROOM BUILDING WORKS, CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive)				
	BILL NO. 13; 3 NO ABLUTION BLOCKS MECHANICAL WORKS				
	ELEMENT NO. 13.1 (INTERNAL PLUMBING):				
	Supply, deliver and install pipes, tubing and fiitings as described and shown on the drawings. The pipes shall be PN 25PPR pipes where exposed to adverse weather conditions and all conforming to the current European standards for PPR installations and to the Engineers Approval. Pipe jointing shall be by polyfusion or use electric coupling, Rates must allow for all metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints support raceways, isolating sheaths, elastic materials, expansion arms and bends cross overs, couplings, clippings, connectors, joints etc. as required in the running legths of pipe work and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system. The pipes will be pressure tested before the plastering of wall commences and as per the manufactures recommended testing pressures				
	PPR Pipes				
13.1.1	20mm diameter pipework in wall chase	LM	100		
13.1.2	25mm Ditto	LM	250		
13.1.3	32mm Ditto	LM	300		
	Sockets;				
13.1.4	20mm diameter socket	NO	15		
13.1.5	25mm ditto	NO	40		
13.1.6	32mm Ditto	LM	30		
	Bends				
13.1.7	20mm diameter bends	NO	15		
13.1.8	25mm ditto	NO	90		
13.1.9	32mm Ditto	NO	45		
	Tees				
13.1.10	20mm diameter equal tees	NO	9		
13.1.11	25mm ditto	NO	60		
13.1.12	32mm Ditto	NO	30		
	Reducers				
13.1.13	25x20mm Reducer	NO	78		
13.1.14	32x25mm ditto	NO	27		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	Threaded Fittings				
13.1.15	20mm diameter male/female threaded 90° bend/Elbow	NO	90		
13.1.16	25mm diameter PPR-M Adapter	NO	40		
13.1.17	32mm diameter ditto	NO	36		
	Nipples				
13.1.18	20mm diameter G.I. nipple	NO	22		
13.1.19	25mm ditto	NO	36		
	Water Storage Tank				
13.1.20	Supply, deliver and install Rectangular close end plastic moulded tank of capacity **1,000 litres.** The tank to be assembled complete with cover and having screwed connections fo inlet, outlet, overflow, 20mm high pressure ball valve, drain pipes and any other item necessary for its proper functioning. The tank shall be approved by the Engineer	NO	11		
	Valves				
13.1.21	20mm diameter approvded medium pressure screw down full way non-rising stem wedge gate valve to BS 5154 PN 20 for series B rating,with wheel and head jopints to steel tubing and complete with round male threaded transion fittings.	NO	11		
13.1.22	25mm ditto	NO	20		
	TOTAL FOR ELEMENT NO. 13.1 (INTERNAL PLUMBING) CARRIED FORWARD TO BILL NO. 13 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 13.2:				
	SANITARY FITTINGS:				
	Supply,deliver,install,test and commission the following sanitary appliances complete with all the accessories including all connections to the services,waste,jointing to water supply,overflows,supports and all plugging and screwing to walls and floors.				
	Note.				
	(i). All sanitary fittings shall be in approved colour.				
	(ii). The model and Ref. No. Indicated is only a guide to the type and quality of fittings.				
	(iii). Equivalent and Approved models may be acceptable				
	Flexible Tubing				
13.2.1	15mm diameter x 300mm longg flexible connectors complete with Integral chrome plated angle valve for connecting the Sanitary fitting to water supply.	NO	32		
	Robe Hook				
13.2.2	Robe hook in vitreous china mounted to concealed screw to wall wedges.	NO	18		
	Close Couple Water Closet Suite				
13.2.3	Close Couple water closet suite in approved colour comprising of W.C. bowl,'p'or's' trap connector,heavy duty matching plastic seat and cover with metal top fixed to (crome plated) hinges and secured to floor or wall and complete with horizontal outlet to BS 3402 with 9 litre valveless Ceramic cistern and fittings including siphon,15mm diameter side inlet ball valves,20mm diameter side overflow,plastic flush bend,inlet connection,and chrome-plated lever.	NO	12		
	Urinal Set				
13.2.4	Urinal system comprising of approved 2No. Ceramic urinal bowls and 3 No. division complete with domed waste fitting, concealed Push Button-Type Brass Urinal Flush Valve for 1/2" and any otheraccessories for proper functioning of the set	SET	3		
	Counter top wash hand basin				
13.2.5	Wash Hand Basin 470mm by 470mm by 170mm counter top with one tap hole and chain stay hole,32 mm diameter chrome-plated pop up chain waste and fittings, approved first quality plastic bottle trap(32mm bottle trap) with 75mm seal.The basin to be supplied and installed complete with 15mm diameter heavy duty chrome plated -Brass Basin Tap	NO	8		
	Toilet Roll Holder				
13.2.6	9" Jumbo tissue dispenser in approved Plastic in approved colour.	NO	24		
	Mirrors				
13.2.7	610 X 610 X 6mm thick polished plate silver backed with beveled edges mirror fixed with clear silicon to 100 x 25mm thick wrot mahogany molded framing in 4 labors plugged to wall using 4No. Wall plugs with 75mm long stainless steel screws, painted in three coats polyurethane varnish all to approval	NO	14		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	<u>Soap Dispenser</u>				
13.2.8	Wall mounted soap dispenser with a capacity of about 1.5 Litre and having a press action soap release mechanism complete with fixing screws.including allowing for initial soap supply.The soap dispenser shall be size125x100x290mm high.	NO	14		
	<u>Bib Tap</u>				
13.2.9	15mm diameter heavy duty bib tap mounted 600mm off the finished floor level	NO	46		
	<u>Hand Drier</u>				
13.2.10	Automatic Hand Drier in approved colour operating on infra-red automatic sensing system with heating element,safety cut-out comlete with a 30-seconds safety timer,plastic rawl plugs and fixing screws.The hand drier to have a heating capacity of 3.1Kw and performance flow rate of 3.82 Litres/Min and to be of size270x264x143mm deep.It shall have anoise level of below72.5dBA at 1.5m.	NO	6		
	<u>Disabled persons Water Closet and Wash Hand Basin Facility</u>				
13.2.11	Wheel chair accessible W.C facility Comprising of the following:- **(i)**Close coupled W.C with 7.5 litre cistern with bottom inlet and overflow.The bowl shall e of size 375 x 560 x 420mm high.The bowl and cistern shall be manufactured from vitreous china complying with B.S 3402.The unit shall be complete with valveless cistern fitting including syphon,15mm side inlet ball valve,20mm diameter side overflow,plastic flush bend,inlet connector and reversible metallic chrome plated cistern lever.There shall also be a heavy duty seat(25mm high) and cover with chrome plated metal hinges,toilet roll holder,900 x 450 x 6mm thick mirror and Robe hook **(ii)**Semi-recessed wall mounted W.H.B of size 600 x 500 x 545mm high with flexible connectors to water taps.The basin shall be manufactured from vitreous china complying with B.S 3402.It shall have one L/H tap hole with 15mm chrome plated lever action pillar tap,chrome plated waste,first quality bottle trap,pedestal and wall fixing bolts. **(iii)**Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminium and mounted on a wall fixing plate size 230x100mm,4No. 600mm grab rails with covered wall plates.The Disabled set shall be wheelchair accessible W.C facility.	SET	6		
13.2.12	Arabic Shattaf Bidet spray c/w tube and head and fixing to wall.	NO	18		
	TOTAL FOR ELEMENT NO. 13.2 (SANITARY FITTINGS) CARRIED FORWARD TO BILL NO. 13 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 13.3:				
	FOUL DRAINAGE:				
	Supply,deliver and install the following UpVC,MUpVC,soil and waste systems,respectively to B.S 5255 with fittings fixed Key Terrain High Grade Golden Brown and Grey UPVC soil and waste pipe and jointing in accordance with manufacture's printed instructions and manufactured by reputable manufacturers.Tenderers must allow in their pipework prices for all the couplings,clippingsconnectors,joints,e.t.c as required in the running lengths of pipework and also where necessary,for pipe fixing clips,holder bats plugged and screwed for the proper and satisfactory functioning of the system				
	Internal;				
13.3.1	40mm diameter Grey UPVC waste pipe in wall chase.	LM	54		
13.3.2	50mm ditto but boxed in concrete floor slab	LM	90		
	Extra Ovetubing For;-				
13.3.3	100x50mm diameter UPVC floor trap,grating and cover	NO	30		
13.3.4	100mm diameter WC connector	NO	18		
	External;;				
13.3.5	100mm diameter Grey UPVC soil vent pipe with expansion coupling and fixing to wall with holder bats ducts	LM	18		
13.3.6	100mm diametere Golden Brown Heavy duty UPVC waste pipe in soil	LM	204		
13.3.7	160mm ditto	LM	102		
	Extra Overtubing For;-				
13.3.8	40mm diameter access tee and cap	NO	12		
13.3.9	50mm ditto	NO	18		
13.3.10	100mm diameter Inspection bend and Access cap.	NO	12		
13.3.11	100mm diameter vent cowl	NO	7		
13.3.12	100mm diameter weathering Slate and Apron	NO	7		
13.3.13	100mm diameter medium duty UPVC gulley trap,grating cover and waste	NO	20		
	TOTAL FOR ELEMENT NO. 13.3 (FOUL DRAINAGE) CARRIED FORWARD TO BILL NO. 13 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 13.4:				
	STERILIZATION AND TESTING:				
13.4.1	Allow for sterilization and flushing out of entire cold water installation with chlorine to the Engineer's Satisfaction	SUM	1		
13.4.2	Ditto for setting to work and testing the whole of the plumbing and drainage installation works both during progress and at completion to the satisfaction of the Engineer's satisfaction and to leave the whole installation in good working condition	SUM	1		
	TOTAL FOR ELEMENT NO. 13.4 (TESTING) CARRIED FORWARD TO BILL NO. 13 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 13.5:				
	BUILDER'S WORK IN CONNECTION WITH PLUMBING AND DRAINAGE				
	Masonry Gulley Trap				
13.5.1	Construct masonry gulley trap size 200x200mm, approx depth 300mm, complete with seal and concrete cover, including all disposal and form work	NO	20		
	Manholes and Covers				
13.5.2	Construct Manholes size 600 x 450mm and averaging 750mm deep constrructed in 100mm thick concrete base(1:3:6), approved 150mm block sides rendered all around in cement and sand (1:4).It shall have an approved heavy duty cast iron cover and frame as manufactured by E.A Foundry works,Including all necessary excavations,disposal and form work.	NO	20		
	Excavations				
13.5.3	Excavate trench not exceeding 1.5m deep, average depth 600mm for laying of drain pipes as earlier described, part back fill, part load and cart away remainder	LM	306		
	Chasing				
13.5.4	Form chase in both 100mm and 200mm thick coral block wall to receive necessary pipe work and make good disturbed areas	LM	150		
	Holes				
13.5.5	Make a hole through 100mm thick coral block wall for small pipe and make good disturbed areas	NO	35		
13.5.6	Ditto but 200mm thick and for large	NO	18		
	TOTAL FOR ELEMENT NO. 13.5 (BUILDER'S WORK IN CONNECTION WITH PLUMBING AND DRAINAGE) CARRIED FORWARD TO BILL NO. 13 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 13.6:				
	WATER RETICULATION:				
	Excavations				
13.6.1	Excavate trench in soil/murram for Water Mains supply pipe not exceeding 1200mm deep ,lay pipe,part return in,fill ram and surplus cart away	LM	300		
	Pipe Work				
13.6.2	32mm diameter (PN-20) PPR Riser	LM	24		
13.6.3	32mm diameter (PN-20) PPR Pipe on roof terrace	LM	24		
13.6.4	63mm HDPE (PN 20) pipe in excavated trench	LM	300		
	Extra Overtubing for:				
	Sockets;				
13.6.5	32mm diameter PPR Sockets	NO	13		
13.6.6	63mm ditto but HDPE (PN 20)	NO	76		
	Bends				
13.6.7	32mm diameter bend/Elbow	NO	15		
13.6.8	63mm ditto but HDPE (PN 20)	NO	10		
	Tees				
13.6.9	63mm diameter HDPE (PN 20) equal tee	NO	2		
	Reducers				
13.6.10	63x32mm HDPE (PN 20) reducer	NO	3		
	Threaded Fittings				
13.6.11	32mm diameter PPR-M Adapter	NO	6		
13.6.12	63mm ditto but HDPE (PN 20)	NO	4		
	Nipples;				
13.6.13	25mm diameter G.I. nipple	NO	6		
13.6.14	50mm ditto	NO	4		
	Valves				
13.6.15	25mm diameter heavy duty full Way gate valve as approved by the Engineer	NO	4		
13.6.16	50mm ditto	NO	8		
	Inspection Valve Chamber				
13.6.17	Construct Water Mains Valve Inspection Chamber size 225 x 225 x 500mm with 100mm concrete block rendered all round in cement (1:4) including hinged iron cover and frame in grease.	NO	4		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
13.6.18	<u>Meter Connection;</u> Allow for 25mm diameter Meter Connection from the Local Water Authority as 'KENT' or other equal and approvedincluding paying for all the necessary charges,if any	ITEM	1		
13.6.20	<u>Testing</u> Allow for connecting the above earlier described Booster pumps to the pump delivery and suction lines including Test Pumping and testing the whole of the water Reticulation system both during progress and at commissioning to the Engineer's satisfaction and to leave the system in and good sound working condition	ITEM	1		
13.6.21	<u>Surface Mounted Water Storage Tanks R.O.</u> Supply, deliver and install vertical close end plastic moulded water storage tank of capacity **24,000 litres** and **(size 3220mm diameterx3400mm high)**. The tank to be assembled complete with cover and having screwed connections fo inlet, outlet, overflow, 32mm high pressure ball valve, drain pipes and any other item necessary for its proper functioning.. The tank shall be installed on a reinforced flat surface platform base approx. 900mm high (M/S). R.O	ITEM	2		
13.6.22	<u>Surface Mounted Water Storage Tanks R.O.</u> Supply, deliver and install vertical close end plastic moulded water storage tank of capacity **10,000 litres** and **(size 2500mm diameterx2300mm high)**. The tank to be assembled complete with cover and having screwed connections for inlet, outlet, overflow, 32mm high pressure ball valve, drain pipes and any other item necessary for its proper functioning.. The tank shall be installed on a reinforced flat surface platform base approx. 3000mm high (M/S).	ITEM	1		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	SUPPLY, DELIVER, INSTALL, TEST AND COMMISSION THE FOLLOWING 10M^3 / HR REVERSE OSMOSIS DESALINATION UNIT TO POSITION SHOWN IN THE CONTRACT DRAWINGS AND AS INSTRUCTED BY THE MECHANICAL ENGINEER				
	REVERSE OSMOSIS PLANT				
13.6.23	Desalination unit capable of delivering **5000 Litres per Hour at 12 bars** pure water (quality to comply with ISO 23500-3:2019, maximum conductivty 5μs/cm @27oC, minimum Ionic Rejection 96%, minimum Bacterial and particles rejection 99%) consisting of Replaceable sedimentation Coarse filters, Activated carbon filters, Water softeners(Ion Exchange Unit) with regeneration salt, Fine filters(5 Microns), Replaceable Micro filter, RO system with Replaceable Membrane type and pump, UV treatment with Replaceable lamps, LCD display of conductivity and resistivity, Monitoring and safety devices(Audio and Visual Alarm on water quality, water level, system failure, system shut down), 5000Litres Clean water Reservoir tank/heat disinfection unit, Circulation/booster pump and accessories (Pressure 2Bars), high grade pipes capable of maintaining high microbiological quality in the system including all other accessories for proper functioning of the entire unit. Power Requirements 415V, A/c 50 Hz, Three phase, Ambient temperature 10° C to 40° C, Relative humidity 40% to 90%. The rate includes training of 2No. staff on how to operate and maintenance for a period of 1 year by the sub contractor.	ITEM	1		
13.6.24	Testing Allow for mechanical & Electrical connecting the above earlier described Reverse Osmosis Plant and testing the whole of the water Reticulation system both during progress and at commissioning to the Engineer's satisfaction and to leave the system in and good sound working condition	ITEM	1		
	TOTAL FOR ELEMENT NO. 13.6 (WATER RETICULATION) CARRIED FORWARD TO BILL NO. 13 SUMMARY PAGE BELOW				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BILL NO. 13; (3 NO ABLUTION BLOCKS MECHANICAL WORKS) SUMMARY PAGE :-				
13.1	INTERNAL PLUMBING BROUGHT FORWARD FROM MW/3				
13.2	SANITARY FITTINGS BROUGHT FORWARD FROM MW/6				
13.3	FOUL DRAINAGE BROUGHT FORWARD FROM MW/8				
13.4	TESTING BROUGHT FORWARD FROM MW/9				
13.5	BUILDERS WORK BROUGHT FORWARD FROM MW/10				
13.6	WATER RETICULATION BROUGHT FORWARD FROM ABOVE				
	TOTAL FOR BILL NO. 13; (3 NO ABLUTION BLOCKS MECHANICAL WORKS) CARRIED FORWARD TO MECHANICAL WORKS MAIN SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BILL NO. 14; - HATCHERY BLOCKS MECHANICAL WORKS				
	ELEMENT NO. 14.1 - Recirculating Aquaculture System:				
	Supply, deliver and install pipes, tubing and fiitings as described and shown on the drawings. The pipes shall be UPVC PN 20 Pressure pipes where exposed to adverse weather conditions and all conforming to the current European standards for UPVC installations and to the Engineers Approval. Pipe jointing shall be by polyfusion or use electric coupling, Rates must allow for all metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints support raceways, isolating sheaths, elastic materials, expansion arms and bends cross overs, couplings, clippings, connectors, joints etc. as required in the running legths of pipe work and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system. The pipes will be pressure tested before the plastering of wall commences and as per the manufactures recommended testing pressures				
	UPVC (PN 20) Pressure Pipes				
14.1.1	20mm diameter pipework	LM	42		
14.1.2	25mm Ditto	LM	126		
14.1.3	32mm Ditto	LM	240		
14.1.4	40mm Ditto	LM	114		
14.1.5	50mm Ditto	LM	850		
14.1.6	63mm Ditto	LM	276		
14.1.7	75mm Ditto	LM	60		
14.1.8	100mm Ditto	LM	200		
14.1.9	150mm Ditto	LM	1400		
	Sockets;				
14.1.9	20mm diameter UPVC socket	NO	8		
14.1.10	25mm ditto	NO	22		
14.1.11	32mm Ditto	NO	41		
14.1.12	40mm Ditto		20		
14.1.13	50mm Ditto	NO	149		
14.1.14	63mm Ditto		47		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
14.1.15	75mm Ditto	No.	11		
14.1.16	100mm Ditto	No.	118		
14.1.17	150mm Ditto	No.	118		
	Bends;				
14.1.17	20mm diameter high pressure UPVC bend	No.	42		
14.1.18	25mm ditto	No.	38		
14.1.19	32mm Ditto	No.	223		
14.1.20	40mm Ditto	No.	65		
14.1.21	50mm Ditto	No.	183		
14.1.22	63mm Ditto	No.	38		
14.1.23	75mm Ditto	No.	5		
14.1.24	100mm Ditto	No.	23		
14.1.25	150mm Ditto	No.	40		
	Tees;				
14.1.26	20mm diameter high pressure UPVC tee	NO	33		
14.1.27	25mm ditto	NO	22		
14.1.28	32mm Ditto	LM	64		
14.1.29	40mm Ditto	LM	28		
14.1.30	50mm Ditto	LM	135		
14.1.31	63mm Ditto	LM	32		
14.1.32	100mm Ditto	LM	140		
	Reducers;				
14.1.33	25 x 20mm diameter high pressure UPVC tee	No.	9		
14.1.34	32 x 25mm Ditto	No.	2		
14.1.35	40 x 25mm Ditto	No.	8		
14.1.36	40 x 32mm Ditto	No.	6		
14.1.37	50 x 32mm Ditto	No.	12		
14.1.38	63 x 32mm Ditto	No.	12		
14.1.39	63 x 40mm Ditto	No.	10		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
14.1.40	63 x 50mm Ditto	No.	13		
14.1.41	75 x 50mm Ditto	No.	6		
14.1.42	100 x 25mm Ditto	No.	8		
14.1.43	100 x 32mm Ditto	No.	52		
14.1.44	100 x 40mm Ditto	No.	32		
	Reducers continued;				
14.1.45	100 x 50mm Ditto	LM	77		
14.1.46	100 x 63mm Ditto	LM	3		
14.1.47	100 x 75mm Ditto	LM	2		
	Threaded Fittings				
14.1.48	20mm diameter male/female threaded 90° bend/Elbow	NO	42		
14.1.49	20mm diameter high pressure Upvc union	NO	26		
14.1.50	25mm ditto	NO	35		
14.1.51	32mm Ditto	LM	42		
14.1.52	40mm Ditto	LM	48		
14.1.53	50mm Ditto	LM	56		
14.1.54	63mm Ditto	LM	18		
14.1.55	100mm Ditto	LM	33		
	Sea Water Storage Tank				
14.1.56	Supply, deliver and install plastic moulded tank of capacity **10,000 litres** and **(size 3220mm diameterx3400mm high).** The tank to be assembled complete with cover and having screwed connections fo inlet, outlet, overflow, 20mm high pressure ball valve, drain pipes and any other item necessary for its proper functioning. The tank shall be approved by the Engineer	NO	6		
	Valves				
14.1.57	150mm diameter high pressure upvc PN 20 ball valve to approval.	NO	20		
14.1.58	100mm diameter high pressure upvc PN 20 ball valve to approval.	NO	40		
14.1.59	32mm Ditto	NO	51		
14.1.60	40mm Ditto	NO	62		
14.1.61	50mm Ditto	NO	85		
14.1.62	75mm Ditto	NO	5		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	UV DISINFECTION UNIT				
14.1.63	The UV disinfection unit shall consist of a high-efficiency UV lamp housed in a corrosion-resistant, watertight chamber. The unit shall be designed to effectively eliminate pathogens, bacteria, and other microorganisms present in the water as it circulates through the RAS system. Key specifications include:UV Lamp Type: Low-pressure, high-intensity UV lamp with 87 watt output.UV Transmittance (UVT): The unit shall be capable of accommodating water with varying levels of UVT to ensure effective disinfection.Flow Rate: The unit shall be sized to accommodate the system's maximum flow rate of $30m^3$/hr.Chamber Material: The UV chamber shall be constructed from durable, UV-resistant material suitable for long-term immersion in water.Control System: The unit shall include an integrated control system with automatic monitoring and alarms for UV lamp status and system performance.Safety Features: Safety interlocks and alarms shall be provided to ensure safe operation, and the unit shall comply with all applicable safety standards and regulations.	ITEM	5		
	Testing				
14.1.64	Allow for connecting the above earlier described UV Disinfection Unit and testing the whole of the Recirculating Aquaculture System both during progress and at commissioning to the Engineer's satisfaction and to leave the system in and good sound working condition	ITEM	1		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	SUPPLY, DELIVER, INSTALL, TEST AND COMMISSION THE FOLLOWING COMPACT SKID FILTRATION SYSTEM UNIT TO POSITION SHOWN IN THE CONTRACT DRAWINGS AND AS INSTRUCTED BY THE MECHANICAL ENGINEER				
14.1.65	Fully assembled and hydro tested energy efficient compact skid filtration and self-contained system of capacity 20m^3/hr compact unit nominal flow, manufactured in-house from Polypropylene plastic, offering robust fabrication, appropriate for heavy duty use and made to operate in saline and humidity conditions.The Skid Systems shall be equipped with: High Performance built-in Protein Fractionator/ Skimmer and sludge auto wash system,Degasification Bio tower/Trickle Filter Bioreactor, Moving Bed Bioreactor, Multipurpose media canister – suitable for Active Carbon, Phosphate Absorption Media Bio-pellets, Ultraviolet Disinfection System, Ozone Generator System, Water Level Sensors with alarm, mechanical Flow sensors through all built in systems, Basic Functions Button Console, Venturi Pump, Feed Pump, IP64 Fuse Box, Steel 316 Bolts and Nuts including all other necessary items for proper functioning of the unit . Additionally, a set of operation and maintenance manuals, technical data sheets, and certification documents is provided.	ITEM	5		
14.1.66	Testing Allow for connecting the above earlier described Compact Skid Filtration Unit and testing the whole of the Recirculating Aquaculture System both during progress and at commissioning to the Engineer's satisfaction and to leave the system in and good sound working condition	ITEM	1		
	SWIMMING POOL PUMP				
14.1.67	Swimming Pool Pump Sets (2 No.) mounted on a common Stainless steel base Frame to approval comprising of, One pump duty, One pump stand by, and each of capacity **50m3/hr** against a Maximum Head of **30metres**. The pump sets shall be complete with control panel, MCBS, Pressure and Float switches, Overload protection, ON/OFF Buttons, Indicator Lights, Non -Return, 50mm diameter Foot valve with Strainer, Gate valves, suction lines (50mm dia internal diameter PPR PN 20) and a Pressure Vessel of Approx Capacity **300Litres** including all other accessories for proper fuctioning. The pumps shall be connected in that when the Running Duty pump fails the Standby Pump starts up automatically.	ITEM	1		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
14.1.68	Testing Allow for connecting the above earlier described Booster pumps to the pump delivery and suction lines including Test Pumping and testing the whole of the Recirculating Aquaculture System both during progress and at commissioning to the Engineer's satisfaction and to leave the system in and good sound working condition	ITEM	1		
14.1.69	SEA WATER INTAKE PUMP Horizontally Mounted End Suction PISO (Preesure In, Suction Out) Centrifugal Type Sea water intake Pump Sets mounted on a common Stainless steel 316 base Frame to approval comprising of **2**No. pumps Operating on Duty- Stand- by Mode with **AISI 316 body** - impeller and shaft in **AISI 316L** steinless steel fused with 3 phase motors whose shaft power matches the pump flow rate to approval, designed for the challenging conditions of seawater intake. Each pump shall have a flow rate capacity of 20m3/hr against a head pressure of 30 meters. All pump components in contact with seawater shall be constructed from Stainless Steel. Additional components shall include:- Suction and discharge **150mm diameter HDPE piping approx 1300m** long with appropriate fittings, Strainers or screens to prevent debris and marine life from entering the pumping system, An electrical control panel with necessary switches, indicators, and safety features. The pump to be operated both on site and at the hatchery- which is approx 800m away from the site- i.e to have a remote and local control panel	ITEM	1		
14.1.70	Testing Allow for connecting the above earlier described Booster pumps to the pump delivery and suction lines including Test Pumping and testing the whole of the Recirculating Aquaculture System both during progress and at commissioning to the Engineer's satisfaction and to leave the system in and good sound working condition	ITEM	1		
