

When replying please quote: AWWDA/NaRSIP II/W-04/2021 PE-so

22nd June 2022

To all Bidders:

**NAIROBI RIVERS BASIN REHABILITATION AND RESTORATION PROGRAM:
SEWERAGE IMPROVEMENT PROJECT PHASE II: LOT 1- CONSTRUCTION OF
DANDORA ESTATE WASTEWATER TREATMENT PLANT (DEWWTP)
REHABILITATION AND DUPLICATION PLANT INLET WORKS ICB No:
AWWDA/NaRSIP II/W-01/2022**

**REF: RESPONSES TO CLARIFICATIONS AND ADDENDUM No. 1 TO THE
ADVERTISED BID**

Reference is made to the ongoing procurement of works for the Construction of Dandora Estate Wastewater Treatment Plant (DEWWTP) Rehabilitation and Duplication Plant Inlet Works ICB No: AWWDA/NaRSIP II/W-01/2022

Pursuant to clause No.7 of the Instructions to Bidders, please find attached responses to clarifications as received by AWWDA.

All bidders are further notified that the deadline for submitting bids has been extended from 5th July 2022 to 19th July 2022 at **12.00 pm East African Time.**

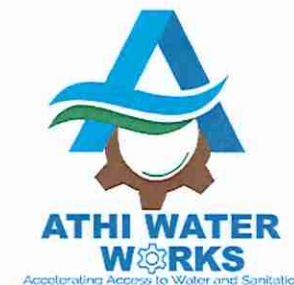
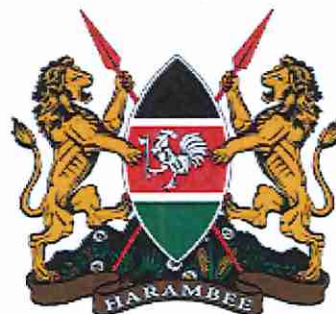


ENG.MICHAEL M. THUITA
CHIEF EXECUTIVE OFFICER.

Encl.

1. Addendum No 1 – Revised Bills of Quantities
2. Responses to Clarifications sought by Bidders (Including Annex 1 and Annex 2)

ATHI WATER WORKS DEVELOPMENT AGENCY



PROGRAMME: NAIROBI RIVERS BASIN REHABILITATION AND RESTORATION PROGRAM -SEWERAGE IMPROVEMENT PROJECT, PHASE II

CLARIFICATIONS NO.1 TO THE ADVERTISED BID FOR PROCUREMENT OF WORKS FOR LOT 1-CONSTRUCTION OF DANDORA ESTATE WASTEWATER TREATMENT PLANT (DEWWTP) REHABILITATION AND DUPLICATION PLANT INLET WORKS OCBI No: AWWDA/NaRSIP II/W-01/2022

	QUERY	AWWDA'S RESPONSE
1.	<p>With regard to the BOQ ITEM A.420.5, manager from Contractor are required to run and maintain the plant including training of staff for 1 year;</p> <ol style="list-style-type: none"> 1) Is there any requirements on the nationality and qualification of the contractor's personnel for plant operation and maintenance? 2) Could this ITEM A420.5 be detailed? Will the price of this item cover all the costs incurred by the attendance of the Contractor's manager, such as the salary, benefits, accommodation expenses, commuting cost? 	<ol style="list-style-type: none"> 1) There is no requirement on the nationality of the Contractor's personnel but the proposed personnel must be proficient in English. Knowledge of Kiswahili will be an added advantage. The staff are expected to have reasonable prior experience in their specific roles. 2) The cost quoted by the Contractor should cater for full attendance of their staff during operation and maintenance of the works. The Contractor will be expected to work and train the operator staff at the same time. This will cover operation and

SIGNED: Name Eng. Samuel Odhiambo Sign [Signature] 1 of 3

	QUERY	AWWDA'S RESPONSE
		maintenance in year 1 and in year 2 they are expected to only do maintenance and still be training the staff further on maintenance. (Contractors should see Particular Specifications attached in Annex 1 overleaf for further details)
2.	With regard to the BOQ No.1 Item E31 & E33 where the top soil, as well as the rock, is requested to be disposed within the DESTP site, would the layout and size of the disposal site be provided?	The disposal site will be within the DESTP.
3.	<p>For the lump sum BOQ Item X903.1 where the grit and debris are requested to be disposed,</p> <p>1) Would the quantity of the debris and grit be indicated or estimated?</p> <p>2) Would the length of the channel to be de-sludged be indicated?</p>	<p>1) See revised BOQ addendum No 1</p> <p>2) Additionally, Contractors are required to provide a methodology for this item.</p>
4.	For the BOQ Item X903.2 where the desludging is requested to be carried out in coordination with NCWSC DESTP staff, please clarify the site for sludge disposal.	The disposal site will be within DESTP
5.	<p>For the BOQ Item X903.3 where the de-silting of Nairobi Trunk Sewer is requested</p> <p>1) please provide the layout of the Nairobi Trunk Sewer</p> <p>2) Whether the pipes, the chambers or the covers in bad condition need to be changed? If it is required, how the cost can be reimbursed?</p>	See the Revised BOQ addendum No 1 and quote as per the provided details
6.	<p>With Regard to the BOQ Item X500.1,</p> <p>1) Please clarify your requirements on the ceiling</p> <p>2) According to the drawings, there are furniture and other facilities included. Whether all the items indicated in the drawing need to be provided or installed?</p>	See revised BOQ in addendum No 1 for further details.

SIGNED: Name.....

Eng. Samuel Ochieng

Sign.....



	QUERY	AWWDA'S RESPONSE
	3) Please clarify your requirements on the floor finishing works? Whether the floor tile is needed? If so, please give detailed specification.	
7.	The items A211.3, A221.2, A231.2, A250.2 in bill of quantities whether it should be a percentage instead of an amount.	The rate is to be a percentage that will then be used to calculate the amount.
8.	Please let us know the specific requirements of item X903.2 in bill of quantities.	See revised BOQ in addendum No 1 for further details.
9.	According to the form on page 60 of the bidding document, whether the 'Total Work Similar Experience (years)' should be changed to 'Total work Experience (years)'.	Yes The Column 'Total Work Similar Experience (years)' in the table on page 60 has been revised to read Total Work Experience (Years)
10.	Specifications for the supply of the tipper dump truck are provided in Annex 2 overleaf.	

SIGNED: Name..... Eng. Samuel Odhiambo Sign..... [Signature] 3 of 3

Annex 1 - Particular Specifications for Operation and Maintenance Contract

During the condition assessment it was determined that one of the major weaknesses of the installation was inadequate maintenance of the equipment. To this end it was decided that an operation and maintenance Contract be included in this Contract to ensure the following.

- a. that the plant receives best operation and maintenance for the first two years to serve as a yardstick.
- b. The period be used by the Contractor to train the staff on hands-on operation and maintenance of the plant and examine them to ensure at the end of the period, they are up to date with world class operation and maintenance practices.
- c. If necessary, recommend recruitment of additional qualified staff to ensure the plant lasts the recommended lifespan
- d. Give any other recommendation to the utility to ensure the lifespan is achieved.
- e. Develop detailed Standard Operational Procedures and manuals

Required Staff

The following staff will be required to be deployed

Position	Quantity	Minimum Qualification	Experience
Plant Manager	1	Bsc. Civil Engineering, Registered Professional Engineer by EBK or equivalent	10 years Relevant
Electrical Engineer	1	Bsc. Electrical Engineering Registered Professional Engineer by EBK or equivalent	6 Years Relevant
Mechanical Engineer	1	Bsc. Mechanical Engineering Registered Professional Engineer by EBK or equivalent	6 Years Relevant
Electrician	1	Diploma Electrical Engineering Power Option	10 years Relevant
Instruments Technician	1	Diploma Instruments Engineering	10 years Relevant
Mechanical Technicians	2	Diploma Mechanical Engineering	10 years Relevant
Logistics Manager	1	Bachelor of Arts or Bachelor of Commerce	3 Years Relevant
Operations Manager	1	Bachelor of Science in Engineering (Either Mechanical or Electrical)	6 Years Relevant Knowledge in operating similar plant

All qualifications must be from institutions recognized in Kenya.

Key Performance Objectives

- a. Plant Availability; - Ensure plant is available and in operation 95% of the time.

80
102

- b. Safety - Ensure zero tolerance to accidents and staff training on first aid, firefighting, and environment rules by reputable organizations among others.
- c. Technical Training for Staff on Operation and Maintenance of Wastewater Treatment Plant. Minimum Training.
- d. Evaluation of Staff to Ensure Seriousness in Learning.
- e. Maintenance of Records to Show Quality of Treatment at the end of every month. Must not vary from WHO standards by more than 4%.
- f. Energy Consumption Reduction Strategies - Take energy consumption at commissioning and must device measures for reducing the same by 5% every year.
- g. Solid Waste Management – Ensure proper solid waste management and sludge management in the plant
- h. Ensure the plant operates strictly as a business enterprise.

To ensure that these are achieved, the Contractor shall submit a quarterly report to the Engineer clearly outlining progress made in the above areas and the status of the operations and maintenance. The report shall include

- i. the overview of the plant status,
- ii. Any services due at the plant
- iii. any spares ordered and delivered
- iv. Corrective, preventive maintenance done in the period under review
- v. Root cause analysis of any problems encountered
- vi. Opportunities for energy saving realised
- vii. Trainings performed
- viii. Environmental Health and Safety report for both Staff and Plant.

500

2. of 2

ANNEX 2 - T1.0 PARTICULARS TIPPER DUMP TRUCK

PARTICULARS

SCHEDULE OF REQUIREMENTS

Schedule A: Schedule of Equipment/vehicles Specifications and Requirements

LOTS	SPECIFICATION		
LOT 1	NCWSC-0056-06-22	TIPPER (DUMP TRUCK), 4X2, 6-8 TON,	1
TOTAL			

1 of 5
5.0

TECHNICAL SPECIFICATIONS

RQ/NCWSC /0056

SPECIFICATION NO. NCWSC-0056-06-22

TENDER'S NAME:

NO:

TENDER NO:

ITEM NO:

QTY:

DESCRIPTION: MEDIUM TIPPER (DUMP TRUCK), 4X2,6-8 TON

TENDERER'S Column to be completed by ALL TENDERERS

SPECIFICATION	REQUIREMENT	TENDERER'S REMARKS
---------------	-------------	-----------------------

A. CAB-CHASSIS.

MAKE	-	-----
MODEL	Yes	-----
COUNTRY OF ORIGIN	-	-----
MANUFACTURER'S LITERATURE, AUTHORITY AND SPECIFICATIONS SUPPLIED (IN ORIGINAL FORM)	Yes mandatory	_____(Y/N)
ENGINEERING DRAWING OF THE TIPPER	Yes	_____(Y/N)
PROVIDED	mandatory	-----

1. GENERAL

a) A standard production, 4x2, 6-8 ton payload tipper truck, of latest design, robust construction,in current production, marketed in Kenya.	Yes, Yes, Yes	----- (Yes/No)
--	---------------	-------------------

b)	Supplied new.	Yes	----- (Yes/No)
c)	Designed to heavy duty export specifications, capable of operating in tropical conditions overpaved and unpaved roads.	Yes, Yes, Yes	----- (Yes/No)
d)	Suitable for cargo transportation.	Yes	----- (Yes/No)
e)	Control Forward, right hand drive	Yes	----- (Yes/No)

2. DIMENSIONS AND WEIGHTS

a)	Overall length, approx.	5,900mm	-----mm
b)	Overall width, approx.	1,880mm	-----mm
c)	Overall height approx.	2,200mm	-----mm
d)	Wheelbase, approx.	3,360mm	-----mm
e)	Length of chassis aft of cab, approx.	5,000mm	-----mm
f)	Kerb weight approx.	2,950Kg	-----kg
g)	G.V.W approx.	17,000Kg	-----kg
h)	Payload .mandatory	6,000-8,000Kg	-----kg

2.955
5.0

i)	Permissible/legal front (steering) axle load, max.	2,500Kg	-----kg
j)	Permissible/legal rear (for dual wheels) axle load,max.	4,800kg	-----kg
k)	Turning radius, approx.	5,800mm	-----mm