	Aquaculture Tanks **Supply, deliver and install, test and commission the following aquaculture tanks into positions indicated in the mechanical drawings and as instructed by the Engineer.**				
14.1.71	10,000 Litres cylindrical broodstock tanks manufactured using food grade UV stabilised high density polyethene/fibre reinforced plastic. The tank shall be supplied complete with sight windows, net holders, central drain, swirl separator, heavy duty factory supplied supports and other accessories for proper functioning of the tank. A 500mm thick x 3000mm dia R.C tank base should be constructed on which the tank will be mounted.	NO	4		
14.1.72	5000 Litres ditto but rearing tanks ditto	NO	8		
14.1.73	2000 Litres ditto but rearing tanks ditto	NO	24		
14.1.74	1000 Litres ditto but rearing tanks ditto	NO	14		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
14.1.75	600 Litres ditto but hatch tanks ditto	NO	16		
14.1.76	500 Litres ditto but rotifer tanks ditto	NO	8		
14.1.77	500 Litres ditto but artemia tanks ditto	NO	8		
	MECHANICAL FILTERS				
14.1.78	Allow for installation of reusable Mechanical filters at the sea water intake point as approved by the Engineer	SUM	1		
14.1.79	Allow for Digital monitoring of the entire system software running on a local server (to be included in this rate) running on SCADA to monitir the following parameters Water Quality, PH, Conductivity of the water, Turbidity, Temperature, level, power parameters. The system shall have capabilities of controlling and operating all electrical equipment in the hatchary remotely as well as monitoring the system	SUM	1		
	TOTAL FOR ELEMENT NO. 14.1 (RECIRCULATING AQUACULTURE SYSTEM) CARRIED FORWARD TO BILL NO. 14 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 14.2 (ROOT BLOWER SYSTEM):				
	Supply, deliver and install pipes, tubing and fiitings as described and shown on the drawings. The pipes shall be PN 20 HPDE pipes where exposed to adverse weather conditions and all conforming to the current European standards for PPR installations and to the Engineers Approval. Pipe jointing shall be by polyfusion or use electric coupling, Rates must allow for all metal/plastic threaded adaptors where required for the connection of sanitary fixtures, valves, sockets, sliding and fixed joints support raceways, isolating sheaths, elastic materials, expansion arms and bends cross overs, couplings, clippings, connectors, joints etc. as required in the running legths of pipe work and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system. The pipes will be pressure tested before the plastering of wall commences and as per the manufactures recommended testing pressures				
	Pipes				
14.2.1	50mm diameter pipework suspended on tie beam and clipped 1 meter apart.	LM	200		
14.2.2	6mm diameter ditto but transparent flexible polyurethane pipe.	LM	284		
	Sockets;				
14.2.3	50mm diameter socket	NO	51		
	Bends				
14.2.4	20mm diameter bends	NO	12		
	Tees				
14.2.5	20mm diameter equal tees	NO	90		
	Reducers				
14.2.6	50 x 10mm Reducer	NO	90		
14.2.7	10 x 6mm Reducer	NO	90		
	Threaded Fittings				
14.2.8	10mm diameter PPR-M Adapter	NO	180		
	Valves				
14.2.9	10mm diameter high pressure upvc PN 20 ball valve to approval.	NO	90		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	ROOT BLOWER PUMP				
14.2.10	Double Stage Ring Blower Pump Sets (2 No.) mounted on a common Stainless steel base Frame to approval comprising of, One pump duty, One pump stand by, and each of capacity **150m3/hr** against a Maximum pressure psi of **4.06**. The pump sets shall be complete with control panel, MCBS, Overload protection, ON/OFF Buttons and Indicator Lights including all other accessories for proper fuctioning. The pumps shall be connected in that when the Running Duty pump fails the Standby Pump starts up automatically.	ITEM	1		
	TOTAL ROOT BLOWER SYSTEM CARRIED FORWARD TO BILL NO. 14.2 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 14.3 (FIRE FIGHTING AND PROTECTION SERVICES); Supply,deliver and install the following Portable Fire Extinguishers to positions indicated on the conract drawings and as instructed by the Engineer:-				
14.3.1	Portable Fire Extinguisher 9Kg catridge type general purpose portable dry powder fire extingusher fully charged or equal and approved.	NO	24		
14.3.2	Carbon dioxide Gas Fire Extinguisher 5kg carbon dioxide gas portale fire extinguisher complete with pressure gauge,initial charge and mounting brackets	NO	24		
14.3.3	Water Carbon Dioxide 9.0Litre Water carbon dioxide (WCo2) portable fire extinguisher complete wth pressure gauge,initial charge and mounting brackets.	NO	24		
14.3.4	Signage Allow for the Signage for fire exits and fire instructions all as described in the particular specifications and to the Project Enginneer's Approval.	ITEM	24		
14.3.5	Testing Allow for testing the whole fire fighting equipments to leave in sound working condition and to the Engineer's satisfaction	ITEM	24		
	FIRE FIGHTING AND PROTECTION SERVICES				
	Supply,deliver and install the following fire fighting equipment in positions indicated on the contract drawings or as shall be instructed by the Engineer.Tenderers during pricing should allow for all fittings,jointings,couplings,including unions and clamps,where necessary for the proper functioning of the installation.				
14.3.6	Hose Reels. 20mm diameter x 30Metre long swinging type hose reel complete with delivery hose,nozzle,mild steel feed pipe,isolation valve,guide,bracket and all other accessories.	No.	14		
14.3.7	Hose Reel Fire Tank Supply, deliever and install vertical close end plastic moulded tank of capacity **10,000 Litre (Size 1830 diameter x 2020mm high).**The tank to be assembled complete with cover and having screwed connections for inlet, outlet and overflow, 32mm medium pressure ball valve, drain pipes and any other necessary item for its proper functioning. The tank shall be mounted on a flat slab.	ITEM	2		
	Pipework (G.I)				
14.3.8	20mm diameter medium grade galvanized mild steel supply pipe	LM	12		
14.3.9	25mm ditto	LM	80		
14.3.10	50mm Ditto	LM	250		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	Sockets				
14.3.11	25mm diameter (G.I)socket	No.	20		
14.3.12	50mm Ditto	No.	50		
	Unions				
14.3.13	25mm diameter (G.I)union	No.	15		
14.3.14	50mm Ditto	No.	45		
	Bends/Elbows				
14.3.15	25mm diameter (G.I) bend	No.	24		
14.3.16	50mm Ditto	No.	20		
	Tees				
14.3.17	25mm diameter (G.I)equal tee	No.	20		
14.3.18	50mm Ditto	No.	12		
	Reducers				
14.3.19	50x25mm ditto	No	14		
	Nipples				
14.3.20	50mm (G.I) nipple	No.	4		
	Painting				
14.3.21	Prepare prime and apply two coats of gloss oil paint - RED - on the general surfaces of the above described Hose Reel supply pipes	ITEM	1		
	Hose Reel Booster Pump Set				
14.3.22	Booster Pump Set for Hose Reels consisting of 2No. parallel duty pumps mounted on a common G.I. base Frame to approval,each of capacity **12m3/hr** against a Maximum Head of **15(metres)**. The pump set shall be complete with control panel, MCBS, Pressure and Float switches, Overload protection, ON/OFF Buttons, Indicator Lights, Non -Return and Gate valves and a Pressure Vessel of Approx Capacity **300Litres** including all other accessories for proper fuctioning. The pumps shall be connected in that when the Running Duty pump fails the Standby Pump starts up automatically.	ITEM	1		
	Testing				
14.3.23	Allow for connecting the above earlier described Booster pumps to the pump delivery and suction lines, including Test Pumping and testing the whole of the water Reticulation system both during progress and at commissioning to the Engineer's satisfaction and to leave the system in good and sound working condition	ITEM	1		
	TOTAL FOR ELEMENT NO. 14.3 (FIRE FIGHTING) CARRIED FORWARD TO BILL NO. 14 SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 14.4; ON-SITE WASTEWATER TREATMENT PLANT				
	WASTE WATER TREATMENT SYSTEM Waste Water Treatment Plant				
14.4.1	Supply, Install, Test and Commission the Moving Bed Biofilm Reactor (MBBR) Waste Water Treatment System, With a capacity of treating **650PE** with an average flow rate of **103,000 lts per day**. With a **BOD load of 40Kgs per day**, **Ammonia Nitrogen load of 4Kgs per day**. With minimum treated discharge requirment of **BOD <30mg/lt, TSS <30mg/lt, Ammonia Nitrogen <20mg/lt.** Complete with all Media, Screens, Pumps, Aeration Blowers, Aeration Diffusers, Manifolds, Level sensors, Valves, Piping, Fittings and Accessories to fully conform to the specificied discharge requirements.				
14.4.2	Main control panel (MCP), NEMA 4 free-standing enclosure with forced air ventilation. The MCP is the "intelligence" of the treatment process. Electrical Control Panel with PLC, electrial isolators, overload protction, Equipment running and trip indication lights, automatic and manual overide switches. Minimum IP 55 enclosure. Audio-visual alarm indicator to be provided outside the control shed. Allow for PLC complete with Graphical Human Machine Interface (HMI). Alarm, fault and process indicators will be displayed on the process control panel.	NO	1		
14.4.3	Allow for high specification internet based Remote Monitoring & Control using GSM/GPRS/IoT technology with real-time monitoring, control and alerts of the status and alarms of the plant's operations by both supplier and client parties. User acess via mobile phone App, web protal,SMS/Email alterts for critical plant condition.	SUM	1		
14.4.4	Allow for MBBR media of High Quality Virgin High Density Polyethylene (HDPE). Quality of media shall have Specific Gravity of 0.96 and bulk density of 125kg/m3. Required Surface Area specification shall be 675m2/m3.	SUM	1		
14.4.5	Process Aeration Blowers 1.6 kW / 3 HP positive displacement (PD), one (1) duty, one (1) standby.	NO	2		
14.4.6	Fine bubble aeration system, in-basin pipes and connections to the top of the wall of the basin.	SUM	1		
14.4.7	9" Fine Bubble Disc diffusers. Specification is PTFE coated EPDM membranes. PTFE protective layer is to ensure extended useful lifspan of diffusers over standard EPDM diffuser products.	NO	35		
	Allow for Coarse inlet Screen 2" slots for capture of large rags and solids. Fabricated with 50mm polypropelyne structure & Stainless Steel.	NO	1		
	TOTAL CARRIED TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
14.4.8	Allow for PolyLok PL-625 Effluent Filter with 1/32" linear feet filter slot size for capture of smaller fine solids. E.fluent Filter shall come with automatic shutoff ball for closing outlet to avoid solids wash through during servicing, as acting as a gas deflector.	NO	3		
14.4.9	1 HP submersible RAS/WAS pumps	NO	1		
14.4.10	Influent pumps, one (1) duty and one (1) standby	NO	2		
14.4.11	Chemical dosing pumps and controls for sodium hypochlorite, plus chemical makeup tank. System for Chlorine Disinfection of Treated Waste Water.	SUM	1		
14.4.12	All pipe & fittings as required to complete the interconnecting system and all necessary fittings, valves and accessories.	SUM	1		
14.4.13	All Electrical wiring as required to complete the interconnecting system and all necessary conduits, fittings and accessories.	SUM	1		
14.4.14	Allow for Installation of Wastewater Treatment Plant Equipment, incldue all Labour, Transport & Sundries Costs	SUM	1		
	TOTAL FOR ELEMENT NO. 14.4 (ON-SITE WASTEWATER TREATMENT PLANT) CARRIED FORWARD TO BILL NO. 14 SUMMARY PAGE BELOW				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 14.5; GENERAL ITEMS				
	PRELIMINARIES & CONDITIONS OF CONTRACT				
14.5.1	Allow for mobilization and setting up stores, tools and all necessary equipment on site	Item	1		
14.5.2	Allow for co-ordination of works with the Main Contractor and other Sub-contractors	Item	1		
14.5.3	Allow for preparation of all "shop" drawings and submitting to the Engineers for approval prior to commencement of work on site	Item	1		
14.5.4	Arrangement for all factory inspections and tests that may be required by the Project Engineers/Client and shall provide all instruments and equipment required for these tests.	Item	4		
14.5.5	Allow for preparation of all "As Built" Drawings immediately after Practical Completion of the works.	Item	1		
14.5.6	Allow for the preparation of all "Operations & Maintenance Manuals" immediately after Practical Completion of the works.	Item	1		
14.5.7	Allow for on-site Training of the Operators for specialised equipment	Item	1		
14.5.8	Allow for all the preliminaries relating to this contract as specified	Item	1		
14.5.9	Allow for city council water connection & borehole meter connection	Item	1		
	TOTAL FOR ELEMENT NO. 14.4 PRELIMINARIES & CONDITIONS OF CONTRACT) CARRIED FORWARD TO BILL NO. 14 SUMMARY PAGE BELOW				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BILL NO. 14; HATCHERY BLOCKS MECHANICAL WORKS SUMMARY PAGE :-				
14.1	RECIRCULATING AQUACULTURE SYSTEM BROUGHT FORWARD FROM MW/24				
14.2	ROOT BLOWER SYSTEM BROUGHT FORWARD FROM MW/26				
14.3	FIRE FIGHTING SYSTEM BROUGHT FORWARD FROM MW/28				
14.4	ON-SITE WASTEWATER TREATMENT PLANT BROUGHT FORWARD FROM ABOVE				
14.5	PRELIMINARIES & CONDITIONS OF CONTRACT BROUGHT FORWARD FROM ABOVE				
	TOTAL FOR BILL NO. 14 (HATCHERY BLOCKS MECHANICAL WORKS) CARRIED FORWARD TO MECHANICAL WORKS MAIN SUMMARY PAGE BELOW				
	MECHANICAL WORKS SUMMARY PAGE :-				
13	BILL NO. 13; (3 NO. ABLUTION BLOCKS) BROUGHT FORWARD FROM MECH/15				
14	BILL NO. 14; (HATCHERY BLOCKS) BROUGHT FORWARD FROM ABOVE				
	TOTAL FOR MECHANICAL WORKS CARRIED FORWARD TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive)				
	BILL NO. 15; ELECTRICAL INSTALLATIONS				
	Supply Install, Test and Commission Following:-				
	ELEMENT NO. 15.1				
	LIGHTING POINTS				
	HATCHERY				
15.1.1	Lighting points wired in 3x1.5mm^2 PVC/SC copper cables drawn in concealed 20mm diameter heavy gauge PVC conduit including all boxes, saddles and accessories for				
	i) One way switching	No.	54		
	ii) Two way switching	No.	2		
15.1.2	10A moulded ivory type switch plates as approved by the Engineer as follows				
	i) One gang one way	No.	7		
	ii) Two gang one way	No.	4		
	LIGHTING FITTINGS				
15.1.3	Lighting fittings complete with all the necessary fixing accessories and lamps as follows:-				
	i) Type 4C	No.	28		
	ii) Type 4U	No.	16		
	iii) Type M	No.	8		
	iv) Exit Light	No.	4		
15.1.4	Motion Sensors for lighting	No.	8		
	SOCKET OUTLETS / POWER POINTS.				
15.1.5	Socket outlet point comprising wiring in 3x2.5 mm^2 PVC-SC-Cu cables on concealed 20mm diameter PVC conduits	No	36		
15.1.6	13A 2 gang switched water proof moulded socket outlet plate	No	36		
15.1.7	Single phase isolator point comprising of wiring in 3x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No	6		
15.1.8	Three phase isolator point comprising of wiring in 5x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No	3		
15.1.9	32A Single phase Isolator complete with 3 pin industrial socket and plug	No	6		
15.1.10	32A Three phase Isolator complete with 5 pin industrial socket and plug	No	3		
	DISTRIBUTION BOARDS				
15.1.9	8- way TP/N distribution board flush mounted complete 1No. TP/N intergral isolator	No	1		
15.1.10	**MCBs (original)**				
	ii)16A SP	No.	4		
	iii)32A SP	No.	10		
	iv)32A TP	No.	3		
	v)Blanking plates	No.	1		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F/ FROM PREVIOUS PAGE				
	SUB-MAINS CABLE				
15.1.11	4 core 25mm^2 PVC/SWA/PVC (armoured) + 1X16mm^2 single Core copper cables drawn inside 50mm diameter HG conduits	Lm	220		
15.1.12	Cable glands for the above cable	No.	2		
15.1.13	Cable lugs for the above cable complete with hydraulic crimping	No.	10		
	TELEVISION, CCTV AND DATA WORKS				
15.1.14	16 SWG,(450 x 300 x 100)mm³ flush mounted galvanised powder coated draw box for telephone & data works	2	No		
15.1.15	Telephone/Data outlet point comprising of concealed 20mm diameter HG PVC conduits plus draw wire	15	No		
	FIRE DETECTION AND ALARM SYSTEM				
15.1.16	Fire alarm panel/Fire alarm bell/Break glass Unit Points/Smoke detector points comprising iring in 3×1.5mm2 fire risistant cables concealed in PVC conduits concealed in ceiling space but excluding bell and break glass unit	No.	17		
15.1.17	Addressable Call point	No.	4		
15.1.18	Addressable Sounder complete with beacon	No.	4		
15.1.19	Addressable Smoke detectors complete with base	No.	8		
15.1.20	Addressable Repeater Panel with atleast 30 characters LCD screen and RS483 Port	No.	1		
15.1.21	SUB- TOTAL FOR 1 No. HATCHERY				
	TOTAL FOR 2 No. HATCHERY (ITEM ABOVE x 2) C/F TO COLLECTION SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 15.2 LIGHTING POINTS ALGAE PRODUCTION PLANT				
15.2.1	Lighting points wired in 3x1.5mm^2 PVC/SC copper cables drawn in concealed 20mm diameter heavy gauge PVC conduit including all boxes, saddles and accessories for				
	i) One way switching	No.	24		
	ii) Two way switching	No.	54		
15.2.2	10A moulded ivory type switch plates as approved by the Engineer as follows				
	i) One gang one way	No.	9		
	ii) One gang two way	No.	6		
	iii)Three gang two way	No.	4		
	LIGHTING FITTINGS				
15.2.3	Lighting fittings complete with all the necessary fixing accessories and lamps as follows:-				
	i) Type 4C	No.	64		
	ii) Type 4U	No.	8		
	iii) Type M	No.	8		
	iv) Exit Light	No.	6		
15.2.4	Motion Sensors for lighting	No.	7		
	SOCKET OUTLETS / POWER POINTS.				
15.2.5	Socket outlet point comprising wiring in 3x2.5 mm^2 PVC-SC-Cu cables on concealed 20mm diameter PVC conduits	No	24		
15.2.6	13A 2 gang switched water proof moulded socket outlet plate	No	24		
15.2.7	Single phase isolator point comprising of wiring in 3x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No	5		
15.2.8	Three phase isolator point comprising of wiring in 5x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No	3		
15.2.9	32A Single phase Isolator complete with 3 pin industrial socket and plug	No	5		
15.2.10	32A Three phase Isolator complete with 5 pin industrial socket and plug	No	3		
	DISTRIBUTION BOARDS				
15.2.9	8- way TP/N distribution board flush mounted complete 1No. TP/N intergral isolator	No	1		
15.2.10	MCBs (original)				
	ii)16A SP	No.	4		
	iii)32A SP	No.	9		
	iv)32A TP	No.	3		
	v)Blanking plates	No.	2		
	SUB-MAINS CABLE				
15.2.11	4 core 25mm^2 PVC/SWA/PVC (armoured) + 1X16mm^2 single Core copper cables drawn inside 50mm diameter HG conduits	Lm	66		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F/ FROM PREVIOUS PAGE				
15.2.12	Cable glands for the above cable	No.	2		
15.2.13	Cable lugs for the above cable complete with hydraulic crimping	No.	10		
	TELEVISION, CCTV AND DATA WORKS				
15.2.14	16 SWG,(450 x 300 x 100)mm³ flush mounted galvanised powder coated draw box for telephone & data works	2	No		
15.2.15	Telephone/Data outlet point comprising of concealed 20mm diameter HG PVC conduits plus draw wire	13	No		
	FIRE DETECTION AND ALARM SYSTEM				
15.2.16	Fire alarm panel/Fire alarm bell/Break glass Unit Points/Smoke detector points comprising iring in 3×1.5mm2 fire risistant cables concealed in PVC conduits concealed in ceiling space but excluding bell and break glass unit	No.	29		
15.2.17	Addressable Call point	No.	8		
15.2.18	Addressable Sounder complete with beacon	No.	8		
15.2.19	Addressable Smoke detectors complete with base	No.	12		
15.2.20	Addressable Repeater Panel with atleast 30 characters LCD screen and RS483 Port	No.	1		
	TOTAL FOR ALGAE PRODUCTION C/F TO COLLECTION SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 15.3 LIGHTING POINTS HEAD OF UNIT OFFICE				
15.3.1	Lighting points wired in 3x1.5mm^2 PVC/SC copper cables drawn in concealed 20mm diameter heavy gauge PVC conduit including all boxes, saddles and accessories for i) One way switching	No.	17		
15.3.2	10A moulded ivory type switch plates as approved by the Engineer as follows i) One gang one way	No.	4		
	LIGHTING FITTINGS				
15.3.3	Lighting fittings complete with all the necessary fixing accessories and lamps as follows:-				
	i) Type 600X600	No.	2		
	ii)Type 2	No.	8		
	iii) Type 2D	No.	4		
	iv) Type M	No.	3		
15.3.4	Motion Sensors for lighting	No.	7		
	SOCKET OUTLETS / POWER POINTS.				
15.3.5	Socket outlet point comprising wiring in 3x2.5 mm^2 PVC-SC-Cu cables on concealed 20mm diameter PVC conduits	No	5		
15.3.6	13A Twin switched moduled socket outlet plate	No	5		
15.3.7	20A Double Pole outlet point comprising of wiring in 3x4.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No.	5		
15.3.8	20A Double pole switch complete with neon light		5		
15.3.9	Ceiling fan points wired in 3x2.5mm2 PVC/SC copper cables drawn in concealed 20mm diameter heavy gauge PVC conduit including all boxes, saddles and all accessories	No.	1		
15.3.10	49W 1400mm 3-arm 5- speed, Ceiling fan complete with the regulator	No.	1		
	DISTRIBUTION BOARDS				
15.3.9	9- way SP/N Consumer Unit flush mounted complete 1No. SP/N intergral isolator	No	1		
15.3.10	MCBs (original)				
	ii)16A SP	No.	2		
	iii)32A SP	No.	1		
	iv)20A SP	No.	5		
	v)Blanking plates	No.	1		
	SUB-MAINS CABLE				
15.3.11	3 core 10mm^2 PVC/SWA/PVC (armoured) copper cables drawn inside 50mm diameter HG conduits	Lm	250		
15.3.12	Cable glands for the above cable	No.	2		
15.3.13	Cable lugs for the above cable complete with hydraulic crimping	No.	6		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F/ FROM PREVIOUS PAGE				
	TELEVISION, CCTV AND DATA WORKS				
15.3.14	16 SWG,(450 x 300 x 100)mm³ flush mounted galvanised powder coated draw box for telephone & data works	1	No		
15.3.15	Telephone/Data outlet point comprising of concealed 20mm diameter HG PVC conduits plus draw wire	4	No		
	FIRE DETECTION AND ALARM SYSTEM				
15.3.16	Fire alarm panel/Fire alarm bell/Break glass Unit Points/Smoke detector points comprising iring in 3×1.5mm2 fire risistant cables concealed in PVC conduits concealed in ceiling space but excluding bell and break glass unit	No.	3		
15.3.17	Addressable Call point	No.	1		
15.3.18	Addressable Sounder complete with beacon	No.	1		
15.3.19	Addressable Smoke detectors complete with base	No.	1		
15.3.20	SUB- TOTAL FOR 1 No. HOU OFFICE				
15.3.21	TOTAL FOR 3 No. HOU OFFICES (ITEM ABOVE X 3)				
15.3.22	Fire alarm panel/Fire alarm bell/Break glass Unit Points/Smoke detector points comprising iring in 3×1.5mm2 fire risistant cables concealed in PVC conduits concealed in ceiling space but excluding bell and break glass unit	No.	1		
15.3.23	Single Loop, Expandable to 8, Intelligent Addressable fire alarm panel with atleast 200 addresses complete with full network capability,stand-by batteries and intergral battery charger, touch screen, thermal printer and CAN modules	No.	1		
	TOTAL FOR HEAD OF UNIT OFFICES C/F TO COLLECTION SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 15.4 LIGHTING POINTS POWER HOUSE, R.O. PLANT ROOM, PUMP HOUSES, BATTERY ROOM & GATE HOUSE				
15.4.1	Lighting points wired in 3x1.5mm^2 PVC/SC copper cables drawn in concealed 20mm diameter heavy gauge PVC conduit including all boxes, saddles and accessories for				
	i) One way switching	No.	34		
	ii) Two way switching	No.	10		
15.4.2	10A moulded ivory type switch plates as approved by the Engineer as follows				
	i) One gang one way	No.	7		
	ii) One gang two way	No.	6		
	LIGHTING FITTINGS				
15.4.3	Lighting fittings complete with all the necessary fixing accessories and lamps as follows:-				
	i) Type 4C	No.	19		
	ii)Type 2	No.	2		
	iii) Type M	No.	23		
	iv) Exit Light	No.	9		
15.4.4	Motion Sensors for lighting	No.	9		
	SOCKET OUTLETS / POWER POINTS.				
15.4.5	Socket outlet point comprising wiring in 3x2.5 mm^2 PVC-SC-Cu cables on concealed 20mm diameter PVC conduits	No	16		
15.4.6	13A 2 gang switched water proof moulded socket outlet plate	No	16		
15.4.7	Single phase isolator point comprising of wiring in 3x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No	2		
15.4.8	Three phase isolator point comprising of wiring in 5x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No	1		
15.4.9	32A Single phase Isolator complete with 3 pin industrial socket and plug	No	2		
15.4.10	32A Three phase Isolator complete with 5 pin industrial socket and plug	No	2		
15.4.11	20A Double Pole outlet point comprising of wiring in 3x4.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No.	1		
15.4.12	20A Double pole switch complete with neon light	No.	1		
	DISTRIBUTION BOARDS				
15.4.13	8- way TP/N distribution board flush mounted complete 1No. TP/N intergral isolator	No	1		
15.4.14	4- way TP/N Distribution Board flush mounted complete 1No. SP/N intergral isolator	No	1		
15.4.15	4- way SP/N Consumer Unit flush mounted complete 1No. SP/N intergral isolator	No	3		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F/ FROM PREVIOUS PAGE				
15.4.16	MCBs (original)				
	i)20A SP	No.	1		
	ii)16A SP	No.	5		
	iii)32A SP	No.	5		
	iv)32A TP	No.	5		
	v)Blanking plates	No.	17		
	SUB-MAINS CABLE				
15.4.17	4 core 35mm^2 PVC/SWA/PVC (armoured) + 1X16mm^2 single Core copper cables drawn inside 50mm diameter HG conduits to R.O. Plant Room	Lm	300		
15.4.18	3 core 10mm^2 PVC/SWA/PVC (armoured) copper cables drawn inside 50mm diameter HG conduits to Gate House, Pump Room, Battery Room, Power Rooms Including Service to sea water pump fromDB 'B" in Pump room 2	Lm	350		
15.4.19	Cable glands for the above cables	No.	14		
15.4.20	Cable lugs for the above cable complete with hydraulic crimping	No.	44		
	TELEVISION, CCTV AND DATA WORKS				
15.4.21	16 SWG,(450 x 300 x 100)mm³ flush mounted galvanised powder coated draw box for telephone & data works	5	No		
15.4.22	Telephone/Data outlet point comprising of concealed 20mm diameter HG PVC conduits plus draw wire	2	No		
15.4.23	TV outlet point comprising of 75Ω aerial cable (Co-axial) drawn in 25mm Ø full length heavy gauge plastic conduits cast in floor slab and concealed in the walls but without the outlet plate running from the TV point to the MATV on the roof	1	NO		
15.4.24	Single TV face plate	1	NO		
	FIRE DETECTION AND ALARM SYSTEM				
15.4.25	Fire alarm panel/Fire alarm bell/Break glass Unit Points/Smoke detector points comprising iring in 3×1.5mm2 fire risistant cables concealed in PVC conduits concealed in ceiling space but excluding bell and break glass unit	No.	20		
15.4.26	Addressable Call point	No.	5		
15.4.27	Addressable Sounder complete with beacon	No.	5		
15.4.28	Addressable Smoke detectors complete with base	No.	1		
15.4.29	Addressable Heat detectors complete with base	No.	7		
15.4.30	Addressable Repeater Panel with atleast 30 characters LCD screen and RS483 Port	No.	2		
	TOTAL FOR POWER HOUSE, R.O. PLANT ROOM, PUMP HOUSES, BATTERY ROOM & GATE HOUSE C/F TO COLLECTION SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
15.5.1	ELEMENT 15.5 MAIN POWER DISTRIBUTION LOW VOLTAGE BOARD Free-standing purpose made front access sub main switchboard, modular, metal clad, manufactured in 12 SWG galvanised mild steel sheet and finished in cream (or appropriate colour) powder coating as shown on the schematic. The switchboard should consist of a PLC section. The switchboard to be complete with the following:- i) Digital multimeter with CTs and fuse protection capable of measuring voltage in the range 0 – 1000V, 3-phase, current in the range 0-630A, 3-phase, and all power system parameters (KW, KVA, KWHr, KVArs, Frequency, P.F., harmonics and all the parameters). The multimeter should be complete with selector switches for viewing/displaying the various parameters. ii) Set of neon phase presence indicator lamps iii) 250A adjustable TPN MCCB main incomer and having a short-circuit breaking capacity of 100KA at 415Vac, 50Hz. iv) 4 No. 250A TPN copper bus bars v) 7 No. 100A 3 P TPN MCCBs vi) 9 No. 63A SPN MCBs vii) 2 No. 32A SPN MCBs viii) Sufficient spare capacity for future development all fitted with 2 No. 63A SP MCBs ix) Sufficient spare capacity for future development all fitted with 4 No. 125A TP MCCBs x) Sealable studs for all cover plate screws and all necessary accessories xi) 6mm perspex viewing window xii) Heavy duty rubber lining for all the perspex viewing windows xiii) 415V three-phase surge diverter, wired as shown, complete with enclosure with viewing window. xiv)55 KVAr's automatic Power Factor Correction Capacitor Bank comprising the following:- a) 1 No 20 KVAr's 415 V,50Hz, 3-Phase b) 1 No 10 KVAr's 415 V,50Hz, 3-Phase c) 5 No 5 KVAr's 415 V,50Hz, 3-Phase d) 7 No Special contactors for capacitor switching e) 7 No Fuse bases and fuses for each capacitor protection f) 7 No Step indicator lamps g) 7 No Control circuit protection fuse/fuse holder h) 1 No. 7-Step automatic control regulator for maintaining power factor at the set level and regulating the switching of capacitor steps i) 1 No 250/5A Current transformer (to be mounted after the mains incoming circuit breaker) **The bank to be made from low-loss bio-degradable capacitive units, complete with earthed enclosure. All the contactors, controls and indicator lamps, including a digital read-out screen, to be included.** xvi) Allow for Fireman's switch connection as indicated in the schematic drawing	Item	1		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
15.5.2	xvi) Comprehensive protective multiple earthing of the board in 1500mm long 12mm diameter pure electrolytic copper earth rod deep driven to permanent moisture level, copper clamp. 120mm² green earth lead complete with all accessories. (Note: Use parallel rods if effective earthing cannot be achieved with 1 No. rod). Free-standing purpose made front access Splitter switchboard, modular, metal clad, manufactured in 12 SWG galvanised mild steel sheet and finished in cream (or appropriate colour) powder coating as shown on the schematic. The switchboard should consist of a PLC section. The switchboard to be complete with the following:- i) Digital multimeter with CTs and fuse protection capable of measuring voltage in the range 0 – 1000V, 3-phase, current in the range 0-630A, 3-phase, and all power system parameters (KW, KVA, KWHr, KVArs, Frequency, P.F., harmonics and all the parameters). The multimeter should be complete with selector switches for viewing/displaying the various parameters. ii) Set of neon phase presence indicator lamps iii) 630A adjustable TPN MCCB main incomer and having a short-circuit breaking capacity of 100KA at 415Vac, 50Hz. iv) 4 No.630A TPN copper bus bars v) 1 No. 400A Adjustable TPN MCCBs Resource Center vi) 1 No. 250A Adjustable TPN MCCBs Hatchery vii) 1 No. 100A TPN MCCBs Existing Loads viii) Sufficient spare capacity for future development all fitted with 2 No. 63A SP MCBs ix) Sufficient spare capacity for future development all fitted with 2 No. 125A TP MCCBs x) Sealable studs for all cover plate screws and all necessary accessories xi) 6mm perspex viewing window xii) Heavy duty rubber lining for all the perspex viewing windows xiii) 415V three-phase surge diverter, wired as shown, complete with enclosure with viewing window. xiv) Comprehensive protective multiple earthing of the board in 1500mm long 12mm diameter pure electrolytic copper earth rod deep driven to permanent moisture level, copper clamp. 120mm² green earth lead complete with all accessories. (Note: Use parallel rods if effective earthing cannot be achieved with 1 No. rod). xv) Space for Kenya Power's cut-outs. CTS and meters. The spaces to be provided with punched studs for installing KPLC seals.	Item	1		
15.5.3	4 core 35mm^2 PVC/SWA/PVC (armoured) + 1X16mm^2 single Core copper cables drawn inside 50mm diameter HG conduits to Existing Loads	Lm	300		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
15.5.4	150mm^2 PVC/SWA/PVC single core armoured copper cable laid in ducts in trench from main splitter board to Resource center low voltage board complete with glands and lugs to hatchery board	LM	60		
	SEA WATER INTAKE PUMP PROVISIONS				
15.5.5	4 core 35mm^2 PVC/SWA/PVC (armoured) + 1X16mm^2 single Core copper cables complete with glands and lugs to Sea Water Intake Pump	Lm	600		
15.5.6	32A Three phase Isolator complete with 5 pin industrial socket and plug	No	1		
15.5.7	32A Three Phase Automatic Voltage Stabilizer	No.	1		
	UNDERGROUND CABLE DUCTING				
15.5.8	Allow for 300mm deep trecncing and back filling for ICT.	Lm	700		
15.5.9	Ducting for the above in 150mm HGPVC Pipes complete with haunching	Lm	700		
15.5.10	Allow for cable markers in concrete tiles marked "ELV" for the item above	No.	20		
	BIO- DIGETSTER PROVISIONS				
15.5.11	4 core 25mm^2 PVC/SWA/PVC (armoured) copper cables drawn inside 32mm diameter HG conduits	Lm	120		
15.5.12	Cable glands for the above cable	No.	2		
15.5.13	Cable lugs for the above cable complete with hydraulic crimping	No.	10		
15.5.14	8-Way TP/N distribution board flush mounted complete 1No. 100A TPN integral isolator.	No.	1		
15.5.15	MCBs for the boards above				
	i)16A SP	No.	1		
	ii)20ASP	No.	3		
	iii)32ASP	No.	5		
	iv)32A TP	No.	4		
	v)Blanking Plates	No.	3		
15.5.16	Single phase isolator point comprising of wiring in 3x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No.	5		
15.5.17	Three phase isolator point comprising of wiring in 5x6.0 mm^2 PVC-SC-Cu cables drawn inside 20mm diameter HG conduits	No.	4		
15.5.18	32A Single phase Isolator complete with 3 pin industrial socket and plug	No.	5		
15.5.19	32A Three phase Isolator complete with 3 pin industrial socket and plug	No.	4		
15.5.20	150 x 100mm 12 gauge galvanised steel perforated cable tray for support of the cables.	Lm,	250		
	TOTAL FOR POWER DISTRIBUTION C/F TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT 15.6 SOLAR P.V. SYSTEM				
15.6.1	144 Cell, 585W Mono- Crystalline Solar Modules with durability against extreme environmental conditions like high salt mist and ammonia resistance, Efficiency 80%,Cell Specific Safety - Class II, Application Class A, Life time - 30Years, Guarantee - 10Years Rated Current (Im) 13.76A Maximum Power Voltage (Vmp) 42.52v, Cell Efficiency - 22.65%	No.	273		
15.6.2	96.8KWh Lithium Battery Pack Smart Stirng Energy Storage System (ESS) including a smart Rack Controller. Max Charging & Discharge power: 92kW, IP65, Class A EMC Protection Rating, Type II DC Lightning Protection. Smart Rack efficiency: +98.5%,	Item	1		
15.6.3	Smart Power Control System, 50kW DC/AC hybrid Power inverter full protection function:over-voltage, over-frequency, over-current, over-temperature, AC short-circuit automatic protection, max MPPT number: 10 Rated Output power 50KW MPPT efficiency of upto 98.8% Pure Sinewave output	No.	3		
15.6.4	Solar MPPT charge controller with the following characteristics; PV open circuit voltage 500V, Max PV power 150KW, PV rated current 100A, MPPT input voltage 100-150vdc LCD display: Solar panel current, Solar panel voltage, Solar panel power, Battery group voltage,charge & current Protection function against solar reverse charge, solar reverse connection, battery reverse connection, battery overcharge , battery overcurrent	Item	1		
15.6.5	Non-corrosive Racks/brackets to fit for solar panels support system. To be Alluminium or approved equivalent resisting corrosion	Item	1		
15.6.6	Solar surge protection device rated for 300VDC or to the Engineers approval	No.	1		
15.6.7	List any other item necessary to complete the installation of the 150KW solar system	Lot	1		
	TOTAL FOR HYBRID SOLAR POWER C/F TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 15.7 3 PHASE GENERATOR				
	Diesel Generator model C100 D5 enclosed set 150 KVA Prime rated complete with following:-				
15.7.1	Supply, deliver to site, install, test and commission a prime rated 150 KVA 3 phase, 415V, 50Hz diesel generating set with a continuous power factor of 0.8 lagging as directed by the Engineer's specifications. The generator set is to be complete with a sound attenuated canopy and an integral base/belly daily service fuel tank with an operational running capacity of 8 hours.	Item	1		
15.7.2	150mm^2 PVC/SWA/PVC single core armoured copper cable laid in ducts in trench from main splitter board to Resource center low voltage board complete with glands and lugs	LM	60		
15.7.3	Allow for trenching and back filling for above cable	LM	60		
15.7.4	Allow for Hatari tiles for above item	No.	2		
15.7.5	Supply, deliver to site and install a steel exhaust pipe of not less than 14 SWG and of adequate diameter running from the generating set to the outside of the generator house	LM	10		
15.7.6	Connect the exhaust pipe above in item 5.7.2 using steel pipes of adequate diameter, and flexible piping off engine exhaust manifold complete with heavy duty silencer	Item	1		
15.7.7	Complete earthing of generating set to electrical engineer's approval	Item	1		
	AMF CONTROL PANEL				
	Supply, deliver to site, install, test and commission the following:				
15.7.8	An electrical control panel complete with suitable rated incoming MCCBs and contactors for automatic change over operation and complete with all other control accessories	No	1		
15.7.9	250A Automatic Transfer Switch with manual by-pass switch with clearly labeled **NORMAL-OFF-BYPASS** positions, **and shall such be wired that when the switch is on either OFF or BYPASS position, the generator shall receive no signal to start**	No.	1		
15.7.10	240V AC/12V DC mains power supply trickle battery charger as directed by the Engineer's specifications. The trickle charger shall charge the battery when the set is on **IDLE mode**, otherwise when the set is **RUNNING**, the battery shall be charged by the **generator charger**.	No.	1		
15.7.11	12 volts battery as directed by the Engineer's specifications	No.	1		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	For the supply to the site of the following spare parts and lubricators:				
15.7.12	Oil Filters	No.	2		
15.7.13	Air Filters	No.	2		
15.7.14	Fuel filters to suit the set	No.	2		
15.7.15	Set of Fan belts to suit the set	No.	1		
15.7.16	10 litres container of sump oil of grade.....*	No.	1		
15.7.17	2 kilogram grease in a tin of grade .....*	No.	1		
15.7.18	10 litre plastic container of distilled water	No.	1		
15.7.19	20 litre of engine oil in a tin of grade .....*	No.	1		
15.7.20	Any other spare parts recommended by Tenderer **	Sum	1		
	SCHEDULE 4 -TOOLS TO BE SUPPLIED WITH THE SET				
	For the supply to site of the following tools:				
15.7.21	Metal tool box with lock and two keys	No.	1		
15.7.22	Set of 8 No. Chrome vanadium ring spanners in sizes to suit the set	No.	1		
15.7.23	Set of 3 screwdrivers, 75mm, 200mm and 300mm plus one 200mm Philips type	No.	1		
15.7.24	- ditto -but open ended spanners	No.	1		
15.7.25	Set of feeler gauges	No.	1		
15.7.26	Set of 8 No. Ratchets in sizes to suit the set	No.	1		
15.7.27	Grease gun to suit greasing points complete with compressor	No.	1		
15.7.28	Oil can, trigger type	No.	1		
15.7.29	Any other special tools which the tenderer recommends should be purchased as an optional:*	Item	1		
	NOTE*The tenderer to fill in the Grade quality to be supplied **The tenderer to fill in the details and price of items but the price not to be included in total carried forward to summary page				
	TOTAL FOR 150KVA GENERATOR C/F TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT 15.8				
	LIGHTNING PROTECTION				
	Air Termination				
15.8.1	15mm diameter multiple point copper air terminal complete with base	No.	15		
15.8.2	Copper junction clamps for tape.	No.	10		
15.8.3	25 x 3mm turned copper tape	Lm	100		
15.8.4	Copper ridge saddle	No.	10		
15.8.5	D.C. tape clip	No.	30		
	Down Conductors				
15.8.6	25 x 3mm turned copper tape	Lm	50		
15.8.7	D.C. tape clip	No.	30		
15.8.8	Oblong test/junction clamp	No.	12		
15.8.9	Diameter 38mm HG PVC conduits for the down conductors above.	Lm	60		
	Earth Termination				
15.8.10	15mm diameter, 1200mm long solid copper earth rod, complete with driving stud and spike.	No.	9		
15.8.11	Earth rod-to-tape clamp type A.	No.	9		
15.8.12	Concrete inspection earth pit with 5 hole earth bar	No.	9		
15.8.13	1500mm x 1500mm copper earth mat made from 25mm x 3mm copper tape at 300mm spacing, buried at permanent moisture level and complete with all clamps, welding joints and 6m long 25mm x 3mm insulated copper tape clamped to the down conductors.	No.	9		
15.8.14	Soil treatment around the earth pits with marconite to achieve the required conductivity and obtain acceptable reading	Item	1		
15.8.15	Bonding and clamping to all metal work including water pipes, gas pipes, hand-rails, air-conditioning units, window frames, cladding, metal roof etc. and the main earth for the building.	Item	1		
	TOTAL FOR LIGHTNING ARRESTORS C/F TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT 15.9 Supply, install, test, commission and set to work (To the full satisfaction of all parties to the contract) the following: - CCTV				
15.9.1	**Dome Camera** 4MP resolution, Excellent low light performance, Efficient H.265+ compression technology, IP67, 24/7 colourful imaging	No.	10		
15.9.2	Ditto but Bullet Cameras	No.	6		
15.9.3	Network Video Recording System base to be mounted in a 42U data Cabinet with the following features:- ● Up to 32 channel IP cameras can be connected ● Up to 576 Mbps high incoming bandwidth ensures IP cameras can be connected ● 2 HDMI (different source) and 1 VGA interfaces16 HDD can be used for continuous video recording ● 16 HDD can be used for continuous video recording ● Supports some specialist cameras, including people counting camera/ANPR (automatic number plate recognition) camera/fisheye camera ● Advanced streaming technology enables smooth live view in poor network conditions ● Supports RAID 0, 1, 5, 6, 10 and N+1 hot spare for even more reliable data storage, effectively avoids data loss risks	No.	1		
15.9.4	24 Port layer 2 100Mbps POE SFP Switch with Min 30W Power availability per port	No.	4		
15.9.5	GBIC transceiver modules (LC to LC) multimode for the switches above	No.	4		
15.9.6	Fibre Patch Panels for Data cable termination	No.	4		
15.9.7	9 U 600X600 wall mounted data cabinet complete with all accessories including power supply points	No.	4		
15.9.8	10TB Surveillance Hard Disk Drive	No.	8		
15.9.9	STP Cat 6 structured cables	Boxes	10		
15.9.10	STP Cat. 6 patch cord, 3M for the Cameras.	No.	30		
15.9.11	UPT Cat. 6A patch cord, 1M	No.	21		
15.9.12	Associated Fiber and UTP (CAT 6) cabling between field devices and Main Switch	Item	1		
	TOTAL FOR CCTV CARRIED FORWARD TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT 15.10				
	Supply, install, test, commission and set to work (To the full satisfaction of all parties to the contract) the following: -				
	ICT Horizontal Cabaling				
15.10.1	CAT 6A cable for Data/Telephone outlets	300	Lm		
15.10.2	Dual RJ45 Cat 6 outlets for voice / Data complete with faceplate and labeling	5	No.		
15.10.3	24 port CAT 6 Data Modular Patch Panel for 4-Pair UTP termination	1	No.		
15.10.4	1M Factory terminated Cat 6 4 pair-SFTP RJ 45- RJ 45 patch cords to be used inside cabinet **(includes 15No Spares)**	21	No.		
15.10.5	3M Factory terminated Cat 6 4 pair-SFTP RJ 45- RJ 45 patch cords for data outlets **(includes 15No Spares)**	21	No.		
15.10.6	2U Cable managers/organisers	1	No.		
	ACTIVE EQUIPMENT				
15.10.7	24 Port layer 2 100Mbps POE SFP Switch with Min 30W Power availability per port	4	No.		
	BACKBONE CABLING				
15.10.8	24 Port ST Multimode, sliding Fibre Optic patch panel complete with LC type connectors for Multimode fibre	1	No.		
15.10.9	1M Factory Terminated Fibre optic patch cords complete with LC-LC TYPE connectors to be used inside cabinet	20	No.		
15.10.10	8 core Loose tube multimode fibre optic cable linking floor edge switches to core switch in the Server room	400	LM		
15.10.11	RJ45-ST media converters for each edge switch	4	No.		
	SERVER				
15.10.12	42U Server rack cabinet, black complete with mounting angles and rails in Server Room as described in the particular specification of this tender document	1	No.		
15.10.13	24 port Core network switch for routing voice	1	No.		
15.10.14	24 port Core network switch equivalent for routing data	1	No.		
15.10.15	Router	1	No.		
15.10.16	2U Cable managers/organisers	4	No.		
15.10.17	Wireless Access point	4	No.		
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
	TELEPHONY				
15.10.18	Hybrid IP-PABX capable of handling 50 extensions to include GSM modules plus all accessories to work	1	No.		
15.10.19	Standard UC Phone complete with all accessories	4	No.		
15.10.20	Executive UC Phone complete with all accessories	3	No.		
15.10.21	Operator Phones complete with all accessories. Each takes up to 16 concurrent lines	1	No.		
15.10.22	Voice Gateways with 2 x E1 Cards each and 1 x 4 Port FXO Cards. These can host total of 136 ISDN + CO Lines	1			
15.10.23	Any other items necessary to complete the system installation satisfactorily. (List, give quantities and price of the items) i)…… ii)…… ii)…… iv)……				
	TOTAL FOR ICT ARRIED FORWARD TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT 11				
	GENERAL ITEMS				
15.11.1	Carry out comprehensive 24-hour power analysis, after installing main switchboard, but before switching on load with a digital power meter (with printer) to: i) Record and print all the power system parameters. ii) Submit 3 copies of the print-outs. **(Note: Parameters must be satisfactory before building is switched on).**	Item			
15.11.2	Allow for presentation of all the required samples as per specifications, Bills of Quantities and Drawings.	Item			
15.11.3	**Working/ Shop Drawings** Prepare and submit three sets of record (shop) plan and isometric layout drawings to easily readable scale, A1 or A0 paper size formart as follows: i) general arrangement drawings of all mechanical services, equipment, plant etc ii) routes-types and sizes and arrangement of all pipeworks iii) any other details as per specifications Drawings are to be submitted in soft copy (AutoCad/REVIT 2023) and hard copy to the client, the architect and the engineer. The soft copies to be stored in SSD drive. Allow for preparation and submitting draft and three final copies of operation, instruction and maintainance manuals to Engineers approvals.	Item			
15.11.4	**As Installed Drawings** As above but for as built/ installed drawings	Item			
15.11.5	Prepare and submit Maintenance Manuals for all items installed.	Item			
15.11.6	All other items of general preliminary to cover, but not limited to:- i) Attendance on all other sub-contractors, such as for Communication Services, Mechanical Installations, Security Installations, Sound Equipment/ Wiring Installations, Generator Installations, Lift Services, Solar Water Heating, V-Sat services etc. ii) Hiring and keeping a Supervisor/Foreman on site iii) Constant supervision of the works. iv) Provision of all the required spares. v) Testing and Inspection of materials/works. vi) Provision of labour camps. vii) Storage of materials. viii) Initial maintenance (During Defects Liability) ix) Providing water/electricity for the works. x) Protection of the works/materials xi) Clearing away on completion. xii) Preparing Final Account. xiii) Providing all Test Certificates, etc. Provisional Sum for Contribution to KPLC for power upgrade	Item			
	TOTAL C/F TO NEXT PAGE				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BALANCE B/F FROM PREVIOUS PAGE				
5.14.7	Allow for sub-contractors charges for liaison with Kenya Power and Lighting comprising the following:- i) Extracting load details from the drawings ii) Calculating total load, together with necessary diversity iii) Verifying the details with the engineer. iv) If need be getting the required documentation and letters from client for the purposes of Additional Load Applications v) Filling all the required forms, and generating correspondences for power application. vi) Presenting application and getting reference number. vii) Making regular follow-ups with Kenya Power viii) Facilitating inspection, approvals and certification by Kenya Power ix) Providing attendance and materials required for power connection. x) Filling out and submitting Commencement and Completion certificates xi) Handing over all approved drawings and certificates to the client. xii) Performing all other services required for power supply to site. xiii) Building/m0difying all power manholes to KPLC standards. xiv) All other incidental KPLC requirements/charges.				
	TOTAL FOR GENERAL ITEMS C/F TO SUMMARY PAGE				
	SUMMARY PAGE				
15.1	TOTAT FOR ELEMENT 15.1 HATCHERY				
15.2	TOTAT FOR ELEMENT 15.2 ALGAE PRODUCTION				
15.3	TOTAT FOR ELEMENT 15.3 HEAD OF UNIT OFFICE				
15.4	TOTAT FOR ELEMENT 15.4 POWER HOUSE, R.O. PLANT ROOM, PUMP HOUSES, BATTERY ROOM & GATE HOUSE				
15.5	TOTAT FOR ELEMENT 15.5 POWER DISTRIBUTION				
15.6	TOTAT FOR ELEMENT 15.6 HYBRID SOLAR POWER				
15.7	TOTAT FOR ELEMENT 15.7 GENERATOR				
15.8	TOTAT FOR ELEMENT 15.8 LIGHTNING ARRESTORS				
15.9	TOTAT FOR ELEMENT 15.9 CCTV INSTALLATIONS				
15.10	TOTAT FOR ELEMENT 15.10 ICT INSTALLATIONS				
15.11	TOTAT FOR ELEMENT 15.11 GENERAL ITEMS				
	TOTAL FOR ELECTRICAL INSTALLATIONS CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All rates are V.A.T Inclusive) BILL NO. 16; LANDSCAPING WORKS				
	ELEMNET NO. 16.1 (INTERNAL LANDSCAPING)				
	GROUND PREPARATION AND GRASSING Clearing and Levelling				
16.1.1	Clear the site of all existing unwanted materials and scarify oversite commencing from main Contractor,s reduced levels, average 150 mm deep to allow for water seepage and retention remove all hardened ground, weeds and any deleterious materials; including carting away all arising wastes, raking and fine levelling of the ground.	SM	2,000		
16.1.2	Approved imported red soil filling to receive planters irrespective of size and spread; spread at varying depths as directed by the landscape architect or Project Manager	SM	2,000		
16.1.3	Supply and application of Manure. Supply and apply prime quality fertilizers or compost manure at designated locations and as directed by the landscape architect or Project Manager	SM	2,000		
	Supply and Installation of Grass and Lawns				
16.1.4	Supply, plant, water, weed and tend well undermentioned grass sprigs untill fully established / to reasonable maturity. Grass should also be rolled with a light weight roller to even out 'bumby' areas. This should be carried out one to two weeks after installation Penisetum clandestinum (KIKUYU GRASS) springs spaced at 100mm centres both ways	SM	2,000		
16.1.5	Planting of ground Covers Supply,plant,weed,water and tend well assorted species of groundcovers till full establishment as per the designs of the landscape architect or as directed by the Project Manager	SM	842		
16.1.6	Planting of Shrubs Supply, plant, weed, water and tend well assorted species of Shrubs; till full establishment/reasonable maturity as per the designs of the landscape achitect or as directed by the Project Manager	LM	842		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	INTERNAL LANDSCAPING WORKS CONTINUED…				
	BROUGHT FORWARD FROM PAGE LW/1				
	Supply, plant, weed, water and tend well under-mentioned trees/large shrubs till full establishment/reasonable maturity and support the same with strong bamboo stakes, adequate in thickness for each tree.				
16.1.7	Assorted Species of Palm trees and other ornamental trees as per the designs of the landscape architect or as directed by the project manager	NO	50		
16.1.8	Assorted Species of other indegenous trees as per the designs of the landscape architect or as directed by the project manager.	NO	50		
	MAINTENANCE				