3. ENGINE

a)	Make	Yes	----- --
b)	Model	Yes	----- -
c)	Country of origin	Yes	----- -
d)	Engine performance curves supplied.	Yes	----- (Yes/No)
e)	Diesel Engine, water cooled, 4 Stroke.	Yes, Yes, Yes	----- (Yes/No)
f)	Mode of aspiration. (Turbocharged)	Yes mandatory	----- (Yes/No)
g)	Piston displacement, approx.	2,999 cc	-----cc
h)	Number of cylinders, min.	4	-----no.
i)	Maximum power output / rpm, min. Mandatory	120HP/2900rpm	----- HP/rpm
j)	Maximum torque developed /rpm, min. mandatory.	388nm/2800rpm	----- Nm/rpm
k)	Air cleaner type, disposable/ oilbath.	Specify	----- --

l) Oil and fuel filter type	Disposable	----- --
m) Average fuel consumption (on full load)	Specify	-----km/l
n) Fuel tank capacity min. mandatory	75Lt	-----Lt
o) Extra fuel tank fitted Capacity	Yes Specify	----- (Yes/No) -----Lt

4. CLUTCH AND TRANSMISSION

a) Clutch, dry type, single plate	Yes, Yes	----- (Yes/No)
b) Clutch, system actuation, Hydraulic	Yes	----- (Yes/No)
c) Gearbox, synchromesh.	Yes	----- (Yes/No)
d) Number of speeds, min. mandatory	5F, 1R	-----F/--- R
e) Drive configuration, mandatory.	4x2	----- x--- ----

5. BRAKES, TYRES AND SUSPENSION.

a) Brakes, hydraulic-pneumatic assisted.	Yes	----- (Yes/No)
b) Mechanical parking brake to act on transmission.	Yes	----- (Yes/No)
c) Rear tyres.	Dual	----- ----
d) Tires size locally available.	Yes	-----

50

3.085

		(Yes/No)
e) Tyres to be premium, suitable for the rough terrain of the county and heavy loading involved	Yes mandatory	_____(Y/N)
f) Optimum tire size and brand	6.50-16 nylon tire	
g) Suspension, front and rear heavy duty leaf springs with telescopic shock absorbers at front.	Yes, Yes	_____ (Yes/No)
h) With exhaust brake	Yes mandatory	_____(Y/N)

6. STEERING, TIPPING SYSTEM, CONTROL AND CAB.

a) Right Hand drive steering	Mandatory	(Y/N)
b) Steering Type.	Assisted	
c) All steel, spacious cab to seat 2 passengers comfortably.	Yes, Yes	(Y/N)
d) Adjustable driver's seat.	Yes	(Y/N)
e) Seat belts to conform to KEBS 06-664:1985 STANDARD.	Yes Mandatory	(Y/N)
f) Heavy duty tipping sub-frame mounted on chassis.	Yes	(Y/N)
g) Complete tipping gear including mounted single ram, PTO pump and cab mounted controls, hydraulic oil system and piping all assembled, tested and ready to operate on the tipper body.	Yes	(Y/N)

7. ELECTRICAL SYSTEM AND INSTRUMENTS

a) System voltage, negative earth.	24V, Yes	-----
------------------------------------	----------	-------

		(Yes/No)
b) Battery capacity and size.	24V	-----AH
c) Full lighting to conform to Cap 403 Subs.23-KenyaTraffic Act.	Yes	----- (Yes/No)
d) Standard instruments, gauges and warning lights for charging circuit, oil pressure, coolant temperature etc.	Yes	----- (Yes/No)

8. EQUIPMENT ETC.

a) Heavy duty type front fender.	Yes	----- (Yes/No)
b) Laminated (safety) windshield.	Yes	----- (Yes/No)
c) Sunvisors supplied.	Yes	----- (Yes/No)
d) Rear view mirrors (external both sides and internal)supplied.	Yes	----- (Yes/No)
e) Full size spare tyre with rim and carrier mounted undertruck.	Yes	----- (Yes/No)
f) Hydraulic (telescopic) jack, wheel brace and manufacturer's standard tools, supplied.	Yes, Yes, Yes	----- (Yes/No)
g) Vehicle to be fitted with electronic speed governor	Mandatory	----- (Yes/No)
h) Governor to limit maximum speed to 80km/hr	Mandatory	----- (Yes/No)
i) Governor to be tamper proof	Mandatory	----- (Yes/No)

5.0
4 of 5

j)	Governor to be inspected by CM&TE before delivery of the truck.	Mandatory	(Yes/No)
g)	Any other equipment (or accessories) supplied.	specify	----- ----- -----

B. DUMP.

Make	-	
Model	-	
Country of origin.	-	
Manufacturer's literature, authority and specificationssupplied.	Yes mandatory	(Y/N)

9. GENERAL

a)	Vehicle supplier to build body or sub-contract to areputable body builder	specify	----- ----- -----
b)	If the work is sub-contracted, name sub-contractor.	specify sub-contractor	----- ----- -----
c)	An all steel fabricated cargo body, suitable of transporting and tipping general cargo over paved andunpaved (rough) roads.	Yes, Yes, Yes	----- (Y/N)
d)	All body construction and fitments to comply withKenya Traffic Act, Cap 403.	Yes	----- (Y/N)
e)	All body construction and installations to comply withthe chassis manufacturer's specifications.	Yes	----- (Y/N)

10. BODY DIMENSIONS.

a) Overall length, approx.	3,600 mm	----- mm
b) Height of sides.	600 mm	----- mm
c) Internal width, minimum mandatory.	2,200 mm	----- mm

11. BODY CONSTRUCTION.

a) Flanged cross bearers of pre-stressed channel sections,min. 4mm thickness equidistantly spaced at a maximum of 350mm apart.	Yes	----- (Y/N)
b) Fixed head board clear of cab.	Yes	----- (Y/N)
c) Body floor fabricated from 4.0-6.0mm, sides and tailgate fabricated from 3.2mm thick mild steel plate(full width) reinforced at equal distances with top hat /channel/angle sections.	Yes	----- (Y/N)
e) Fixed headboard clear of cab.	Yes	----- (Y/N)
f) Drop tailgate suitably reinforced and to be easily removable i.e. when unloading /loading a roller	Yes mandatory	----- (Y/N)
g) Fixed sides in two sections.	Yes	----- (Y/N)
h) Spare wheel carrier fitted.	Yes	----- (Y/N)
i) Suitable size tool box to be fitted under body on the leftside.	Yes	----- (Y/N)

5.0

5.25

j)	Suitable size rear mudguards fitted.	Yes	----- (Y/N)
k)	Chevrons and reflectors fitted on rear to conform to Kenya Traffic Act.	Yes	----- (Y/N)
l)	Stone guards fitted for tail lights.	Yes	----- (Y/N)

12 BODY FINISH.

a)	All body steelwork to be thoroughly cleaned before painting. Both internal and exterior finish to be proceeded by one coat primer (red oxide) and intercoat.	Yes, Yes, Yes	----- (Y/N)
----	--	---------------	----------------

13 WARRANTY

a)	Each vehicle supplied should carry a statement of warranty.	Yes (Mandatory)	----- (Y/N)
b)	Vehicle warranty min. mandatory, 40,000 Km or 12Months whichever occurs first.	specify	----- Km ----- Months

14 MANUALS

a)	All literature in English language	Yes	----- (Y/N)
b)	Shop Manual, supplied.	1 per Vehicle	----- (Y/N)
c)	Parts catalogue , supplied.	1 per Vehicle	----- (Y/N)
d)	Drivers handbook and service schedule supplied.	1 per Vehicle	----- (Y/N)

15. OTHER REQUIREMENT

a) Body builders to have truck body inspected (by Certifying officer, Vehicle inspection Unit) for compliance with Traffic Act prior to delivery to user.	Yes	----- (Y/N)
b) Truck to be registered with the registrar of motorvehicles.	Yes	----- (Y/N)
c) Truck will be inspected by the NTSA Engineer, through the construction stages for compliance with the specification.	Yes	----- (Yes/No)
d) Franchise holder (representative in Kenya) If not, specify relationship with the Franchise holder	Yes Specify whether agent/dealer	----- (Y/ N) -----
e) Availability of spare parts.	Indicate motor vehicle dealers who stock spare parts in Kenya.	----- ----- ----- -----
f) Names and addresses of dealers/agents where back-up service can be obtained indicating the location of the workshops facilities in Kenya.	Specify	----- ----- -----

5.0
5.75

GRAND SUMMARY OF THE BILL OF QUANTITIES

Description	Amount (KES)
1 Preliminary and General Items	-
2 Civil Works	-
3 Electromechanical Works	-
Sub-total (1)	-
Add 10% for Physical Contingencies	-
Sub-total (2)	-
Add 16% for Value Added Tax	-
Grand Total C/F to Bid	-

DAYWORK SCHEDULE

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KSh.)
	CLASS A - GENERAL ITEMS				
	assessing the cost of any extra work ordered by the Engineer for execution on a Dayworks basis. The rates indicated are to be net in relation to the provision of labour, materials or plant indicated. Market rates shall be used if any rate is found to be grossly inconsistent with the market rate.				
	Labour				
A411.1	Unskilled labourer	h	2,000		
A411.2	Foreman	h	200		
A411.3	Plant operator	h	200		
A411.4	Vehicle driver	h	500		
A411.5	Mason	h	500		
A411.6	Carpenter	h	200		
A411.7	Plumber	h	200		
A411.8	Electrician	h	100		
A411.9	Surveyor	h	100		
A411.10	Painter	h	100		
A411.11	Watchman	h	2,000		
	Materials				
	All materials as per specifications. The rate to include for supply, delivery to site, storage and handling.				
A413.1	Coarse aggregates for concrete	m ³	100		
A413.2	Fine aggregates (sand) for concrete	m ³	100		
A413.3	Ordinary portland cement	t	2		
A413.4	Building stone/concrete blocks	nr	200		
A413.5	Hardcore	m ³	500		
A413.6	Murram/gravel	m ³	50		
A413.1	Spigot and socket concrete pipes 900mm dia.	m	50		
A413.2	Double Wall Corrugated HDPE 600mm dia	m	100		
A413.24	Concrete Grade 15/20	m ³	15		
A413.27	BRC mesh A252	m ²	20		
A413.26	Concrete Grade 25/20	m ³	25		
	Total C/F to Next Page				

DAYWORK SCHEDULE

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KSh.)
	Total B/F From Previous Page				
A413.28	High yield twisted steel bars	t	1		
A413.29	Shuttering timber	m ²	50		
A413.30	Diesel	l	500		
A413.31	Lubricants	l	100		
A413.32	Paint-Asorted	l	100		
	Plant				
	grease operators etc.				
A415.1	1 tonne pickup	h	48		
A415.2	7 tonne lorry (tipper)	h	24		
A415.3	15 tonne lorry (tipper)	h	24		
A415.4	20 tonne lorry (tipper)	h	24		
A415.5	D7 bulldozer	h	24		
A415.6	Hydraulic excavator/shovel (1.0m ³)	h	24		
A415.7	Backhoe tractor (1.0m ³)	h	12		
A415.8	Wheel loader	h	8		
A415.9	Mobile crane (5tonne)	h	8		
A415.10	Concrete mixer 1.0m ³	h	12		
A415.11	Dumper, 0.76m ³	h	12		
A415.12	Dumper, 2.0m ³	h	12		
A415.13	Concrete vibrator (petrol or diesel) with drive, flex and 40mm	h	12		
A415.14	Concrete vibrator (petrol or diesel) with drive, flex and 75mm	h	12		
A415.15	Water bowser (5,000 l)	h	12		
A415.16	Portable dewatering pump	h	12		
A415.18	Compaction roller 1 tonne	h	12		
	Total C/F to Next Page				

DAYWORK SCHEDULE

[illegible]

PRELIMINARIES AND GENERAL ITEMS

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KSh.)
	CLASS A - GENERAL ITEMS				
	Contractual Requirements				
A110.1	Performance Security	sum			
A120	Insurance of the Works	sum			
A130	Third Party Insurance	sum			
A190.1	Setting out the Works as specified or directed by the Engineer	sum			
A190.2	Allow for monthly site meetings as specified or directed by Engineer	No.	22		
A190.3	Allow for the provision of 5Nr. Copies record (as-built) drawings ALL in A1 and in softcopy	sum			
A190.4	Allow for provision of 5Nr. Copies O&M Manuals hard copies and soft copies	sum			
	Specified Requirements				
	<i>Offices and Accommodation for the Engineer's Staff</i>				
A211.1	Provisional Sum for RE's offices as instructed by Engineer	sum			5,000,000
A211.2	Provisional sum for rented accommodation for Engineer's Staff (5No.)	month	18	150,000.00	2,700,000
A211.3	% Adjustment to the provisional sum for Items A211.1 to A211.2 to cover overheads and profits	%			
	<i>Services for Engineer's Staff</i>				
A221.1	Provisional sum for purchase of Vehicles (2400cc) for use by Engineer's Staff as instructed. Vehicles to revert to the Employer.	No.	3		
A221.2	% Adjustment to the provisional sum for Items A221.1 to cover overheads and profits	%			
A221.3	Maintenance/running costs of the vehicles for Engineer's staff over the period of contract	km	150,000.00		
	<i>Equipment for Engineer's Staff</i>				
A231.1	Provisional sum for furnishing and equipping the R.E's offices. To include furniture, laptop computers, communication devices, digital cameras, printers e.t.c	sum			5,000,000
	Total C/F to Next Page				