16.1.9	Allow for a follow up of all installations and constructions to insure establishment and concept preservation. Mowing, watering, training and trimming all included	Months	6		
	LITTER BINS				
	Supply, deliver and install litter bins to specification				
16.1.10	Standard round swivel litter bin, 68L Stainless Steel with detailed pattern perforation, inclusive of installations, fixing to concrete footing or any other aprroved by project architect	NO	30		
	TOTAL FOR LANDSCAPING WORKS CARRIED FORWARD TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All prices are V.A.T Inclusive)				
	BILL NO. 17; CIVIL WORKS				
	ELEMENT NO. 17.1 (ROAD WORKS AND PARKING):				
	Excavation and Earthworks				
17.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed by the project manager	SM	748		
17.1.2	Bulk excavation: not exceeding 1.5m deep and cart away or stock pile for re-use as directed by the project manager	CM	524		
	Disposal of excavated material				
17.1.3	Load and cart away surplus material from the site as diected by the project manager.	CM	524		
	Road formation and subbase				
17.1.4	Trim and compact formation to correct levels, cross-falls and longitudinal falls	SM	748		
17.1.5	Provide and lay 300mm thick Imported and approved murram backfill materials to make up levels, well watered, rolled and compacted to 98% MDD at optimum moisture content in 150mm thick Layers to Engineer's approval	SM	748		
17.1.6	Provide, lay and compact 300mm thick approved handpacked stone base blinded to Engineer's specifications or as directed by the Engineer.	CM	525		
	Concrete Paving blocks				
17.1.7	Provide, lay and compact 60mm thick heavy duty interlocking paving blocks min strength 49N/mm2	SM	1747		
	KERBS				
17.1.10	Provide, lay and joint along the edge of the driveways, walkways, round about and parking 125x250mm pre-cast concrete kerb including excavation, 100x225mm bed, 100x350mm haunch (conc calss 20/20) any necessary formwork and disposal of surplus material all to detail (50) 5332 'A.	LM	195		
17.1.11	Provide, lay and joint along the edge of tdriveways, walkways, round about and parking 125x100mm pcc channels, including excavation 350x100mm bed, 350x100mm haunch (conc class 20/20) and any necessary excavation, formwork and disposal of surplus material to detail (50) 5332 'B'.	LM	195		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	CIVIL WORKS CONTINUED... BROUGHT FORWARD FROM PAGE CIV/1 CHANNELS				
	ROAD AND PARKING MARKING Prepare and aplpy three coats of approved road marking thermoplastic paint on asphalt to surfaces not exceeding 100mm girth				
17.1.12	Yellow in colour	SM	36		
17.1.13	White in colour	SM	36		
	TOTAL FOR ELEMENT NO. 17.1 (ROAD WORKS AND PARKING) CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 17.2 (PAVING AROUND BUILDINGS)				
	Excavation and Earthworks				
17.2.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed by the project manager	SM	428		
17.2.2	Excavate oversite average 150mm deep and cart away or stock pile for re-use as directed by the project manager	SM	428		
	Disposal of excavated material				
17.2.3	Load and cart away surplus material from the site as diected by the project manager.	CM	65		
17.2.4	Provide, lay and compact 100mm approved gravel filling to 100% MDD well watered and compacted to 95% MDD and level ready to receive paving slabs	SM	428		
17.2.5	Treat trimmed surfaces with approved herbicide applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	428		
17.2.6	Provide, lay and joint in cement/sand mortar mix (1:3) 600 x 600 x 60mm precast concrete paving slab on 50mm sand or stone dust blinding.	SM	428		
17.2.7	Prepare and apply concrete 100mm wide class 15/20 to edges of Paving slabs lining	LM	1781		
	TOTAL FOR ELEMENT NO. 17.2 (EXTERNAL PAVING) CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 17.3 (STORM WATER DRAINAGE)				
	STORM DRAINED (PIPED)				
17.3.8	Excavate trench for 900mm diameter culvert, backfill after laying of pipes, compact and cart away surplus material average depth 1.5m.	CM	10		
17.3.9	Provide, lay and joint 900mm diameter OG pipe including 100 mm thick concrete bed and surround (class 15/20).	LM	31		
17.3.10	Excavate pit for headwalls, backfill after construction and cart away extra materials.	CM	32		
17.3.11	Provide all material for and construct masonry for 4 no. culverts headwalls.	No.	8		
	INVERT BLOCK DRAIN				
17.3.12	Excavate for 450x225mm external dimensions precast concrete IBD trim sides to slope and cart away excavated material depth not exceeding 1.5m.	CM	200		
17.3.13	Provide, install and joint 450x225mmx600mm external dimensions precast concrete IBD.	LM	121		
17.3.14	Provide and lay 225 x 600 x 50 mm side slabs	SM	145		
	SHALLOW DRAIN AROUND THE BUILDING				
17.3.15	Provide, lay and joint 800 x 500 x 175mm precast concrete Storm Water Channel including 50mm thick concrete bed, class 15, any necessary excavation, formwork and disposal of surplus material to details.	LM	195		
	TOTAL FOR ELEMENT NO. 17.3 (STRORM WATER DRAINAGE) CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 17.4 (FOUL DRAINAGE)				
	FOUL DRAINAGE				
	SEWERLINE				
17.4.1	Excavate trench for 160mmØ UPVC pipe (ISO class 41), backfill after laying of pipes and cart away surplus material as directed be the Engineer. Excavation measured from ground level to a depth n.e. 1.5m.	CM	260		
17.4.2	Ditto depth over 1.5m but n.e 1.75m	CM	31		
17.4.3	Ditto depth over 1.75m but n.e 2.0m	CM	31		
17.4.4	E.O. Excavations in rock	CM	25		
	PIPE LAYING				
17.4.5	Provide, lay and joint 160mm diameter UPVC pipes (ISO class 41) to BS 4660 on gravel bedding and surround as per details	LM	220		
17.4.6	Provide lay and compact granular bed and surround.	CM	72		
17.4.7	Backfill after laying of pipe	CM	300		
17.4.8	Cart away surplus excavated materials	CM	72		
	MANHOLES				
17.4.9	Excavate in pit for rectangular manhole type return fill and ram selected approved material after construction of manholes, depth to invert n.e 1.0M.	CM	25		
17.4.10	Ditto, but rectangular manhole type depth to invert n.e 1.5m.	CM	70		
17.4.11	Ditto, but rectangular manhole type D as per detail drawing depth to invert n.e 2.0m.	CM	15		
17.4.12	Extra over all excavation items for excavation in rock.	CM	5		
17.4.13	Cart away surplus excavations and spread on site 100m away.	CM	30		
	Concrete Class 10				
17.4.14	Provide all materials, mix and place 50mm thick concrete as blinding for manholes.	SM	79		
	Vibrated Concrete Class 15/20				
17.4.15	Ditto but 150mm thick base slab for manholes.	CM	12		
	Vibrated reinforced concrete class 20/20				
17.4.16	Provide all materials, mix and place 150mm thick concrete class 20 as cover for manholes.	CM	12		
17.4.17	Provide all materials; mix place concrete class 20 as benching for 150mm diameter pipe. Include for forming the main and branch channels as well as finishing benching to falls and building in pipes as per detailed drawings.	CM	4		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BROUGHT FORWARD				
	Walling				
17.4.18	Provide, lay and joint 150mm thick approved concrete block or dressed natural coral stone walling to manholes.	SM	115		
	Step Iron				
17.4.19	Provide and fix bitumen coated cast iron steps to B.S 1247 as per detailed drawings.	No.	30		
	Rendering				
17.4.20	Provide 12mm thick water proof cement and sand (mix 1:3) steel float finished rendering to walls.	SM	154		
17.4.21	Ditto but to cover slab	SM	79		
17.4.22	Provide 12mm thick cement and sand (mix 1:1) waterproof rendering trowelled smooth to surface of benching.	SM	79		
	C.I Manhole Cover and Frame To B.S 497 & B.S 556				
17.4.25	Provide and fix 600 x 450mm medium duty C.I manhole cover and frame and grease to detail.	No.	10		
17.4.26	Allow for connecting manholes to the biodigester and testing of the whole foul drainage system in the presence of the Engineer/Project Manager and make good any defects, re-test as necessary and leave the whole system perfect and to the satisfaction of the Engineer/Project Manager.	ITEM	1		
	Biodigester (Builder's Work)				
	Excavate in pit for biodigester tank starting from ground level				
17.4.27	Depth not exceeding (ne)1.5m	CM	73		
17.4.28	Ditto,depth 1.5 - 3.0m	CM	73		
17.4.29	Ditto,depth 3 - 4.5m	CM	12		
17.4.30	Trim bottom of excavated surface	SM	49		
17.4.31	Extra over for excavation in rock class II	CM	158		
17.4.32	Return fill and ram approved excavated material around foundations	CM	100		
17.4.33	Load and cart away surplus excavated material	CM	34		
17.4.34	Allow for keeping the whole excavation free from all water including spring and running water	ITEM	1		
17.4.35	Allow for plunking and strutting the whole excavation	ITEM	1		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BROUGHT FORWARD				
	The following in Concrete class 15/20				
17.4.36	Mix and place 50mm concrete blinding	CM	2		
	Vibrated reinforced concrete class 25/20 in				
17.4.37	150mm thick bottom slab	SM	49		
17.4.38	200X300 mm thicknessing	CM	3		
17.4.39	300mm thick walls	CM	45		
17.4.40	150 mm thick scum baffle wall	CM	1		
17.4.41	200mm thick suspended cover slab	SM	49		
17.4.42	Beams	CM	6		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
17.4.43	Arsorted bars	KG	9,621		
	BRC Mesh Reinforcement to B.S 1483				
17.4.44	BRC mesh No, 65/66	SM	49		
	Formwork				
	Sawn formwork to:-				
17.4.45	Interior sides of vertical walls	SM	150		
17.4.46	External sides of vertical walls	SM	150		
17.4.47	Soffits of suspended slab	SM	49		
17.4.48	Sides of suspended slab, 150 mm-225 mm wide	LM	29		
17.4.49	Ditto to sides of entry and exit manholes	SM	2		
17.4.50	Boxing in formwork to form opening in cover slab for 600 x 450 mm manhole cover and frame, 150 -225 mm wide	NO	8		
	WATER PROOF CEMENT RENDERING				
17.4.51	12mm thick sulphate resistant cement sand (mix 13) to base slab	SM	49		
17.4.52	Ditto to sides of vertical walls	SM	299		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BROUGHT FORWARD FROM PAGE MW/32				
	Sundries				
17.4.53	Form or leave 100mm diameter hole in 200mm thick reinforced concrete wall and slab	NO	7		
17.4.54	Form or leave 600 x 600mm hole in 200mm thick reinforced concrete suspended slab	NO	8		
17.4.55	600 x 600mm heavy duty double sel manhole cover and frame including setting cover in concrete opening and forming rebate	NO	8		
17.4.56	20mm diameter galvanised mild steel step iron 450mm long twice bent and with both ends built 75mm deep into concrete wall	NO	8		
	SOAKPITS				
17.4.57	Excavate all unsuitable soils from soakage area and cart away as directed.	CM	10		
17.4.58	Provide red or similar approved soils and backfill pit and compact as required.	CM	10		
17.4.59	Excavate trench for 160mm Ø Upvc pipes (ISO class 41), backfill and ram after laying of pipes and cart away surplus material to tips as directed by the Engineer. Average depth 2.0m	LM	45		
17.4.60	Excavate pit for 5 No. Circular soak-pit internal Ø 1.2m, backfill after construction and cart away surplus material. Depth, n.e. 6.5m	CM	35		
17.4.61	E.O. for excavation in rock.	CM	20		
17.4.62	Provide all materials for and construct soak pits as per details, include for all reinforcement and any necessary formwork.	No.	5		
	TOTAL FOR ELEMENT NO. 17.4 (FOUL DRAINAGE) CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 17.5				
	TANKS PLINTHS				
	EXCAVATION AND EARTHWORKS				
	Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
17.5.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	60		
17.5.2	Excavate oversite average 150mm deep and cart away	SM	60		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BROUGHT FORWARD				
17.5.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	68		
17.5.4	Extra over excavation from rock in any position	CM	34		
	Disposal of excavated material				
17.5.5	Return, fill and ram extra excavation materials around foundation	CM	33		
17.5.6	Load and cart away surplus material	CM	35		
	Disposal of Water				
17.5.7	Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
	Planking and strutting				
17.5.8	Allow for planking and strutting sides of excavation	Item	1		
	Filling				
17.5.9	250 mm thick approved red soil filling consolidated in 150mm thick layers to make up levels	CM	12		
17.5.10	300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	21		
17.5.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	60		
	Insecticide Treatment				
17.5.12	Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	60		
	CONCRETE WORKS				
17.5.13	50mm thick Mass concrete blinding to surfaces of strip footing & column bases	SM	46		
	Vibrated reinforced concrete class 25/20 to:-				
17.5.14	Strip footing	CM	10		
17.5.15	150mm thick floor slab	SM	60		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
17.5.16	Assorted bars	KG	2,850		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
17.5.17	Edges of strip footing	SM	38		
17.5.18	Ditto but to edges of floor slab 75mm - 150mm thick	LM	36		
	TOTAL CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BROUGHT FORWARD				
	FOUNDATION WALLING				
17.5.19	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	113		
	WATERPROOFING				
17.5.20	1000 gauge polythene DPM	SM	60		
	PLINTH FINISHES				
17.5.21	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	18		
	Painting and Decoration				
17.5.22	Prepare and apply 3 coats of first quality bituminous paint or equal and approved to rendered surfaces	SM	18		
	TOTAL ELEMENT NO. 8.5 (TANKS PLINTHS), CARRIED TO SUMMARY				
	CIVIL WORKS SUMMARRY				
17.1	TOTAL FOR ELEMENT NO 17.1. (ROAD WORKS AND PARKING)				
17.2	TOTAL FOR ELEMENT NO 17.2. (EXTERNAL PAVING)				
17.3	TOTAL FOR ELEMENT NO 17.3. (STORM WATER DRAINAGE)				
17.4	TOTAL FOR ELEMENT NO 17.4. (FOUL DRAINAGE)				
17.4	TOTAL FOR ELEMENT NO 17.5. (TANK PLINTHS)				
	TOTAL FOR CIVIL WORKS CARRIED FORWARD TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 18; OCEAN WATER INTAKE BUILDING WORKS ELEMNET NO 18.1 SUBSTRUCTURE WORKS (All Provisional) Please note that ALL substructure works are Measured Provisionally. The contractor must ensure that the actual measurements are taken by the Project Quantity Surveyor before any works are covered. Failure to do so will necessatate works to be open up for verificatation at your (contractors) cost. NOTE: Classes of Rock (1) Class 1 : Soft rock of the type known locally as "CORAL" which in the opinion of the Engineer cannot be considered as hard rock shall be known as Class 1 rock. Soft Rock shall be rock with compressive strength not exceeding 15N/mm2. Murram and Kunker is specifically excluded and will be reckoned as normal/common excavation. Extremely weathered and weak Tuff shall also be considered as normal excavation. (2) Class 2 : Class 2 Rock shall be with compressive strength exceeding 15N/mm2. This type of rock contains stones and boulders of unweathered or incompletely weathered Tuff, trachyte, black trap or lava with compressive strength exceeding 15N/mm2 in a formation which is massive and geologically homogeneous. A boulder or outcrop with such compressive strength will be deemed to be Class 2 rock or Hard Rock The opinion of the Engineer in classifying rock shall be final and binding. Explosives must not be used without the prior approval of the Engineer. Blasting operations are carried out at the Contractor's sole risk, and all blasting must be carried out in accordance with government regulations and approval Indemnity The contractor shall take full responsibility for piling work and shall guarantee that piling work will support the calculated loads laid down by the engineer without injurious settlement. The actual lengths of piles shall be determined on site by the contractor in consultation with the engineer who will give all assistance possible. This does not in any way relieve the contractor of his responsibility or obligation to provide the specified guarantee				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	EXCAVATION AND EARTHWORKS Excavation including maintaining and supporting sides and keeping free from water, mud and falling materials; No allowance is made in the excavations for working space; contractor to factor in working space in his rates:				
18.1.1	Clear site of all bushes, tufts and any small or large trees, including grubbing out roots and burn on site where directed	SM	24		
18.1.2	Excavate oversite average 150mm deep and cart away	SM	24		
18.1.3	Excavate trench for strip foundation: not exceeding 1.5m deep	CM	27		
18.1.4	Excavate for column bases: not exceeding 1.5m deep	CM	9		
18.1.5	Extra over excavation from rock in any position	CM	36		
18.1.6	Disposal of excavated material Return, fill and ram extra excavation materials around foundation	CM	15		
18.1.7	Load and cart away surplus material	CM	21		
18.1.8	Disposal of Water Allow for keeping the whole of the excavation free from mud, water and fallen materials	Item	1		
18.1.9	Planking and strutting Allow for planking and strutting sides of excavation	Item	1		
18.1.10	Filling 300mm thick (minimum) approved hardcore handpacked in layers not exceeding 150mm	CM	8		
18.1.11	50mm thick murram dust or any other equal and approved material in blinding surface of hardcore	SM	24		
18.1.12	Insecticide Treatment Treat hardcore surface with approved antitermite applied in accordance with the manufacturer's instructions and subject to a TEN YEAR guarantee	SM	24		
	TOTAL EXCAVATION AND EARTHWORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUBSTRUCTURES CONTINUED				
	CONCRETE WORKS				
18.1.13	50mm thick concrete blinding to surfaces of strip footing & column bases (concrete class 15/20)	SM	24		
	Vibrated reinforced concrete class 25/20 to:-				
18.1.14	Strip footing	CM	4		
18.1.15	Columns Bases	CM	3		
18.1.16	Foundation Columns	CM	1		
18.1.17	150 mm thick ground floor slab	SM	24		
18.1.18	Extra over ditto to forming or leaving 400mm wide shallow Cable channels, average 450mm deep 'U' channel in hardcore and floor slab including hand packing to sides of channel, 150mm thick concrete to sides and bed of channel including 50mm blinding and all necessary formwork and reinforcement, all to detail and approval	LM	7		
	High Tensile Ribbed Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
18.1.19	Assorted bars	KG	1,200		
18.1.20	BRC mesh type A142	SM	24		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
18.1.21	Sides of strip footing	SM	15		
18.1.22	Ditto but to column bases	SM	8		
18.1.23	Ditto but to sides of foundation columns	SM	5		
18.1.24	Ditto but to edges of floor slab 150mm - 225mm thick	LM	20		
	FOUNDATION WALLING				
18.1.25	200mm solid coral block foundation wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course	SM	58		
	WATERPROOFING				
18.1.26	1000 gauge polythene DPM	SM	24		
	PLINTH FINISHES				
18.1.27	15mm cement and sand (1:4) render trowelled smooth and comprising 12mm thick backing and 3mm finishing coat.	SM	10		
	Painting and Decoration				
18.1.28	Prepare and apply 3 coats of approved first quality bituminous paint or equal and approved to rendered surfaces	SM	10		
	TOTAL SUBSTRUCTURE WALLING AND CONCRETE WORKS, CARRIED FORWARD TO ELEMENT COLLECTION				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 6.1 (SUBSTRUCTURE WORKS) COLLECTION				
A	Total Excavation and Earthworks brought forward from page OWIBW/2				
B	Total Substructure Walling and Concrete Works brought forward from page OWIBW/3				
	TOTAL ELEMENT NO. 18.1 (SUBSTRUCTURE WORKS), CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUPERSTRUCTURES ELEMENT NO 18.2				
	SUPERSTRUCTURE REINFORCED CONCRETE WORKS				
	Vibrated Reinforced Concrete Class - 25/20 to:-				
18.2.1	Beams	CM	2		
18.2.2	Columns	CM	1		
18.2.3	150 mm Thick Suspended floor slab	SM	24		
	High Tensile Reinforcement Bars to B. S. 4449 including cutting, bending and all necessary spacer blocks : (Provisional) :-				
18.2.4	Asorted bars	KG	1,170		
	Marineply formwork as Described. Allow for setting to special steel proping, strutting, fillets, nails, etc to:				
18.2.5	Sides of Beams	SM	23		
18.2.6	Sides of columns	SM	15		
18.2.7	To soffits of suspended slabs	SM	24		
18.2.8	To Edges of first floor slabs 150-225mm high	LM	20		
	TOTAL FOR ELEMENT NO. 18.2 (SUPERSTRUCTURE REINFORCED CONCRETE WORKS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 18.3 WALLING				
18.3.1	200mm machine cut coral stone wall in cement:sand (1:3) reinforced with hoop iron at every to alternative course (internally and externally)	SM	34		
	WATERPROOFING				
18.3.2	Hessian based bituminous felt damp proof course 200mm wide	LM	16		
	Precast concrete coping				
18.3.3	300 x 50 mm thick insitu concrete coping reinforced in 4No. 10mm diameter bars and 8mm diameter rings; weathered and throated saddled-back on both sides for handling finished fair and jointed to 200 thick dwarf and parapet walls in cement sand mortar 1:3 all to approval	LM	20		
18.3.4	Ditto 550 x 350mm pier cap ditto to columns	NO	4		
	Precast Louvred Concrete Blocks Walling				
18.3.5	200mm thick Precast louvered concrete blocks joint together with cement:sand mortor (1:3) and make good	SM	8		
	TOTAL FOR ELEMENT NO. 18.3 (WALLING), CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 18.4 ROOFING FLAT ROOF FINISHES				
18.4.1	50 mm cement sand 1:3 water proof screed to flat roof slab laid to fall and crossfalls	SM	24		
18.4.2	Apply one coat bituminous primer to surface of screed.	SM	24		
18.4.3	Supply, torch and apply bituminous membrane as per 'high quality' or equal and approved to primed screed surfaces	SM	24		
18.4.4	Ditto sides of wall 200mm high	LM	20		
18.4.5	50 x 50mm internal angle fillet	LM	20		
18.4.6	200 x 200 x 25mm thick high quality clay tiles or equal approved on roof slab bedded and jointed in cement mortar 1:3 and 25mm joint pointed with red cement slurry	SM	24		
18.4.7	Ditto sides of wall 200mm high	LM	20		
	Rainwater goods				
18.4.8	Extra over for running outlet	NO	4		
18.4.9	100mm x 75 x 0.6mm PVC down pipes fixed to wall with holding clips at 1200mm centres	LM	13		
18.4.10	Extra over for swan neck 1000mm long	NO	4		
18.4.11	Extra over for shoe 1000mm long	NO	4		
	TOTAL FOR ELEMENT NO. 18.4 (ROOFING) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 18.5 DOORS Sliding gates Supply, assemble and fix the following Mild/Galvanized Steel sliding gate with louvre vents and all necessary furniture primed with red oxide and finished with three coats of approved first quality matt metal paint as per Archtect's details. The gate should be assembled and fixed to opening including cutting and pinning lugs to concrete or blockwork surround and bedding frame in cement and sand mortar (1:4). (Ref Architects Detailing)				
18.5.1	Overal size 2200mm x 2400mm high	NO	1		
	TOTAL FOR ELEMENT NO. 18.5 (DOORS), CARRIED FORWARD TO SUMMARY				
	ELEMENT NO. 18.6 FINISHES Wall and Concrete Finishes				
18.6.1	12mm cement and sand (1:4) plaster to walls and concrete surfaces trowelled smooth.	SM	68		
18.6.2	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	68		
	Floor Finishes Cement and sand (1:4) screeding smooth trowelled				
18.6.3	32mm Thick floor screed	SM	24		
	Paving slabs				
18.6.4	Supply and fix 50 mm thick precast concrete paving slabs size 600 x 600 mm bedded and pointed in cement and sand mortar.	SM	10		
	Ceiling				
18.6.5	12mm cement and sand (1:4) plaster to concrete surfaces trowelled smooth.	SM	24		
18.6.6	Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces.	SM	24		
	TOTAL FOR ELEMENT NO. 18.6 (FINISHES) CARRIED TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	ELEMENT NO. 18.7 (PIPEWORK ANCHORAGE)				
	Water intake pipe				
18.7.1	Excavate trench for 150mmØ HDPE pipe, backfill after laying of pipes and cart away surplus material as directed be the Engineer. Excavation measured from ground level to a depth n.e. 1.5m.	CM	540		
18.7.2	Ditto depth over 1.5m but n.e 1.75m	CM	90		
18.7.3	Ditto depth over 1.75m but n.e 2.0m	CM	90		
18.7.4	E.O. Excavations in rock	CM	180		
	Backfill and surround				
18.7.5	Provide lay and compact granular bed and surround.	CM	144		
18.7.6	Backfill after laying of pipe	CM	576		
18.7.7	Cart away surplus excavated materials	CM	144		
	Concrete Anchors				
18.7.8	Allow for construction of concrete anchors as per Engineer's details including all materials and necessary formwork; 200 mm thick enclosed anchor channels overall size 1655 x 1400 x 1300 mm high made in class 25/20 waterproofed reiforced concrete to details.	No.	4		
18.7.9	Ditto but precast concrete all round enclosed anchors with through holes for 150 mm diameter pipes to details. Anchors at intervals shown on the details and overall size 1000 x 1000 x 1000 mm.	No.	50		
18.7.10	Allow for construction of a fibre sump overall size 1100 x 1300 x 1000 mm high complete with perforated inlet chamber fibre glass; sump suspended with 4 No. polyethylene ropes fixed to concrete anchors. Allow for making holes for 150 mm diameter pipes.	No.	1		
	TOTAL FOR ELEMENT NO. 18.7 (PIPEWORK ANCHORAGE) CARRIED FORWARD TO SUMMARY BELOW				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	OCEAN WATER INTAKE BUILDING WORKS SUMMARY				
18.1	Total for Element No. 18.1 (Foundation and Piling Works), brought forward from page OWIBW/4				
18.2	Total for Element No. 18.2 (Superstructure Reinforced Concrete Works), brought forward from page OWIBW/5				
18.3	Total for Element No. 18.3 (Walling), brought forward from page OWIBW/5				
18.4	Total for Element No. 18.4 (Roofing) brought forward from page OWIBW/6				
18.5	Total for Element No. 18.5 (Doors) brought forward from page OWIBW/7				
18.6	Total for Element No. 18.6 (Finishes) brought forwardfrom page OWIBW/7				
18.7	Total for Element No. 18.7 (Pipework Anchorage) brought forward from above				
	TOTAL FOR OCEAN WATER INTAKE BUILDING WORKS, CARRIED TO GRAND SUMMARY				

BILL OF QUANTITIES FOR PROPOSED HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE

Item	Description	Unit	Qty	Rate	Amount
	(All Rates are V.A.T Inclusive)				
	BILL NO. 19; DAYWORKS				
	The dayworks rates priced below should include all overheads and profits				
19.1	Provision of labour				
19.1.1	Porter	Hrs	10		
19.1.2	Semi-skilled	Hrs	10		
19.1.3	Mason/	Hrs	10		
19.1.4	Steel fixer	Hrs	10		
19.1.5	Carpenter	Hrs	10		
19.1.6	Painter	Hrs	10		
19.1.7	Tile fixer	Hrs	10		
19.1.8	Welder/Electrician	Hrs	10		
19.1.9	Foreman	Hrs	10		
19.1.10	Carpenter for joinery	Hrs	10		
19.1.11	Plumber	Hrs	10		
19.1.12	Electrician	Hrs	10		
19.2	Provision of plant				
	Any plant to be provided must be in good working condition. The day works rate provided must be inclusive of all running costs and overheads				
19.2.1	Lorry (minimum 8 tonne capacity - or similar)	Hrs	5		
19.2.2	Tipper (8 tonne capacity - or similar)	Hrs	5		
19.2.3	Compressor	Hrs	5		
19.2.4	Roller	Hrs	5		
19.2.5	Plate compactor	Hrs	5		
19.2.6	Wheel loader	Hrs	5		
19.2.7	Grader	Hrs	5		
19.2.8	Crawl loader	Hrs	5		
19.2.9	Jack hammer	Hrs	5		
19.2.10	Dewatering pump	Hrs	5		
19.2.11	Concrete mixer	Hrs	5		
19.2.12	Dumper	Hrs	5		
19.2.13	Hand tools (power drills, grinders, torque wrenches, etc.)	Hrs	5		
19.2.14	Excavator	Hrs	5		
19.2.15	Bulldozer	Hrs	5		
19.2.16	Motor grade	Hrs	5		
19.2.17	Portable generator	Hrs	5		
19.2.18	3-Phase power generator	Hrs	5		
19.2.19	Vibrator	Hrs	5		
	Total Carried to Summary				