PRELIMINARIES AND GENERAL ITEMS (Continued)

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KSh.)
	Total B/F From Previous Page				
A231.2	% Adjustment to the provisional sum for Item A231.1 to cover for overheads and profits	%			
A231.3	Monthly maintenance of office equipment for use by the Engineer's Staff	month	18		
	Attendance Upon Engineer's Staff				
A241	Provisional Sum for attendance upon Engineer's Staff by drivers (3No.)	month	18		
A244	Provisional Sum for attendance upon Engineer's staff by office assistants (2No.)	month	18		
	Testing of Materials and Works				
A250.1	Provisional sum for testing of materials as specified or directed by the Engineer	sum			300,000
A250.2	% Adjustment to the provisional sum for Item A250.1 to cover for overheads and profits	%			
A260.2	Allow a Provisional sum for Factory Acceptance test witnessed by six engineers, four representatives from the client at the equipment manufacturer's works. Provision should include for all the air tickets, accomodation and actual testing.	sum			4,000,000
	Project Signboards				
A279.1	Provision, fixing, maintaining and removal of site signboards	nr	2		
A279.2	Construction of Project Plaque at conspicuous place as directed	sum			
	Method Related Charges				
	In addition to the items listed hereunder, a tenderer is to insert such items as he may decide to cover, items of work relating to his intended method of executing the works, costs of which are not to be considered as proportional to the quantities of the other items and for which he has not allowed in the rates and prices for the other items				
	Accomodation and Buildings				
A310	Establish, maintain and remove Contractor's camp including offices, stores, laboratories, cabins, canteens etc	sum			
	Total C/F to Next Page				

PRELIMINARIES AND GENERAL ITEMS (Continued)

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KSh.)
	Total B/F From Previous Page				
	Provisional Sums - Dayworks				
A410.1	Labour, Materials and Plant Carried forward from Dayworks schedule	sum			
	Other Provisional Sums				
A 420.2	Provision for the purchase of O&M equipment as directed by Engineer	sum			1,000,000
A.420.5	Allow for manager from Contractor to Run and Maintain the plant including training of staff for 2 years. One year on site full time and one year basic management while allowing NCWSC staff to operate the plant. Staff required for the first year to include: Plant Manager, Logistics Manager, Operation Manager, Electrical Engineer, Mechanical Engineer, an Electrical Technician, Instrumentation Technician and Two Mechanical Technicians. On the Second year allow only the Plant Manager, Mechanical Engineer and Electrical Engineer. See specifications for further details.	sum			
A.420.6	Provisional sum for 1 No. tractor and 6 No. motorcycles for maintenance of the DESTP as directed by Engineer	sum			5,000,000
A.420.7	Provisional Sum for AIDS/HIV,Environmental Conservation etc Awareness, PPE's by Engineer	sum			10,000,000
A.420.8	Allow a Provisional Sum of Kshs 2,000,000 to cater for monthly site meetings as directed by the Project Manager	sum			2,000,000
A.420.9	% Adjustment to the provisional sum for Item A420.7 & A420.8 above to cover for overheads and profits	sum			
	Total C/F to Grand Summary				

SUMMARY OF CIVIL WORKS

Description	Amount (KES)
<p>Bill No. 1 - DESTP Inlet Works Rehabilitation and Duplication</p> <p>Bill No. 2 - DESTP Site Ancillary Work</p>	
Civil Works Sub-Total	-

BILL NO. 1 - DESTP INLET WORKS - REHABILITATION AND DUPLICATION

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KShs)
<u>PART A - DUPLICATION OF INLET WORKS</u>					
CLASS E: EARTHWORKS					
Excavation					
<i>Excavation for Foundations</i>					
E311	Top soil, maximum depth n.e. 0.25m.	m ³	319		
E323	Material other than topsoil, rock, or artificial hard material; depth 0.25-0.5m.	m ³	640		
E330	Rock material (Provisional)	m ³	190		
<i>Excavation Ancillaries</i>					
<u>Disposal of Excavated Material</u>					
Approved material shall be retained for backfilling and unsuitable material shall be disposed to tip. Contractor identify tip site					
E531	Top soil. Disposal within DESTW Site	m ³	319		
E532	Material other than top soil rock or artificial hard material, haulage distance exceeding 1km	m ³	50		
E533	Rock, haulage within DESTP site	m ³	190		
CLASS F: IN SITU CONCRETE					
Note: All concrete designed mix and structural concrete to BS EN206					
Provision of Concrete					
Provide materials and mix concrete to the specified class; cement to BS EN 197					
F233	Provision of concrete grade C15/20	m ³	65.2		
F253	Provision of concrete grade C25/20	m ³	912		
Placing of Concrete					
Place, vibrate and cure concrete in the following elements of the structure as specified or directed by the Engineer					
F511	Mass concrete grade 15/20; blinding, thickness 75mm	m ³	65.2		
F622	Reinforced concrete grade 25/20 in slabs, thickness 150-300mm	m ³	320		
F642	Reinforced concrete grade 25/20 in walls, thickness 150-300mm	m ³	583.4		
F662	Reinforced concrete grade 25/20 in roof columns, 300x300mm ²	m ³	8.6		
Total C/F to Next Page					

BILL NO. 1 - DESTP INLET WORKS REHABILITATION AND DUPLICATION (Continued)

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KShs)
	Total B/F From Previous Page				
	CLASS G: CONCRETE ANCILLARIES				
	Formwork: Fair Finish				
G213	Plane horizontal, width 0.2-0.4m	m ²	275		
G213	Plane Vertical, width upto 2.5m	m ²	2409		
	Reinforcement				
	Rate to include for cutting, bending, supporting, tying and securing				
G522	High yield steel bars (D8) to BS4449	t	1		
G523	High yield steel bars (D10) to BS4449	t	30		
G524	High yield steel bars (D12) to BS4449	t	43		
	Joints				
G653	Plastic or rubber centre bulb water stop, sealant, filler rebate/grooves etc. as specified or directed by engineer	m	120		
	Concrete Accessories				
	<u>Finishing of Surfaces</u>				
G812	Finishing of top surfaces, steel trowel	m ²	235		
	CLASS J: PIPEWORK - FITTINGS AND VALVES				
J885	Electric actuated 1000mm wide by 2500mm deep motorized penstock gate complete with motor, extension spindles, guide brackets and handwheel headstock; Include for operating cap and key	nr	5		
J990.1	Supply and install complete cup screens 1.3m wide	nr	4		
J990.2	Supply and instal mixing paddles for "JETA" Grit Trap series 1300	nr	4		
J990.3	Supply, instal and commision All pipework for "JETA" Grit Trap series 1300	set	4		
J990.4	Supply, instal and commision Airlift pumps for "JETA" Grit Trap series 1300	set	4		
J990.5	Supply and install Jones & Attwood screw clasifiers with a capacity of 500m ³ /h	nr	2		
J990.6	Supply heavy duty movable trash skip minimum capacity 2.0m ³ complete with hoisting lugs, reinforced corners and minimum 6mm thick base plates and 4mm wall plates.	nr	2		
	Total C/F to Next Page				

BILL NO. 1 - DESTP INLET WORKS REHABILITATION AND DUPLICATION (Continued)

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KShs)
	Total B/F From Previous Page				
	CLASS N: MISCELLANEOUS METALWORK				
N140	Supply and fix complete 1.0m high GMS handrails	m	289		
N190.1	Supply and fix complete 1000 x 2500mm long GMS fine screens for overflow channel	Nr	1		
N900.2	Supply screenings removal rake	nr	1		
N900.3	Supply all materials and construct a roofing shade for the screening chamber area complete with polycarbonate corrugated roofing sheets and steel truss structure	m ²	825		
	CLASS U: BRICK, BLOCKS AND MASONRY WORK				
U121	225mm vertical masonry wall for marcerator room walls	m ²	187		
U181	Masonry wall joints reinforcement every other course	m	450		
U182	Damp proof course below masonry wall	m	60		
	CLASS V: PAINTING WORK				
V310	On all exposed metal works, handrails ets	m ²	387		
	<u>PART B - REHABILITATION OF WORKS</u>				
	Flow Measurement				
X900	Supply, instal, calibrated, programmed and test Ultrasonic open channel flow measurement meters at the existing inlet works channel, water distribution channel, All outfall channels	nr	6		
	Screens				
X901.1	Design, seek approval from the engineer, supply, install and commision mechanized raking system for the existing 200mm trash screens complete including Drive Motor (2500mm wide channel and 2500m deep)	nr	2		
X901.2	Supply heavy duty movable trash skip minimum capacity 2.0m ³ complete with hoisting lugs, reinforced corners and minimum 6mm thick base plates and 4mm wall plates.	nr	1		
X901.3	Supply and instal manually raked 75mm clear space coarse screen (2.5m by 2.5m channel) on inlet channels	nr	2		
	Grit Chamber				
X902.1	Supply, instal and automate motorised penstocks to the cup screens	nr	4		
	Total C/F to Next Page				

BILL NO. 1 - DESTP INLET WORKS REHABILITATION AND DUPLICATION (Continued)

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KShs)
	Total B/F From Previous Page				
X902.2	Supply and install replacement screen plates for the cup screens 1.3m wide	nr	4		
X902.3	Supply and install replacement mixing paddles for "JETA" Grit Trap series 1300	nr	4		
X902.4	Supply, install and commission replacement pipework for "JETA" Grit Trap series 1300	set	4		
X902.5	Supply, install and commission replacement Airlift pumps for "JETA" Grit Trap series 1300	set	4		
X902.6	Jones & Attwood screw classifiers with a capacity of 500m ³ /h	nr	2		
X902.7	Supply heavy duty movable trash skip minimum capacity 2.0m ³ complete with hoisting lugs, reinforced corners and minimum 6mm thick base plates and 4mm wall plates.	nr	2		
	De-sludging Manually remove and clean accumulated grit and debris at the Inlet Works inlet channels as well as overflow channel and dispose off as directed by the Engineer. Haulage distance not exceeding 2km (Approximate volume of grit and debris is 1,250m ³)	LS	1		
X903.1					
	De-sludging of Anaerobic Ponds and dispose off the sludge as directed by the engineer within DESTP site. Desludging to be carried out in coordination with NCWSC DESTP staff. Laboratory tests on sludge samples to be carried out in order to determine quality of sludge.	m ³	277,157		
X903.2					
X903.3	De-silting of Nairobi Trunk Sewer.	m	3,700		
	<u>Marcerator Pump House</u>				
X904.1	Supply and Instal Marcerator Pumps complete with all fittings, walls inserts etc	Nr	4		
X904.2	Supply and install all Pipes and associated fittings for the pumps	Set	4		
X904.3	Roof for new Marcerator Pumps House. To include Trusses, Rafters etc and Gauge 28 Galvanised Corrugated Roofing Sheets	m ²	225		
	<u>PART C - CONTROL ROOM</u>				
X500.1	Control Room Building Complete (Excluding footing works which are measured separately. Footing works include compacted hardcore, blinding concrete, footing excavation, reinforcement, forming.). Ceiling should be gypsum ceiling boards. Floor finish is floor tiles 600x600, 900 mm thick porcelain floor tiles.	m ²	373		
X500.2	Control Room Building - footing excavation(measured net vertically)	m ³	177		
	Total C/F to Next Page				

BILL NO. 1 - DESTP INLET WORKS REHABILITATION AND DUPLICATION (Continued)

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KShs)
	Total B/F From Previous Page				
X500.3	Control Room Building - footing backfill	m ³	132		
X500.4	Control Room Building - well compacted hardcore for footing	m ³	44		
X500.5	Control Room Building - blinding concrete for footing	m ³	11		
X500.6	Control Room Building - footing including concrete, reinforcement and forming	m ³	34		
X500.7	Load bearing plate test	Nr	3		
X500.8	Control Room Building sanitary sewer system including manholes, pipeworks, septic tank and connection to the septic tank	Item	1		
X500.9	Collection chamber complete including discharge	Item	1		
X500.10	Control room Building water distribution system.	Item	1		
X500.11	Wash water collection and distribution system complete. Include all facilities with the wash water distribution system. Complete with all M & E works, structures, pipeworks, wash water taps etc shall also be included.	Item	1		
X500.12	Fixed Wash down hose reel complete with a 30 m long hose with attachments	Nr	1		
X500.13	Allow a PC Sum for provision and installation of electricity and electrical supplies to the site by Kenya Power and Lightning Company	PC	1	1,500,000	1,500,000
X500.14	Allow a PC Sum for provision of electrical installations, lighting fixtures and accessories to site	PC	1	1,200,000	1,200,000
X500.15	Allow a Provision sum for furnishing the control room to engineers specifications. Include for desks, tables, chairs, computers, shelves/cabinets, landline telephones, fans, printer, monitoring screens, kitchen amenities, etc	PS	1	5,000,000	5,000,000
X500.16	Contractor's overheads and profits for item X500.13, X500.14 and X500.15	%			
	Replacement of Asbestos Roofing Tiles				
X905.1	Supply all materials and construct a roofing shade for the screening chamber area complete with polycarbonate corrugated roofing sheets	m ²	825		
X905.2	Ditto but at trunk sewer outlet point	m ²	65		
	Total C/F to Grand Summary				

BILL NO. 2 – SITE WORKS (ACCESS ROADS, BOUNDARY WALL AND FENCING)

Item No	Description	Unit	Quantity	Rate (KSh.)	Amount (KShs)
<u>PART A : ACCESS ROADS</u>					
CLASS D - DEMOLITION AND SITE CLEARANCE					
D100	General site clearance	ha	16		
D210	Removal of trees and bushes, girth 0.5-1m	nr	250		
CLASS E - EARTHWORKS					
Excavation shall include for strutting, shuttering, stabilizing excavated surfaces, keeping excavations free of water.					
Excavation for Cuttings					
E210	Topsoil stripping, depth not exceeding 0.25m.	m ³	50,250		
Filling					
Includes placing and compacting as specified					
E625	Filling with imported natural material other than top soil and rock to form road embankment. Compaction to 98% MDD including all necessary sclarifying and watering. Depth not exceeding 0.25m.	m ³	41,875		
CLASS R : ROADS & PAVINGS					
R114.1	Granular (Murrum) compacted to 98% MDD in accordance with specification, depth 200mm	m ³	33,500		
<u>PART B : STORM WATER DRAINAGE CHANNEL</u>					
E311	Stripping of Top soil, maximum depth n.e. 0.25m.	m ³	1269		
E323	Excavation of Material other than topsoil, rock, or artificial hard material;	m ³	7616		
K446	Ditches: stormwater trapezoidal drain channel lined with Reinforced Concrete and BRC A142 Mesh. cutting to directed inverts and dimensions, cross-sectional area n.e 1.5 - 2m ²	m	2031		
K855	Construction of Outfall structure to Nairobi River comprising of Headwall, wingwalls and Apron.	Nr	1		
<u>PART C : BOUNDARY MASONRY WALL</u>					
CLASS X : MISCELLANEOUS WORKS					
X136.1	Construct Masonry Wall on the western edge of the Dandora Estate Sewage Treatment Works. The height of wall to be 2.4 meters above the ground level. Maximum reinforced Columns spacing to be 3m center to center with double column expansion joint at every 15m spacing.	m	3,500		
Total C/F to Next Page					

SUMMARY OF ELECTROMECHANICAL WORKS

DESCRIPTION	AMOUNT (Kshs)
BILL NO. 01	
BILL NO. 02	
BILL NO. 03	
BILL NO. 04	
BILL NO. 05	
BILL NO. 06	
BILL NO. 07	
BILL NO. 08	
BILL NO. 09	
BILL NO. 10	
BILL NO. 11	
BILL NO. 12	
BILL NO. 13	
BILL NO. 14	
BILL NO. 15	
ELECTROMECHANICAL WORKS PHASE ONE-BILLS NO. 1-15	
DESCRIPTION	AMOUNT (Kshs)
BILL NO. 16	
BILL NO. 17	
BILL NO. 18	
BILL NO. 19	
BILL NO. 20	
BILL NO. 21	
BILL NO. 22	
BILL NO. 23	
BILL NO. 24	
BILL NO. 25	
BILL NO. 26	
BILL NO. 27	
BILL NO. 28	
BILL NO. 29	
BILL NO. 30	
BILL NO. 31	
BILL NO. 32	
BILL NO. 33	
BILL NO. 34	
BILL NO. 35	
BILL NO. 36	
BILL NO. 37	
ELECTROMECHANICAL WORKS PHASE TWO-BILLS NO. 16-37	
SUB TOTAL	

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 01- SUPPLY					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	NOTE: 1. Supply of Equipment: In addition to the supply of equipment/machinery, all Electromechanical Works will include supply and installation and commissioning of any necessary accessories, bolting, etc. 2. Allow for sealing of old fixtures, bolt holes, etc. 3. Any equipment that is removed and is deemed by the Engineer to be in operational condition shall be cleaned and handed over to the Employer for use as spares. Equipment that is deemed not re-useable shall be removed from site by the Contractor and disposed to an approved tip. GENERAL				
1					
1.1	Allow for the diversion of raw sewage to by-pass the Trash Screen inlet Chamber and the Inlet Channel to allow for the installation of the Trash Screen Raking Mechanism and the Intermediate Screen.	Item	Lump Sum		
1.2	Allow for the cleaning of silt and debris from the Trash Screen Inlet Chamber and the Inlet Channel and disposing of the removed debris to a tip approved by the Engineer.	Item	Lump Sum		
1.3	Allow for the cleaning of silt and debris from the Stormwater Overflow Channels adjacent to the Trash Screen Chamber and disposing of the removed debris to a tip approved by the Engineer.	Item	Lump Sum		
1.4	Allow a Provisional Sum of Kshs 1,000,000 for the cleaning of silt and debris from the Stormwater Grit Removal Channels (Phase I Inlet Works) and disposing of the removed debris to a tip approved by the Engineer,	Item	Lump Sum		1,000,000
1.5	Allow for the cleaning of silt and debris from the existing Cup Screen Sumps and disposing of the removed debris to a tip approved by the Engineer.	Item	Lump Sum		
1.6	Allow for the cleaning of silt and debris from the existing Jeta Grit Trap Chambers and disposing of the removed debris to a tip approved by the Engineer.	Item	Lump Sum		
1.7	Allow a Provisional Some for the repair of the damaged Reinforced Concrete base slab in the Stormwater Overflow Channel adjacent to the Trash Screen Chamber.	Item	Lump Sum		
1.8	Supply material for replacement of all corroded metalwork in the Inlet Works with stainless steel	Item	Lump Sum		
1.9	Install material for replacement of all corroded metalwork in the Inlet Works with stainless steel	Item	Lump Sum		
1.10	Allow for replacement of existing drainage gates upstream of the existing Trash Screen.To include replacement of bolts & nuts with new, servicing, lubricating, replacing rusted parts with stainless steel and putting gates back into normal operation (Supply only).	nr	3		
1.11	Allow for replacement of existing drainage gates upstream of the existing Trash Screen.To include replacement of bolts & nuts with new, servicing, lubricating, replacing rusted parts with stainless steel and putting gates back into normal operation (Installation only).	nr	3		

1.12	Allow for the replacement of the existing drainage penstock gates downstream of the existing Trash Screen with stainless steel penstock gates. The spindles, bolts and nuts must also be replaced- include for servicing the system, lubrication, replace corroded parts with stainless steel and put gates back into normal operation as detailed in general specification section 2.16 Note this bill includes the gates in front of the trash screen and the bypass gates just before the screens. Include all accessories and parts as listed above. Include for any other part to allow the system to function as intended. Dimensions are as follows: 1M wide x 2.5M deep (Supply Only)	nr	2		
1.13	Install the drainage penstock gates downstream of the existing Trash Screen with stainless steel penstock gates. The spindles, bolts and nuts must also be replaced- include for servicing the system, lubrication, replace corroded parts with stainless steel and put gates back into normal operation as detailed in general specification section 2.16 Note this bill includes the gates in front of the trash screen and the bypass gates just before the screens. Include all accessories and parts as listed above. Include for any other part to allow the system to function as intended. Dimensions are as follows: 1mtre wide x 2.5mtre deep (Supply Only)	nr	2		
1.14	Detailed design and general arrangement drawings	ls	1		
1.15	Project Management during contract execution	ls	1		
TOTAL PAGE 1: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 02					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
2.00	<u>MECHANICAL EQUIPMENT</u>				
	<u>INLET TRASH SCREEN</u>				
2.1	Supply tapered 10mm stainless steel bar with 75mm spacing at the coarse screen inlet to replace the current 200mm spaced screens	nr	100		
2.2	Install tapered 10mm stainless steel bar with 75mm spacing at the coarse screen inlet to replace the current 200mm spaced screens	nr	100		
2.3	Supply stainless steel hand rakes for manual cleaning of the 75mm bar screen as per the specifications.	nr	10		
2.4	Supply new Mechanical Raking Equipment, to suit the 75mm Trash Screen. Include all necessary accessories, electrical wiring and controls, as per the specifications. Note the raking screens control panel shall be at the main control room housing the SCADA about 100 metres away but with stainless steel or plastic covered manual and emergency control at the site. The system is to be capable of operating both remotely, automatically and manually. The trigger for automatic operations shall be the level sensors coupled with a timer switch. The operator at SCADA room must also be able to remotely start and stop the equipment. All the parts, accessories to enable it operate as described here and in the specifications should be included in the price. As detailed in particular specifications 1.2.1	nr	1		
2.5	Install new Mechanical Raking Equipment, to suit the 75mm Trash Screen. Include all necessary accessories, electrical wiring and controls, as per the specifications. Note the raking screens control panel shall be at the main control room housing the SCADA about 100 metres away but with stainless steel or plastic covered manual and emergency control at the site. The system is to be capable of operating both remotely, automatically and manually. The trigger for automatic operations shall be the level sensors coupled with a timer switch. The operator at SCADA room must also be able to remotely start and stop the equipment. All the parts, accessories to enable it operate as described here and in the specifications should be included in the price. As detailed in particular specifications 1.2.1	nr	1		
2.6	Allow a Provisional Sum of Kshs 750,000 for any necessary civil works for the installation of the Mechanical Raking Equipment in the item above.	Item	Lump Sum		750,000
2.7	Supply New Flushing Pumps Sets (1 Duty+ 1 Stand by) complete with new pipe work, Solenoid Valves / Motor operated valves for activation of flushing water into the trash discharge chute. These Flushing Pumps will be used for both the Trash Screen and the Proposed Intermediate Screen. Allow for all interconnecting pipework, valves, etc. Flushing pumps to be rated as follows: Flow rate 24.0m ³ /hr. against head of 23.6m. Motor power 4kw 400V. Speed 2900 r.p.m. Efficiency 75%	Item	Lump Sum		
2.8	Install the New Flushing Pumps Sets (1 Duty+ 1 Stand by) complete with new pipe work, Solenoid Valves / Motor operated valves for activation of flushing water into the trash discharge chute. These Flushing Pumps will be used for both the Trash Screen and the Proposed Intermediate Screen. Allow for all interconnecting pipework, valves, etc. Flushing pumps to be rated as follows: Flow rate 24.0m ³ /hr. against head of 23.6m. Motor power 4kw 400V. Speed 2900 r.p.m. Efficiency 75%	Item	Lump Sum		-
	INLET FLOW CONTROL PENSTOCKS				