BILL OF QUANTITIES FOR PROPOSED HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE

Item	Description	Unit	Qty	Rate	Amount
19.3	Provision of material Any materials to be provided must be of good quality and upto standard for use in permanent works. The rate provided must be inclusive of all delivery costs and overheads				
19.3.1	Ordinary portland cement @ 50kg bags	Bags	10		
19.3.2	Clean river sand	m3	10		
19.3.3	12-20mm graded course aggregate	m3	10		
19.3.4	Manufactured sand / Quarry dust / 0-6mm aggregate	m3	10		
19.3.5	Graded crushed stone (crusher run - 0 to 60mm)	m3	10		
19.3.6	Murram	m3	10		
19.3.7	Hardcore	m3	10		
19.3.8	Redsoil	m3	10		
19.3.9	Reinforcement steel	Kg	100		
19.3.10	Sawn timber formwork	m2	10		
19.3.11	6mm thick clear glass	m2	10		
19.3.12	Water	lts	100		
19.3.13	Diesel fuel	lts	10		
	Total Carried to Summary Below				
	DAYWORKS SUMMARY				
A	Total Brought Forward from page DW/1				
B	Total Brought Forward from above				
	TOTAL FOR DAY WORKS CARRIED TO GRAND SUMMARY				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	(All Rates are V.A.T Inclusive) BILL NO. 10; ESMP PRELIMINARIES FOR HEALTH AND SAFETY, AIR AND NOISE MONITORING & CONTROL, WASTE MANAGEMENT The Tenderer's attention is drawn to the fact that the Employer reserves the right to hold back the amount priced against below items either in full or in part due to any non-performance on the Contractor's part of his obligations. The Contractor will be required to monitor, keep records and report on the following environmental and social issues for the project in manner acceptable to the World Bank and Government of Kenya: SAFETY, HEALTH AND WELFARE OF WORKERS				
10.0.1	The Contractor shall allow for providing for the safety, health and welfare of work people and for complying with any relevant Ordinances, Regulations or Union Agreement In addition to complying with the requirements of the Occupational Safety & Health Act 2007 and the Factories Act, the Contractor and Sub-Contractors shall be required to comply in all respects with the Factories (Building Operations and Work of Engineering Construction) rules together with the Construction Safety Plan in compliance with International Labour Organizations (ILO) Regulations. The Contractor will further be required to identify a Site Environment Health and Safety Officer in accordance with the above Rules who will be responsible for the health and safety of workers on the site. This includes awareness and sensitization on environmental protection, occupational and community health and safety, code of conduct for contractors personnel, risk of spread of communicable diseases including sexually transmitted diseases such as HIV/AIDS, Gender Equity, Sexual Harassment and abuse amongst workers in the workplace,Spread of COVID-19 amongst community members during the consultation processes and Grievance redress mechanism. The Contractor will also be required to provide approved personal protective equipment such as good quality hard hats, gumboots, safety boots and other necessary protective gear for all workers on site including Sub-Contractors' workers and also for the exclusive use by the Clerk of Works and representatives of the Employer and Consultants. The tenderer's attention is further drawn to the fact that he is required to submit with his tender a detailed write-up on how he intends to implement the above Construction Safety Plan. It should be noted that this write-up will form a heavily weighted criteria in the evaluation of the tenders. The Contractor is expected to also come up with an Emergency Response plan	Item	1	2,500,000.00	2,500,000.00
	Total Carried to Collection			Ksh	2,500,000.00

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	The contractor will be required to provide adequate temporary Notices and Signs shall be posted to indicate e.g. that "construction is in progress" and "entry is at ones own risk" or "trespassers are liable to be prosecuted" or such other Notices and Signs as the Architect may consider necessary from time to time. The design and location of such signs will be to the approval of the Architect.				
10.0.2	SANITATION OF THE WORKS The sanitation of the works shall be provided, maintained and removed on completion of works by the Contractor to the satisfaction of the Architects, health department and local Authorities. The sanitation facilities should be gender sensitive (separate for male and female)shall be for the use by Contractors and sub-Contractors workmen etc without charge. The Latrine/toilet shall be enclosed plastered and painted masonry wall, corrugated sheets roofs ,with concrete tiled floors to facilitate washing. Their location shall be agreed with the Architects and the works shall not be commenced before the sanitary accommodation has been approved by the above mentioned authorities. The Contractor will be required to pay all conservancy charges and shall ensure clean daily maintenance and disinfecting of the latrines/toilet, and not less than once per week, the whole area shall be sprayed with disinfectant and insecticides and any temporary drains shall be removed and all works and surfaces disturbed made good and then the whole area disinfected and left clean and free from pollution to the satisfaction of the Architect and local authorities.	Item	1	700,000.00	700,000.00
10.0.3	PREVENTION OF DISTURBANCE AND NUISANCE Tenderers should note that normal activities shall be continuing in the surrounding buildings during the construction period. Minimum disturbance by noise, dust, water or movement of vehicles, materials, labour or plant must be caused to the function of the existing adjacent buildings in the vicinity and the occupants and staff therein. The Contractor shall comply with all instructions issued by the Employer or Architect with regard to minimizing such disturbances. The Contractor shall not directly or indirectly or otherwise by himself or through his agents cause nuisance. Should he do so he shall be directly responsible for such acts. The works and such sections of the site necessary shall be under the entire care and control of the contractor during the whole period of the contract and shall take all possible precautions to prevent any nuisance, inconvenience or injury to the holder 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.	Item	1	500,000.00	500,000.00
	Total Carried to Collection			Ksh	1,200,000.00