2.9	Supply Penstock gates to replace the existing Penstock gates, including replacing all bolts & nuts, driveshaft & guides, lubrication, painting and putting the gates into normal operation. The replaced penstock gates to be stainless steel class 304. Dimensions: 1M wide x 2.5M deep (Supply Only)	nr	2		
2.10	Install Penstock gates, including replacing all bolts & nuts, driveshaft & guides, lubrication, painting and putting the gates into normal operation. The replaced penstock gates to be stainless steel class 304. Dimensions: 1M wide x 2.5M deep (Supply Only)	nr	2		
2.11	Supply new electrically operated Motorised Actuator Units for the replaced Penstock gates as per the specifications.	nr	2		
2.12	Install new electrically operated Motorised Actuator Units for the replaced Penstock gates as per the specifications. <u>NEW INTERMEDIATE 25mm SCREEN WITH MECHANICAL RAKING SYSTEM, SCREENINGS, LAUNDER, ETC.</u>	nr	2		
2.13	Supply New Stainless Steel Intermediate Mechanically Raked Bar Screen with 25mm bar spacings to suit the existing Intermediate Channel's width and depth as detailed in detailed in particular specifications section 1.2.1. Remove the existing screens and handover to the client for safe keeping.	nr	1		
2.14	Install New Stainless Steel Intermediate Mechanically Raked Bar Screen with 25mm bar spacings to suit the existing Intermediate Channel's width and depth as detailed in detailed in particular specifications section 1.2.1. Remove the existing screens and handover to the client for safe keeping.	nr	1		
2.15	Supply Stainless Steel hand rake Suitable for manual cleaning of the New 25mm Bar Screen as per the specifications.	nr	10		
2.16	Supply new Stainless Steel Screenings Launder Channel between the new Intermediate Screen and the Screenings Handling Facility. Dimensions are as follows: 1.5mtre wide x 2.5mtre deep	nr	1		
2.17	Install new Stainless Steel Screenings Launder Channel between the new Intermediate Screen and the Screenings Handling Facility. Dimensions are as follows: 1.5mtre wide x 2.5mtre deep	nr	1		
TOTAL PAGE 2: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 03					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
2.12	<u>CUP SCREENS</u> as detailed in particular specifications section 1.2.6 Replace the existing actuated Penstocks at the inlet to the Cup Screens, including replacing bolts & nuts with new, servicing oi driveshaft & guides, lubricate, paint and put back into normal operation.	nr	4		
2.13	Supply new electrical operated Motorised Actuator Units for the replaced Inlet Pen Stock gates as per the specifications.	nr	4		
3.1	Allow a Provisional Sum of Kshs.1,000,000 for any necessary Civil Works for the installation of the new Intermediate Screen and Raking Equipment in the item above.	ls	1	1,000,000	1,000,000
3.2	<u>CUP SCREENS</u> as detailed in particular specifications section 1.2.6 Supply Pestock Gates to replace the existing actuated Penstocks at the inlet to the Cup Screens, including replacing bolts & nuts with new, servicing oi driveshaft & guides, lubricate, paint and put back into normal operation.	nr	4		
3.3	Install the actuated Penstocks at the inlet to the Cup Screens, including replacing bolts & nuts with new, servicing oi driveshaft & guides, lubricate, paint and put back into normal operation.	nr	4		
3.4	Supply new electrical operated Motorised Actuator Units for the replaced Inlet Pen Stock gates as per the specifications.	nr	4		
3.5	Install the new electrical operated Motorised Actuator Units for the replaced Inlet Pen Stock gates as per the specifications.	nr	4		
3.6	Allow for the dismantling, inspection and assessment of the condition of the existing Cup Screens and associated equipment and handing over all components removed for replacement to the Employer or disposing to an approved location as directed by the Engineer.	nr	4		
3.7	Supply complete Cup and drum screen unit complete with New Drive Assembly unit complete with Motor having Low & High Speed operation features for each of the Cup Screen, as per the specifications. Cup Screensto be equipped with Splash guard stainless steel enclosure. Include any other asseccories and parts necessary for proper functioning of the cup screen unit. Each cup screen unit shall be capable of handling 65,000 cubic metres of raw sewage per day. The degritters shall be designed to remove particles above 0.2mm diamter and specific gravity of 2.65. As detailed in particular specifications 1.2.6	nr	4		
3.8	Install complete Cup and drum screen unit complete with New Drive Assembly unit complete with Motor having Low & High Speed operation features for each of the Cup Screen, as per the specifications. Cup Screensto be equipped with Splash guard stainless steel enclosure. Include any other asseccories and parts necessary for proper functioning of the cup screen unit. Each cup screen unit shall be capable of handling 65,000 cubic metres of raw sewage per day. The degritters shall be designed to remove particles above 0.2mm diamter and specific gravity of 2.65. As detailed in particular specifications 1.2.6	nr	4		
3.9	Service the existing Spider Hub section for each Cup Screen assembly together with Girth gear & lubrication system. Bearings (extra item)	nr	4		
3.10	Supply New Seals for each Drum Screen complete with fixing hardware parts.	nr	4		
3.11	Install the new Seals for each Drum Screen complete with fixing hardware parts.	nr	4		
3.12	Supply new Screening Panels for each Cup Screen unit to control and protect the units as per the specifications.	nr	4		
3.13	Install new Screening Panels for each Cup Screen unit to control and protect the units as per the specifications.	nr	4		

3.14	Supply New Jet Water Spray System for cleaning the Cup Screens.	nr	4		
3.15	Install the New Jet Water Spray System for cleaning the Cup Screens.	nr	4		
3.16	Supply New Contra-rotating Cleaning Brush Assembly for trash / debris removal from the Drum Screen, of the same make as the existing or Approved Equivalent.	nr	4		
3.17	Install the New Contra-rotating Cleaning Brush Assembly for trash / debris removal from the Drum Screen, of the same make as the existing or Approved Equivalent.	nr	4		
3.18	Rehabilitate the existing Trash Discharge hopper and trash elevating tray for each Cup Screen.	nr	4		
3.19	Supply Rotary Strainer Equipment for each Cup Screen, including replacing of the fine screen, seal system, lubrication of shaft bearings and scraper blade.	nr	4		
3.20	Install Rotary Strainer Equipment for each Cup Screen, including replacing of the fine screen, seal system, lubrication of shaft bearings and scraper blade.	nr	4		
3.21	Compressors/Air Blower for grit station. Supply reciproactaing action robust design compressors covered in stainless steel housing to limit corrosion. The unit shall be capable of 1 bar pressure at 3000 revolutions per minute while delivering 40 cubic metres per hour. They shall be robust and applicable for industrial actions. The receives shall have 4 times the capacity of the grit chamber and able to withstand the corrosive environment. The compressors shall come equipped with pressure switches to allow for automatic switching of the unit. The compressors must be able to perform for 168 hours continious operation without a break or need of service. The air reservoir shall drain automatically to prevent water accumulation in the unit while the oil content of the air shall be limited to 0.5mg/litre.	nr	4		
3.22	Compressors/Air Blower for grit station. Install the reciproactaing action robust design compressors covered in stainless steel housing to limit corrosion. The unit shall be capable of 1 bar pressure at 3000 revolutions per minute while delivering 40 cubic metres per hour. They shall be robust and applicable for industrial actions. The receives shall have 4 times the capacity of the grit chamber and able to withstand the corrosive environment. The compressors shall come equipped with pressure switches to allow for automatic switching of the unit. The compressors must be able to perform for 168 hours continious operation without a break or need of service. The air reservoir shall drain automatically to prevent water accumulation in the unit while the oil content of the air shall be limited to 0.5mg/litre.	nr	4		
3.23	Supply New Drive Unit, complete with Motor, for the Rotary Strainer Equipments.	nr	4		
3.24	Install the New Drive Unit, complete with Motor, for the Rotary Strainer Equipments.	nr	4		
TOTAL PAGE 3: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 04					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
4.1	Allow for replacing corroded metal work of the cup screen structure as per the specification.	ls	4		
4.2	Allow for the dismantling, inspection and assessment of the condition of the existing Macerators and associated pipework in the Macerator Room and handing over all components removed to the Employer or disposing to an approved location as directed by the Engineer. Allow for cleaning out the existing Macerator Sump and disposing of the debris in an approved manner. Replace the whole unit with new as per the specifications.	ls	1		
	<u>SCREENINGS HANDLING EQUIPMENT</u>				
4.3	Supply New Screw Wash Compactors, for Screening Launderers as well as for the Intermediate Screen.	nr	4		
4.4	Install New Screw Wash Compactors, for Screening Launderers as well as for the Intermediate Screen.	nr	4		
4.5	Supply Overhead Travelling 3 Ton Gantry Crane and provide certification of load bearing capacity afte completing the Replacement Works. Note: this will have to be carried out at commencement to enable use of the crane and gantry as necessary for the Rehabilitation Works,	nr	1		
2.3	Install the Overhead Travelling 3 Ton Gantry Crane and provide certification of load bearing capacity afte completing the Replacement Works. Note: this will have to be carried out at commencement to enable use of the crane and gantry as necessary for the Rehabilitation Works,	nr	1		
4.6	Supply New Screening Launderers (Stainless Steel) from existing concrete launders to New Screw Wash Compactors as per the specifications.	nr	4		
4.7	Install New Screening Launderers (Stainless Steel) from existing concrete launders to New Screw Wash Compactors as per the specifications.	nr	4		
4.8	Isuzu or approved equivalent truck with tipper for corrosive trash transport and off loading to the incinerator with automatic 6 gear plus 1 reverse, 6 tonne, with hydraulic control rear container,	nr	2		
	<u>JETA GRIT TRAP UNIT</u>				
4.9	Allow for the dismantling, inspection and assessment of the condition of the existing Jeta Grit Trap Units and associated equipment and handing over all components removed to the Employer or disposing to an approved location as directed by the Engineer.	nr	4		
4.10	Supply grit trap unit including, New Drive Tubes.	nr	4		
4.11	Install grit trap unit including, New Drive Tubes.	nr	4		
4.12	Supply New Constant Velocity Paddles, of the same make as the existing or approved equivalent.	nr	4		
4.13	Install New Constant Velocity Paddles, of the same make as the existing or approved equivalent.	nr	4		
4.14	Supply New Geared Motor Unit for the Gear Box Drive Unit as per the specifications.	nr	4		
4.15	Install New Geared Motor Unit for the Gear Box Drive Unit as per the specifications.	nr	4		
4.16	Supply New Blower Units complete with motor as per the specifcations.	nr	4		
4.17	Install New Blower Units complete with motor as per the specifcations.	nr	4		

4.18	Supply materials for rehabilitating the existing Air Pipelines, including supplying and replacement components as required.	ls	4		
4.19	Install materials and rehabilitate the existing Air Pipelines, including installing replacement components as required.	ls	4		
4.20	Supply materials for replacing the existing Grit Pipework including valves and accessories as required.	ls	4		
4.21	Install materials for replacing the existing Grit Pipework including valves and accessories as required.	ls	4		
4.22	Apply three coat of paint use the anti corrosion painting scheme outline in the specifications.	ls	1		
4.23	Provisional Sum for the Supply mass burn two stage rotary kiln incinerator capable of burning 30 tons of waste per day. The unit to be supplied with a 30 cubic metre hopper and appropriately sized pre combustion drying system of 30Kw raring. To unit supplied shall come complete with flue gasconditioning and before entering a bag filter. The inner diameterof shell shall be about 2m and lenth 15m.The kiln temperature shall be 850-1000 degrees celsius. The surface temperature of kiln shall be about 180 degrees celsius. The drive mode shall be single direction gear with possibility of reverse for maintenance. Include for building/structure (concrete, reinforcement, etc) to house the incinerator with all electrical, mechanical and plumbing installations as required and directed by the engineer. As detailed in particular specifications for incinerator 3.3	sum	1	31,500,000	31,500,000
4.24	Install mass burn two stage rotary kiln incinerator capable of burning 30 tons of waste per day. The unit to be supplied with a 30 cubic metre hopper and appropriately sized pre combustion drying system of 30Kw raring. To unit supplied shall come complete with flue gasconditioning and before entering a bag filter. The inner diameterof shell shall be about 2m and lenth 15m.The kiln temperature shall be 850-1000 degrees celsius. The surface temperature of kiln shall be about 180 degrees celsius. The drive mode shall be single direction gear with possibility of reverse for maintenance. Include for building/structure (concrete, reinforcement, etc) to house the incinerator with all electrical, mechanical and plumbing installations as required and directed by the engineer. As detailed in particular specifications for incinerator 3.3	nr	1		
TOTAL PAGE 4: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 05					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
5.1	Supply materials for Replacement all metal corroded items of equipment and associated parts of the Grit Trap Unit with stainless steel.	ls	4		
5.2	Install and Replace all metal corroded items of equipment and associated parts of the Grit Trap Unit with stainless steel.	ls	4		
	<u>GRIT SCREW CLASSIFIERS</u>				
5.3	Allow for the dismantling, inspection and assessment of the condition of the existing Grit Screw Classifiers and associated equipment and handing over all components removed to the Employer or disposing to an approved tip as directed by the Engineer.	nr	4		
5.4	Supply New Grit Screw Classifiers in place of the existing equipment. Include for all necessary accessories, fixings and fittings, wiring and controls, etc.	nr	4		
5.5	Install New Grit Screw Classifiers in place of the existing equipment. Include for all necessary accessories, fixings and fittings, wiring and controls, etc.	nr	4		
5.6	Supply New 3 Way Control Valves.	nr	2		
5.7	Supply New 3 Way Control Valves.	nr	2		
	<u>FLOW & LEVEL MEASUREMENT SYSTEM</u>				
	<u>FLOW METERS</u>				
5.8	Supply New Ultra Sonic Flow Meter in the existing Measuring Flume in the Inlet Channel with Local & Remote Flow Rate Indicator, Local Totaliser with 4-20mA DC output signal suitable for open channel flow measurement in flumes. Anticipated range is between 0 to 12,000 cubic metres per hour with ability to measure slightly higher flows by 40%. The outlet unit however will have a higher range upto 24,000 cubic metres per hour.	ls	4		
5.9	Install New Ultra Sonic Flow Meter in the existing Measuring Flume in the Inlet Channel with Local & Remote Flow Rate Indicator, Local Totaliser with 4-20mA DC output signal suitable for open channel flow measurement in flumes. Anticipated range is between 0 to 12,000 cubic metres per hour with ability to measure slightly higher flows by 40%. The outlet unit however will have a higher range upto 24,000 cubic metres per hour.	ls	4		
	<u>LEVEL MEASURING INSTRUMENTS</u>				
5.10	Supply New Ultra Sonic Level Transmitters / Indicator complete with Local & Remote Level Indications with 4-20mA DC output signal, suitable for open channel level measurement.				
5.11	Inlet Raw Sewage Level Measurement in Open Channel	nr	2		
5.12	Level Measurement at Over Flow Gate near Screening Area. Install the New Ultra Sonic Level Transmitters / Indicator complete with Local & Remote Level Indications with 4-20mA DC output signal, suitable for open channel level measurement.	nr	2		
5.13	Inlet Raw Sewage Level Measurement in Open Channel	nr	2		
5.14	Level Measurement at Over Flow Gate near Screening Area.	nr	2		
5.15	Supply 4 position Floatless Level Switches, in the Flow Channels to the Actuated Penstocks at the inlets to the Cup Screens.	nr	4		
5.16	Install 4 position Floatless Level Switches, in the Flow Channels to the Actuated Penstocks at the inlets to the Cup Screens.	nr	4		
5.17	Supply 4 position Floatless Level Switches, in the flow channels for Overflow Out Fall near Cup Screens.	nr	4		
5.18	Install 4 position Floatless Level Switches, in the flow channels for Overflow Out Fall near Cup Screens.	nr	4		
5.19	Supply New Penstock Assembly Unit for Flow Bypass Penstock gate at the Near the screening area.	nr	2		