BILL OF QUANTITIES FOR PROPOSED HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE (ALL PROVISIONAL)

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.0.4	GRIEVANCE REDRESS MECHANISM (GRM) WORKER The Contractor shall employ, maintain and equip throughout the project duration staff assigned the functions for GRM and the implementation of social safeguard issues.	Item	1	840,000.00	840,000.00
10.0.5	CLEANING, REMOVAL OF PLANT AND RUBBISH AND GENERAL WASTE MANAGEMENT ETC The Contractor shall upon completion of the works remove and clear away all temporary buildings, scaffolding, plant, rubbish and unused materials,surplus excavated materials and shall leave the whole of the site of the works in a clean and tidy state to the satisfaction of the Architect, including clearing away and making good all traces of dirt. The contractor will come up with a Solid and liquid Waste Management and handling Plan to guide and manage the collection and disposal of solid/liquid waste at the site. Particular care shall be taken in leaving windows, floors and fittings clean and the removal of all paint and cement stains therefrom. He shall also remove all rubbish and dirt from the site as it accumulates or as directed by the Architect. The Contractor is to find his own dump and shall pay all charges in connection therewith.	Item	1	700,000.00	700,000.00
10.0.6	AMBIENT AIR QUALITY AND NOISE MONITORING The Contractor to carry out continuous monitoring of the ambient air quality and Noise measurements as well as vibration monitoring on quarterly basis during the construction phase and this should be done at different weather and seasons to ensure that all the weather patterns are taken into consideration during the monitoring process.	Item	1	700,000.00	700,000.00
10.0.7	TRAFFIC CONTROL AND MANAGEMENT It will be necessary for the Contractor to provide safety road signage on busy roads around the construction site, temporarily during the construction period. The contractor should arrange diversions for providing alternative route for transport. After breaking up, closing or otherwise interfering with any street or footpath to which the public has access, the Contractor shall make such arrangements as may be reasonably necessary so as to cause as little interference with the traffic in that entrance road or footpath during construction as shall be reasonably practicable. The Contractor will also come up with a Traffic Management Plan to ensure safety of local communities from construction traffic	Item	1	850,000.00	850,000.00
	Total Carried to Collection			Ksh	3,090,000.00

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10.0.8	MOVEMENT OF TRUCKS OR MACHINERY The Contractor moving solid or liquid construction materials and waste shall take strict measures to minimize littering of roads by ensuring that vehicles are licensed and loaded in such a manner as to prevent falling off or spilling of construction materials and by sheeting the sides and tops of all vehicles carrying mud, sand, other materials and debris. Construction materials should be brought from registered/approved sources in the city or from the city and debris should be transferred to assigned places in the landfill with documented confirmation.	Item	1	500,000.00	500,000.00
10.0.9	PROTECTION OF EXISTING INSTALLATION The Contractor shall take all necessary measures required for the support and protect structures, pipes, cables, sewers and other apparatus during the construction period, and to repair any damage occurs in coordination with local resident association, Government and any concerned authorities.	Item	1	200,000.00	200,000.00
10.0.10	PHYSICAL, CULTURAL & NATURAL RESOURCES The contractor will train construction crews and supervisors to spot potential archaeological finds. In the event of a potential find, the contractor will inform the implementing partner who will in turn liaise with the archaeological department at the Ministry of Culture, and Social Services or a local university for quick assessment and action. Clear record keeping and expert verification procedures, criteria for temporary work stoppages that may be required to allow for rapid resolution of issues in the field and the chain of custody must be clear from the onset. The Contractor will come up with a Water Resource Protection Plan to prevent contamination of drinking water	Item	1	300,000.00	300,000.00
	Total Carried to Collection below			Ksh	1,000,000.00
	SECTION SUMMARY- ESMP				
	Total Brought Forward from Page ESMP/1				2,500,000.00
	Total Brought Forward from Page ESMP/2				1,200,000.00
	Total Brought Forward from Page ESMP/3				3,090,000.00
	Total Brought Forward from Page above				1,000,000.00
	TOTAL FOR DAY WORKS CARRIED TO GRAND SUMMARY				7,790,000.00

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	(All prices are V.A.T Inclusive) BILL NO. 21 CSR (PAINTING A LOCAL SCHOOL) ELEMENT NO. 21.1 (FINISHES): FINISHES Wall and Concrete Finishes				
21.1.1	Supply labour to remove old paint and Prepare and apply 3 coats of first quality emulsion paint or equal and approved to plastered surfaces of primary classrooms identified for C.S.R Activity.	2,360	SM		
	TOTAL FOR CSR CARRIED FORWARD TO GRAND SUMMARY				

BILL OF QUANTITIES FOR PROPOSED HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE (ALL PROVISIONAL)

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	(All Rates are V.A.T Inclusive)				
	BILL NO. 22; PRIME COST AND PROVISIONAL SUMS				
22.0.1	Allow a Provisional Sum of Kshs. Seventeen Million (17,000,000.00) only for Contingencies to be used upon approval by Project Engineer				17,000,000.00
22.0.2	Allow a Provisional Sum of Kshs. Fifteen Million Thousand (15,000,000.00) only for Fluctuations to be used upon approval by Engineer.				15,000,000.00
	TOTAL PRIME COST AND PROVISIONAL SUMS, CARRIED TO GRAND SUMMARY				32,000,000.00

BILL OF QUANTITIES FOR PROPOSED HATCHERY AT NATIONAL MARICULTURE RESEARCH AND TRAINING CENTRE

ITEM	DESCRIPTION	AMOUNT
	(All Rates are V.A.T Inclusive)	
	BILL NO. 23; GRAND SUMMARY	
23.1	Total Amount for Particular Preliminaries brought forward from Page PP/7	
23.2	Total Amount for General Preliminaries brought forward from Page GP/13	
23.3	Total Amount for 2No. Hatchery building Works brought forward from Page HABW/9	
23.4	Total Amount for Algae Production building Works brought forward from Page APBW/11	
23.5	Total Amount for 3No. Washroom Blocks Building Works brought forward from Page WBW/10	
23.6	Total Amount for Power House Building Works brought forward from Page PHBW/6	
23.7	Total Amount for Reverse Osmosis Room Building Works brought forward from Page ROBW/8	
23.8	Total Amount for Pump Room Building Works brought forward from Page PRBW/8	
23.9	Total Amount for 2No. Storage Tanks Building Works brought forward from Page STBW/4	
23.10	Total Amount for 2 No. Trial Tanks Building Works brought forward from Page TTBW/4	
23.11	Total Amount for WetLand Building Works brought forward from Page WTBW/4	
23.12	Total Amount for Battery Room Building Works brought forward from Page BRBW/8	
23.13	Total Amount for Mechanical Works brought forward from Page MW/26	
23.14	Total Amount for Electrical Installations brought forward from Page EW/20	
	TOTAL CARRIED FORWARD	

ITEM	DESCRIPTION	AMOUNT
	GRAND SUMMARY CONTINUED…	
	BROUGHT FORWARD GS/1	
23.15	Total Amount for Landscaping Works brought forward from Page LW/2	
23.16	Total Amount for Civil Works brought forward from Page CW/9	
23.17	Total Amount for Ocean Water Intake Building Works brought forward from Page OWIBW/9	
23.18	Total Amount for Day Works brought forward from Page DW/2	
23.19	Total Amount for ESMP brought forward from Page ESMP/4	7,790,000.00
23.20	Total Amount for CSR brought forward from Page CSR/1	
23.21	Total Amount for Prime Cost and Provision Sums brought forward from Page PS/1	32,000,000.00
	TOTAL AMOUNT FOR GRAND SUMMARY CARRIED TO FORM OF TENDER	39,790,000.00
	SIGNATURE AND STAMP OF TENDERER	
	DATE	
	NAME AND ADDRESS	
	TENDERER'S WITNESS SIGNATURE	
	DATE	
	NAME AND ADDRESS	

21. GRAND SUMMARY

Contract Name: CONSTRUCTION OF NAMARET HATCHERY

RFBNo.: KE-MOMBE&MA-KWL-2024-004-CW

General Summary		*Page*	*Amount*
BILL NO. 1: PARTICULAR PRELIMINARIES		PP/7	
BILL NO. 2: GENERAL PRELIMINARIES		GP/13	
BILL No.3	2No. Hatchery building Works	HABW/9	
BILL No.4	Algae Production building Works	APBW/11	
BILL No.5	3No. Washroom Blocks Building Works	WBW/10	
BILL No.6	Power House Building Works	PHBW/6	
BILL No.7	Reverse Osmosis Room Building Works	ROBW/8	
BILL No.8	Pump Room Building Works	PRBW/8	
BILL No.9	2No. Storage Tanks Building Works	STBW/4	
BILL No.10	2 No. Trial Tanks Building Works	TTBW/4	
BILL No.11	WetLand Building Works	WTBW/4	
BILL No.12	Battery Room Building Works	BRBW/8	
BILL No.14	Mechanical Works	MW/26	
BILL No.15	Electrical Installations	EW/20	
BILL No.16	Landscaping Works	LW/2	
BILL No.17	Civil Works	CW/9	
BILL No.18	Ocean Water Intake Building Works	OWIBW/9	
BILL No.19	Day Works	DW/2	
BILL No.10	ESMP	ESMP/4	
BILL No.21	CSR	CSR/1	
Subtotal of Bills		*(A)*	
*Total for Daywork (Provisional Sum)**		*(B)*	
Provisional Sum of Kenya Shillings Fiftteen Million Only (Kes 15,000,000.00) for fluctuations[ii]		*(C)*	*15,000,000.00*
Total of Bills Plus Provisional Sums (A + B + C)[i]		*(D)*	
Add Provisional Sum of Kenya Shillings Seventeen Million Only (Kes 17,000,000.00) for Contingency Allowance[ii]		*(E)*	*17,000,000.00*
Bid Price (D + E) (Carried forward to Letter of Bid)		*(F)*	

i) All Provisional Sums are to be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clauses 13.4 and 13.5 of the General Conditions except with respect to DAAB Fees and Expenses for which Sub-Clause 13.4 of the Particular Conditions – Part B shall apply.

ii) To be entered by the Employer.* For evaluation purposes, Provisional Sum, other than Daywork will be excluded