5.20	Install New Penstock Assembly Unit for Flow Bypass Penstock gate at the Near the screening area. <u>SCADA</u>	nr	2		
5.21	Provisional Sum for the Supply SCADA system to capture and show on different screens general plant status, source of power, power consumption in the plant, power factor of the plant, flows at inlet, intermediate and final discharge station. The system must have capacity to show history of this data for a period of one year. The components shall be as per the detailed specifications. Note the SCADA is to serve both the existing plant and the proposed new plant as directed by the Engineer. As detailed in particular specifications 2.10.3	Sum	1	17,500,000	17,500,000
5.22	Install SCADA system to capture and show on different screens general plant status, source of power, power consumption in the plant, power factor of the plant, flows at inlet, intermediate and final discharge station. The system must have capacity to show history of this data for a period of one year. The components shall be as per the detailed specifications. Note the SCADA is to serve both the existing plant and the proposed new plant. As detailed in particular specifications 2.10.3	Is	1	7,500,000	7,500,000
5.23	Allow for supply of the fibre cables required for the whole instalaltion. As detailed in particular specifications 2.14.1 and 2.14.2	Is	1	2,800,000	2,800,000
5.24	Allow for Installation of the fibre cables required for the whole instalaltion. As detailed in particular specifications 2.14.1 and 2.14.2	Is	1	1,200,000	1,200,000
5.25	Allow a Provisional Sum for Miscellaneous Instrumentation Works and all field devices not included in the equipment mentioned in the bid document.	Is	1	3,000,000	3,000,000
5.26	Comissioning and supervision of the mechanical equipment.	Is	1		
5.27	Provisional sum for the packing, shipping and delivery to site	Is	1		
TOTAL PAGE 5: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 06

ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
6.0	<u>PUMPING EQUIPMENT</u>				
	<u>SUBMERSIBLE PUMP SETS FOR CUP SCREENS WASH WATER</u>				
6.1	Allow for the removal, Inspection and assessment of the condition of the existing Pump Sets for Cup Screen Wash Water, servicing the pumps and handing over to the Employer or disposing to an approved location as directed by the Engineer,	nr	4		
6.2	Supply new open stainless steel impeller with grinding capability Submersible Pumps for Cup Screen Wash Water application, with minimum overall efficiency of 65% . The motor shall be IP68. Pump Characteristics as follows: Type : Submersible Q = 50 m ³ /Hr H = 20Mtrs	nr	4		
6.2	Install new open stainless steel impeller with grinding capability Submersible Pumps for Cup Screen Wash Water application, with minimum overall efficiency of 65% . The motor shall be IP68. Pump Characteristics as follows: Type : Submersible Q = 50 m ³ /Hr H = 20Mtrs	nr	4		
6.3	Supply New Suction & Discharge Valves for Jet spray Pumps	nr	4		
6.4	Install New Suction & Discharge Valves for Jet spray Pumps	nr	4		
6.5	Allow for supply of materials for rehabilitating / modifying the existing Pipe work to suit the new pump sets including modifications, supports-, clamping etc.	nr	4		
6.6	Allow for installation and rehabilitating / modifying the existing Pipe work to suit the new pump sets including modifications, supports-, clamping etc.	nr	4		
6.7	Allow a Provisional Sum of Kshs 500,000 for Foundation modifications as required.	Item	Lump Sum		
	<u>JET WATER SPRAY PUMPS FOR CUP SCREENS CLEANING</u>				
6.8	Allow for the removal, inspection and assessment of the condition of the existing Jet Water Spray Pumps, servicing the pumps and handing over to the Employer or disposing to an approved tip as directed by the Engineer.	nr	4		
6.9	Supply New Jet Spray Pumps for the Cup Screens' Screening Panel cleaning, with open stainless steel impeller with grinding capability. The pump and motor shall have minimum overall efficiency of 65%. Pump Characteristics as follows: Type : Multi Stage Q =20 m ³ /Hr H = 50 Mtr	nr	4		
6.10	Install New Jet Spray Pumps for the Cup Screens' Screening Panel cleaning, with open stainless steel impeller with grinding capability. The pump and motor shall have minimum overall efficiency of 65%. Pump Characteristics as follows: Type : Multi Stage Q =20 m ³ /Hr H = 50 Mtr	nr	4		
6.11	Supply new Valves, both Suction & Discharge, for Wash Water Pumps.	nr	4		
6.12	Install new Valves, both Suction & Discharge, for Wash Water Pumps.	nr	4		

6.13	Allow for rehabilitating / modifying the existing pipe work to suit the new pump sets including modifications, supports, clamping etc. <u>PORTABLE SEWAGE PUMP SETS FOR DRAINAGE 9 9</u>	nr	4		
6.14	Supply & handover to the Employer, new Portable Drainage Pumps (small) complete with 25Mtrs Cables. Type : Portable Single Stage Q = 20 m3/Hr H = 18 Mtrs KW = 2.2	nr	2		
6.15	Supply & handover to the Employer, new Portable Sewage Pump Sets for Drainage with minimum efficiency of 65% at duty point, complete with 25Mtrs 4mm square Cables. Type ; Portable Single Stage Q = 10m ³ /Hr H= 15Mtrs KW = 1.5 KW	nr	2		
TOTAL PAGE 6: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 07					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
7.1	Allow a Provisional Sum of Kshs 1,500,000 for Miscellaneous Works related to supply and installation of Pumping Equipment as required.	Item	Lump Sum		
	<u>ELECTRICAL EQUIPMENT</u>				
7.2	<u>MAIN SUPPLY DISTRIBUTION BOARD</u> Design, Supply new Main Supply distribution Board, Free Standing complete with the following, as per the specifications. 1 X Enclosure IP 54 1 X 1000ATP MCCB Incomer Set of 1000A Cu Busbars with 36kA S/C current cap. 2 X 1000A TP MCCB Incomer - Genset 1 X1000A Bus Coupler 1 X 250A TP MCCB Feeder to PF Plant 2X 250ATP MCCB Feeder to MCC panels at the control room 1 X 100A TP MCCB Feeder to office DB 2 X 63A TP MCCB Feeder to External Lights and Incinerator DBs 1X150KVar PF Plant 2 X 63A TP MCCB Feeder for Future Spare 1 X 150ATP MCCB Feeder for Future Spare 1 x 100ATP MCCB Feeder for Future Spare 1 X KPLC Section 1 X Metering Section 1 X Set of Surge Protection Devices 1 X Set of Indications The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection,earth leakage and dry run protection for the pumps	nr	1		
7.3	<u>MAIN SUPPLY DISTRIBUTION BOARD</u> Install the new Main Supply distribution Board, Free Standing complete with the following, as per the specifications. 1 X Enclosure IP 54 1 X 1000ATP MCCB Incomer Set of 1000A Cu Busbars with 36kA S/C current cap. 2 X 1000A TP MCCB Incomer - Genset 1 X1000A Bus Coupler 1 X 250A TP MCCB Feeder to PF Plant 2X 250ATP MCCB Feeder to MCC panels at the control room 1 X 100A TP MCCB Feeder to office DB 2 X 63A TP MCCB Feeder to External Lights and Incinerator DBs 1X150KVar PF Plant 2 X 63A TP MCCB Feeder for Future Spare 1 X 150ATP MCCB Feeder for Future Spare 1 x 100ATP MCCB Feeder for Future Spare 1 X KPLC Section 1 X Metering Section 1 X Set of Surge Protection Devices 1 X Set of Indications The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection,earth leakage and dry run protection for the pumps	nr	1		
7.4	Design and Supply new Changeover Panel for 300 KVA Genset, as per the specifications	nr	1		
7.5	Install & Commission new Changeover Panel for 300 KVA Genset, as per the specifications	nr	1		

7.6	Supply the following small power & lighting fittings in the Switch Room as per the specifications. 13A Twin Socket Outlet completely wired in 3 x 2.50 mm ² copper cable in 20mm conduit. Twin FL Fitting 4 FT - Batten type 63A TP Socket Outlet c/w Top Plug 32A TP Socket Outlet c/w Top Plug Lighting points consisting of 1.5 mm ² three core copper cables in 20mm HG conduit and fittings including 6A Lighting Switch Miscellaneous Wiring complete with Conduits / Trunking	nr	4		
		nr	6		
		nr	1		
		nr	1		
		nr	6		
		nr	1		
7.7	Install the following small power & lighting fittings in the Switch Room as per the specifications. 13A Twin Socket Outlet completely wired in 3 x 2.50 mm ² copper cable in 20mm conduit. Twin FL Fitting 4 FT - Batten type 63A TP Socket Outlet c/w Top Plug 32A TP Socket Outlet c/w Top Plug Lighting points consisting of 1.5 mm ² three core copper cables in 20mm HG conduit and fittings including 6A Lighting Switch Miscellaneous Wiring complete with Conduits / Trunking	nr	4		
		nr	6		
		nr	1		
		nr	1		
		nr	6		
		nr	1		
7.8	<u>DISTRIBUTION BOARD - INLET WORKS.</u> Design, Supply new Distribution Board at the inlet Works, free standing or wall mounted type, complete, with the following, as per the specifications. 1 X Enclosure (weather Proof) 1 X 250A TP MCCB Incomer 1 X 63A TP MCCB Feeder to Air Blowers Starters 1 X 50A TP MCCB Feeder to Feeder Pumps Starters 3 X 40A TP MCCB Feeder to Trash Rake Area DB, intermediate Rake Machine and Jet Spray Pumps starters 1 X 20A TP MCCB Feeder to Flash Pumps Starters 6 X 16A TP MCCB Feeder to Rotor Strainer, Cup Screen, Jeta Drives, Grit Remover and Conveyor, and Actuator Motors Starters 1 X 16A TP MCCB Feeder Spare 2 X 1.5KW starters + Protection 4 x Actuator controls for Inlet Gates 1 X Protection Devices 1 X Common control Section 1 X Earthing System 1 x Metering Section 1 X Indications The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection, earth leakage and dry run protection for the pumps	nr	1		
7.9	<u>DISTRIBUTION BOARD - INLET WORKS.</u> Install the new Distribution Board at the inlet Works, free standing or wall mounted type, complete, with the following, as per the specifications. 1 X Enclosure (weather Proof)	nr	1		

1 X 250A TP MCCB Incomer				
1 X 63A TP MCCB Feeder to Air Blowers Starters				
1 X 50A TP MCCB Feeder to Feeder Pumps Starters				
3 X 40A TP MCCB Feeder to Trash Rake Area DB, intermediate Rake Machine and Jet Spray Pumps starters				
1 X 20A TP MCCB Feder to Flash Pumps Starters				
6 X 16A TP MCCB Feder to Rotor Strainer, Cup Screen, Jeta Drives, Grit Remover and Conveyer, and Actuator Motors Starters				
1 X 16A TP MCCB Feeder Spare				
2 X 1.5KW starters + Protection				
4 x Actuator controls for Inlet Gates				
1 X Protection Devices				
1 X Common control Section				
1 X Earthing System				
1 x Metering Section				
1 X Indications				
TOTAL PAGE 7: TO COLLECTION SUMMARY PAGE				

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 08

ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
8.1	The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection, earth leakage and dry run protection for the pumps Supply 4C x 120mm ² Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Inlet Works,	m	125		
8.2	Install & Terminate cable on both ends for Item 4.5	Item	Lump Sum		
8.3	<u>SCREENING SYSTEM / GRIT REMOVAL STATION</u> <u>MAIN CONTROL PANEL</u> Design, Supply new Main Control Panel, complete with the following, as per the specifications. <u>Note:</u> The proposed new control panel shall be suitably designed and installed in place of existing control panel. However, the mimic panel has to be retained and is to be rehabilitated by replacing all mimic indicators and associated wiring system with new, so as to make the mimic panel operational and shall be interconnected to the new control panel, all as per the specifications. 1 X Enclosure IP 20 1 X 250 TP MCCB Incomer 1 X Aux controls 4 X Cup Screen Drive starters 4 X Mixer Starters (Reserve) 4 X Feed Pump Starters 4 X Rotary Strainers starters 4 X Jet Wash Water Pump starters 4 X Grit Trap starters 4 X Air Blower starters 2 x Classifier Lub Starters (Provisional) 2 x Screw wash Compactor Starters 2 x Water Pump starters 2 x Flushing Pump Starters 1 X 12 Way TP DB complete with MCBs 1 X instrument Panel section 1 X Rehab of Existing Mimic Panel 1 X Common Control Section 1 X Earthing System 1 x Metering 1 X Indications Set of Local / Remote controls for all starters Set of Auto/Manual controls for all starters The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection, earth leakage and dry run protection for the pumps	nr	1		
8.4	Install the new Main Control Panel, complete with the following, as per the specifications. <u>Note:</u> The proposed new control panel shall be suitably designed and installed in place of existing control panel. However, the mimic panel has to be retained and is to be rehabilitated by replacing all mimic indicators and associated wiring system with new, so as to make the mimic panel operational and shall be interconnected to the new control panel, all as per the specifications.	nr	1		

	1 X Enclosure IP 20 1 X 250 TP MCCB Incomer 1 X Aux controls 4 X Cup Screen Drive starters 4 X Mixer Starters (Reserve) 4 X Feed Pump Starters 4 X Rotary Strainers starters 4 X Jet Wash Water Pump starters 4 X Grit Trap starters 4 X Air Blower starters 2 x Classifier Lub Starters (Provisional) 2 x Screw wash Compactor Starters 2 x Water Pump starters 2 x Flushing Pump Starters 1 X 12 Way TP DB complete with MCBs 1 X instrument Panel section 1 X Rehab of Existing Mimic Panel 1 X Common Control Section 1 X Earthing System 1 x Metering 1 X Indications Set of Local / Remote controls for all starters Set of Auto/Manual controls for all starters The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection,earth leakage and dry run protection for the pumps <u>AUXILIARY DEVICES</u> Supply Local Start/Stop Push Button Station complete with stanchion for the following:				
8.5	75mm Trash Screen - Flushing system at Inlet	nr	1		
8.6	Intermediate Screen - Flushing system at Inlet	nr	1		
8.70	Cup Screen Drive	nr	4		
8.80	Rotor Strainer Drive	nr	4		
8.9	Submersible Pumpsets for Cup Screens Wash Water	nr	4		
	Install Local Start/Stop Push Button Station complete with stanchion for the following:				
8.10	75mm Trash Screen - Flushing system at Inlet	nr	1		
8.11	Intermediate Screen - Flushing system at Inlet	nr	1		
8.12	Cup Screen Drive	nr	4		
8.13	Rotor Strainer Drive	nr	4		
8.14	Submersible Pumpsets for Cup Screens Wash Water	nr	4		
8.15	Supply, fixed Hydrogen Sulphide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
8.16	Install, fixed Hydrogen Sulphide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
8.17	Supply fixed Carbon Monoxide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
8.18	Install fixed Carbon Monoxide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
TOTAL PAGE 8: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 09					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	SMALL POWER & LIGHTING supply of small Power & Lighting fittings, including light fixtures, cables, wiring, trunking, cable tray, earthing, Lightning arrestors, support bracket for light fixtures, cable trays, all as per the specifications, at the following plant locations: a) Inlet Screening Area b) Penstock Gates c) 75mm Intermediate screening d) Cup Screening Area e) Grit removal Area f) Other Locations as detailed below: Sub Distribution board Supply 12 way TPN Sub-distribution board (SDB-1), flush mounted, with 100A TP mainswitch as manufactured by crabbtree with lockable door consisting of: - 4 pc MCB of 32A, 3-ph - 10 pcs MCB of 8A, 1-ph - 10 pc MCB of 32A, 1-ph - 6 pcs reserve place, 1-ph,complete Install 12 way TPN Sub-distribution board (SDB-1), flush mounted, with 100A TP mainswitch as manufactured by crabbtree with lockable door consisting of: - 4 pc MCB of 32A, 3-ph - 10 pcs MCB of 8A, 1-ph - 10 pc MCB of 32A, 1-ph - 6 pcs reserve place, 1-ph,complete Lighting installation Light fittings complete with accessories, lamps and tubes, 1.5 mm² three core heat resisting cables and wiring to an adjacent lighting point (measured separately) and fixing				
9.1	Supply 12 way TPN Sub-distribution board (SDB-1), flush mounted, with 100A TP mainswitch as manufactured by crabbtree with lockable door consisting of: - 4 pc MCB of 32A, 3-ph - 10 pcs MCB of 8A, 1-ph - 10 pc MCB of 32A, 1-ph - 6 pcs reserve place, 1-ph,complete	No	1		
9.2	Install 12 way TPN Sub-distribution board (SDB-1), flush mounted, with 100A TP mainswitch as manufactured by crabbtree with lockable door consisting of: - 4 pc MCB of 32A, 3-ph - 10 pcs MCB of 8A, 1-ph - 10 pc MCB of 32A, 1-ph - 6 pcs reserve place, 1-ph,complete	No	1		
	Lighting installation				
	Light fittings complete with accessories, lamps and tubes, 1.5 mm² three core heat resisting cables and wiring to an adjacent lighting point (measured separately) and fixing				
9.3	Supply material for Lighting points	No	17		
9.4	Install materials for Lighting points	No	17		
9.5	Supply 6 Amp one gang one way switch a crabbtree	No	5		
9.6	Install 6 Amp one gang one way switch a crabbtree	No	5		
	Lighting fittings				
9.7	Supply 50W LED Flood Light, Water Proof, 3000K, complete with Mounting Brackets as Philips or approved equivalent.	No	8		
9.8	Install 50W LED Flood Light, Water Proof, 3000K, complete with Mounting Brackets as Philips or approved equivalent.	No	8		
9.9	Supply 1200mm 1x36W single fluorescent Batten with economy opal diffuser as Philips or approved equivalent	No	9		
9,10	Install 1200mm 1x36W single fluorescent Batten with economy opal diffuser as Philips or approved equivalent	No	9		

	Final sub-circuits from distribution board in cable and conduit installation comprising concealed heavy gauge PVC conduit, 2.5mm² PVC insulated copper cables, 2.5 mm² copper earthing cable including accessories and fittings				
9.11	Supply materials for Flush mounted socket---outlets of 32A, 1-ph, 220/240v, 50HZ, fed through Cu 3x2.5mm2 PVC insulated CU wires in 20mm conduits complete with junction boxes, connectors and accessories	No	4		
9.12	Install materials for Flush mounted socket---outlets of 32A, 1-ph, 220/240v, 50HZ, fed through Cu 3x2.5mm2 PVC insulated CU wires in 20mm conduits complete with junction boxes, connectors and accessories	No	4		
	Final sub-circuit from distribution board in cable and conduit installation comprising concealed heavy gauge PVC conduit 4mm² PVC insulated copper cables, 4mm² earthing cable including accessories.				
9.13	Supply materials for installation of 32A, 3P+N+E power points completely wired in 4 core 4mm ² PVC/SWA/PVC copper cables drawn in trunking and runing from the distribution board to the 3 phase 32A socket outlet excluding the switched socket.	No	3		
9.14	Install materials for installation of 32A, 3P+N+E power points completely wired in 4 core 4mm ² PVC/SWA/PVC copper cables drawn in trunking and runing from the distribution board to the 3 phase 32A socket outlet excluding the switched socket.	No	3		
9.15	Supply 32A, 400V, 3P+N+E Surface mounting interlocked switched socket outlet complete with its top plug as MK Cat No. 9645 RED	No	3		
9.16	Install 32A, 400V, 3P+N+E Surface mounting interlocked switched socket outlet complete with its top plug as MK Cat No. 9645 RED	No	3		
	<u>CABLING WORKS</u>				
9.17	Supply 4C x 25mm ¹ Pvc/Pvc/Swa/Pvc Cable from the LV Board "LV Phase 1" at the New Control Room to Distribution Board at Trash Rake Area.	m	150		
9.18	Install 4C x 25mm ¹ Pvc/Pvc/Swa/Pvc Cable from the LV Board "LV Phase 1" at the New Control Room to Distribution Board at Trash Rake Area.	m	150		
TOTAL PAGE 9: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 10					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
10.1	Supply Galvanized cable trays 200 x 50 x 1.2mm Thick as Nationwide Electrical Industries Ltd Manufactured or equal and approved.	m	120		
10.2	Install Galvanized cable trays 200 x 50 x 1.2mm Thick as Nationwide Electrical Industries Ltd Manufactured or equal and approved.	m	120		
10.3	Supply Lightning Arrestors Complete with Copper Air Terminal,(1500mm x 15mm diameter) Bare Copper conductor tape (25 x 4mm), Brash Bonding, Testing Points and Earthing to Engineer's approval.	No	4		
10.4	Install Lightning Arrestors Complete with Copper Air Terminal,(1500mm x 15mm diameter) Bare Copper conductor tape (25 x 4mm), Brash Bonding, Testing Points and Earthing to Engineer's approval.	No	4		
10.5	Supply 4 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for all Start / Stop Push Button Stations to Main Control Panel.	m	2850		
10.6	Install 4 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for all Start / Stop Push Button Stations to Main Control Panel.	m	2850		
10.7	Terminate cables for all the Push Button Stations including supply of Gland, Shrouds.	nr	64		
10.8	Supply, 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Flow Meter Power Supply to Main control Panel.	m	440		
10.9	Install 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Flow Meter Power Supply to Main control Panel.	m	440		
10.10	Terminate cables for Flow Meter power Supply, including supply of Gland, Shrouds.	nr	4		
10.11	Supply 3 Core x 1.5 mm ² PVc Screen cable for Flow Meter Signals to Main control Panel.	m	440		
10.12	Install 3 Core x 1.5 mm ² PVc Screen cable for Flow Meter Signals to Main control Panel.	m	440		
10.13	Terminate cables for Flow meters signals including supply of Gland, Shrouds.	nr	4		
10.14	Supply 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Level Transmitter's Power Supply to Main control Panel.	m	210		
10.15	Install 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Level Transmitter's Power Supply to Main control Panel.	m	210		
10.16	Terminate cables' for Level Tranmitter's Power Supply, including supply of Gland, Shrouds.		4		
10.17	Supply 3 Core x 1.5 mm ² PVc Screen cable for Leve transmitter signals to Main control Panel to Main Control Panel.	m	210		
10.18	Install 3 Core x 1.5 mm ² PVc Screen cable for Leve transmitter signals to Main control Panel to Main Control Panel.	m	210		
10.19	Allow a Provisional Sum for Supply of New 300mm Wide Cable tray at various locations complete with supports, fixing hardware, bolts & Nuts.	Item	LS		
10.20	Allow a Provisional Sum for installation of New 300mm Wide Cable tray at various locations complete with supports, fixing hardware, bolts & Nuts.	Item	LS		
10.21	Supply New GI Conduits 25mm at various locations, complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	50		
10.22	Install the New GI Conduits 25mm at various locations, complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	50		
10.23	Supply New GI Conduits 32mm at various locations complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	20		
10.24	Install the New GI Conduits 32mm at various locations complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	20		

10.25	Supply 4 Core x 4.0 mm ² PVc/Pvc/Swa/PVC Cable for various motors from the control panel.	m	750		
10.26	Install the 4 Core x 4.0 mm ² PVc/Pvc/Swa/PVo Cable for various motors from the control panel.	m	750		
10.27	Terminate cables for Level transmitter signals including supply of Gland, Shrouds.	nr	4		
10.28	Re-Terminate Main supply Cable from KPLC on the New Main Board, including supply of New Glands, Shrouds.	nr	1		
10.29	Re-Terminate Main supply Cable from Genset No.1 to New Changover section in the New Main Board, including supply of New Glands, Shrouds.	nr	1		
10.30	Re-Terminate Main supply Cable from Genset No.2 to New Main board, including supply of New Glands, Shrouds.	nr	1		
10.31	Re-Terminate Main supply Cable from Main control Panel to New Main board, including supply of New Glands, Shrouds.	nr	2		
10.32	Allow a Provisional Sum of Kshs 200,000 for Re-Terminating all Other supply Cables from Main control Panel to various outgoing circuits including supply of New Glands, Shrouds.	Item	LS		
TOTAL PAGE 10: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 11					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	<u>STREET LIGHTING</u>				
11.1	Supply New Lighting fixtures 150W LED or Approved Equivalent, on the existng street light poles.	nr	12		
11.2	Intall the New Lighting fixtures 150W LED or Approved Equivalent, on the existng street light poles.	nr	12		
11.3	Supply new additional Street Light Column complete with 6A SP MCB & Light Fixures 150W LED or Approved Equivalent at various plant locations.	nr	6		
11.4	Install the new additional Street Light Column complete with 6A SP MCB & Light Fixures 150W LED or Approved Equivalent at various plant locations.	nr	6		
11.5	Supply 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable under ground for new Street Light Columns	m	500		
11.6	Install 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable under ground for new Street Light Columns	m	500		
11.7	Allow a Provisional Sum of Kshs 1,250,000 for Supply and installation of Earthing System	Item	LS		
11.8		Item	1		
	Supply 500KVA Prime in Nairobi Standby Diesel Generator complete with the 1000A TPN ATS and cabling from the generator to the automatic transfer switch at the main switchgear approximately 40 Meters away. The generator to be silent mode as specified in the specifications. Bidder to allow also for supply and installation of 24 hours capacity diesel tank. As detailed in pariculars specifications 2.4.2				
11.9		Item	1		
	Install 500KVA Prime in Nairobi Standby Diesel Generator complete with the 1000A TPN ATS and cabling from the generator to the automatic transfer switch at the main switchgear approximately 40 Meters away. The generator to be silent mode as specified in the specifications. Bidder to allow also for supply and installation of 24 hours capacity diesel tank. As detailed in pariculars specifications 2.4.2				
11.10	MISCELLANEOUS				
11.11	Allow for extended operation and maintenance of plant (provisional). This item should not be extended to the amount column.	Month	1		
11.12	Allow for extended Defects Liability Period stipulated in General Conditions of Contract (Provisional). This Item should not be extended to the amount column.	Month	1		
11.13	Alow for all costs for the Engineer or an Independent Inspector delegated by the Engineer to carry out an independent inspection during manufacture of the plant and equipment in accordance with General Conditions of Contract	Item	Lump Sum		
11.14	Allow for provision of all drawings and Information to be provided by the Contract or as per General Specification	item	Lump Sum		
11.15	Allow for provision of Operation and Maintenance, and Overhaul Manuals as per General Specification	Item	Lump Sum		
11.16	Allow for provision of all 'As Fitted' drawings as per General specification	Item	Lump Sum		
11.17	Provisional Sum for the provision of spares for 5 year for the operation of the plant in accordance with General Specification section 1.1.1 and Particular Specification section 2.7.2. The Tenderer shall provide a list of the spares with each Item individually priced and the total cost to be carried to this Item as directed by the Engineer	Item	Lump Sum	25,000,000	25,000,000
11.18	Allow for provision of all special tools necessary for the maintenance of the plant in accordance with General Specification. The Tenderer shall provide a list of the tools with each item individually priced and total cost to be carried to this Item.	Item	Lump Sum		

11.19	<p>Allow for all expenses for complying with the General Conditions for any intervals and labour not specifically mentioned in the Bills of Quantities but necessary for the satisfactory completion and putting in service of all plant; naming the particular Item and/or Clause references and pricing separately below:</p> <p>a) b) c) d)</p> <p><u>Note:</u> Any cost arising from complying with the Specification, Conditions of Contract, Conditions to Tenderers, Drawings, etc., not included in this Item shall be assumed to be covered by Tender Rates</p> <p>CIVIL. WORKS ASSOCIATED WITH INSTALLATION OF EQUIPMENT</p>	PC			
11.20	Excavation in common Material	m ³	50		
TOTAL PAGE 11: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 12					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
12.1	Extra over for excavation in Rock Class A	m ³	10		
12.2	-Ditto - but Rock Class 8	m ³	10		
12.3	-Ditto - but Rock Class C	m ³	5		
12.4	Formwork - Class F1	m ²	100		
12.5	Formwork - Class F2	m ²	100		
12.6	Formwork - Class F3	m ²	100		
12.7	Provision and placing of mass concrete Class 15/20, including vibrating and casing as specified.	m ²	50		
12.8	-Ditto - but reinforced concrete Class 20/20	m ³	10		
12.9	-Ditto - but reinforced concrete Class 25/20	m ³	30		
12.10	Steel Reinforcement - Supply all diameters; deformed high yield bars to BS 4449; including for cutting, bending tying, etc.	kg	2500		
12.11	Steel Reinforcement -Install all diameters; deformed high yield bars to BS 4449; including for cutting, bending tying, etc.	kg	2500		
12.12	FIRE PROTECTION				
	<u>PRELIMINARIES</u>				
	Allow for preliminaries to transportation of materials and personell, storage on site, security, insurance and performance bonds.	Item			
	<u>G.I.PIPES</u>				
	Supply G.I Pipes confirming to IS 3589 Pt - I Heavy grade with painting, suitable type of supports, anchor fasteners, bolts nuts (Galvanised), clamps, "U" bolte, malleable specials such as Reducers,Tees, elbows, flanges. Including cutting, Welding, fixing in / on walls, ceiling by using suitable supports etc, as per drawings. The quoted rate shall also include for chasing / chipping walls, making bore holes in walls / floor and making them good with filler material and finished in cement mortar etc.				
12.13	100mm nominal dia	M	220		
	80mm nominal dia	M	15		
	Install G.I Pipes confirming to IS 3589 Pt - I Heavy grade with painting, suitable type of supports, anchor fasteners, bolts nuts (Galvanised), clamps, "U" bolte, malleable specials such as Reducers,Tees, elbows, flanges. Including cutting, Welding, fixing in / on walls, ceiling by using suitable supports etc, as per drawings. The quoted rate shall also include for chasing / chipping walls, making bore holes in walls / floor and making them good with filler material and finished in cement mortar etc.				
12.14	100mm nominal dia	M	220		
	80mm nominal dia	M	15		
TOTAL PAGE 12: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 13					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	<u>WRAPPING & COATING</u>				
13.1	Supply 4mm thick pypekote for underground pipes.	M2	270		
	<u>EXTRENAL HYDRANT</u>				
13.2	Supply yard hydrant comprising of the following, Single headed hydrant valve as per IS 5290, made of gunmetal with 63mm dia instantaneous outlet of 80 mm dia fanged inelt, Blank caps, chain and hand wheels etc.	No	15		
13.3	Install yard hydrant comprising of the following, Single headed hydrant valve as per IS 5290, made of gunmetal with 63mm dia instantaneous outlet of 80 mm dia fanged inelt, Blank caps, chain and hand wheels etc.	No	15		
	<u>BUTTERFLY VALVES</u>				
13.4	Supply CI butterfly valves (PN 16) slim seal standard lever operated type confirming to IS Standard with required flanges, nuts, bolts etc. complete. 100mm nominal dia	No	2		
13.5	Install CI butterfly valves (PN 16) slim seal standard lever operated type confirming to IS Standard with required flanges, nuts, bolts etc. complete. 100mm nominal dia	No	2		
	<u>AIR RELEASE VALVE</u>				
13..6	Supply approved make 25mm dia. Automatic air release valve	No	1		
13.7	Install approved make 25mm dia. Automatic air release valve	No	1		
	<u>CIVIL WORKS</u>				
13.8	Excavation up to 1.0 mts. in depth, for laying pipes upto 150mm dia. Including forming bottom surface to required level, refilling the trenches with selected excavated earth around th pipe in layers of 150mm thick, watering, consolidating. Quoted price inclusive of disposing off / Carting away the surplus earth out side the site to a dump yard acceptable local bodies or as directed by the site engineer with a lead of 300 mts. etc. complete.	M	220		
13.9	Hard Rock:Upto 300 mm Normal soil. 300mm to Below 1.5 mtr Hard rock	M	60		
	<u>HEAVY DUTY PIPE</u>				
13.10	Supply Heavy duty pipes of 150 mm dia & NP 2 Class with collars for road/ below floor crossing of Fire water pipes. The rate shall includes excavation, PCC (1:4:8 100 mm thick)bed and ends k as directed by site engineer	M	35		
13.11	Install Heavy duty pipes of 150 mm dia & NP 2 Class with collars for road/ below floor crossing of Fire water pipes. The rate shall includes excavation, PCC (1:4:8 100 mm thick)bed and ends k as directed by site engineer	M	35		
	<u>VALVE CHAMBERS</u>				

13.12	Supply & Construction of valve chamber with 230 mm Brick masonry wall with best quality TM bricks & CM 1:4, on a PCC 1:4;8 bed of 100 mm thick. The wall shall be plastered internally smooth in CM 1:3, water proofing as required and externally rough plastered with sponge finish, including curing. The chamber shall be provided with M.S. 6 / 8 mm thick plate fabricated top cover in leaves with necessary hinges and locking arrangement. The size of the chamber shall be 1200mm x 1200mm x 1500mm in depth.	No	3		
13.13	Install & Construction of valve chamber with 230 mm Brick masonry wall with best quality TM bricks & CM 1:4, on a PCC 1:4;8 bed of 100 mm thick. The wall shall be plastered internally smooth in CM 1:3, water proofing as required and externally rough plastered with sponge finish, including curing. The chamber shall be provided with M.S. 6 / 8 mm thick plate fabricated top cover in leaves with necessary hinges and locking arrangement. The size of the chamber shall be 1200mm x 1200mm x 1500mm in depth.	No	3		
	<u>WRAPPING & COATING</u>				
13.14	Install 4mm thick pyrekote for underground pipes.	M2	270		
TOTAL PAGE 13: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 14					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	<u>PCC PEDESTALS</u>				
14.1	Supply and construction of PCC (1:2:4) pedestals/supports for underground/above ground pipes. Quoted rate shall inclusive of excavation (if required), chipping/chasing, shuttering, plastering (if required) etc. complete.	CM	15		
14.2	Supply and construction of PCC (1:2:4) pedestals/supports for underground/above ground pipes. Quoted rate shall inclusive of excavation (if required), chipping/chasing, shuttering, plastering (if required) etc. complete.	CM	15		
	<u>FIRE RATED PUMP</u>				
14.3	Supply Fire Pumps Set 136.5m³/h, 10.0 bar Electrically driven pump Diesel generator and jockey pump , membrane pressure vessel, valves, check valves, pressure relief valve, pressure transducers, automatic air release valve and eccentric suction reducer, vibration isolating joints, pressure gauges, flow meter, power and control electrical/s panel/s, double batteries, piping drain with valve and cap, pressurestats, power and control cabling, inertia base with vibration isolators, piping with two coats of primer & two coats painting, fittings, sleeves, caulking material, hangers, supports, and identifications according to EN12845 requirements and the specification, with all the requirements for the satisfactory execution operation and completion of the work. As detailed in particulars specifications 2.4.2	Set	1		
14.4	Install Fire Pumps Set 136.5m³/h, 10.0 bar Electrically driven pump Diesel generator and jockey pump , membrane pressure vessel, valves, check valves, pressure relief valve, pressure transducers, automatic air release valve and eccentric suction reducer, vibration isolating joints, pressure gauges, flow meter, power and control electrical/s panel/s, double batteries, piping drain with valve and cap, pressurestats, power and control cabling, inertia base with vibration isolators, piping with two coats of primer & two coats painting, fittings, sleeves, caulking material, hangers, supports, and identifications according to EN12845 requirements and the specification, with all the requirements for the satisfactory execution operation and completion of the work. As detailed in particulars specifications 2.4.2	Set	1		
	<u>CABLES</u>				
14.5	Supply of 1100V grade FIRE RESISTANCE LOW SMOKE multicore, round type, insulated, sheathed, flexible copper conductor control cables with Including necessary end terminations with copper lugs, junction box, crimping identification tags at each end etc.) 4 core x 6 Sq.mm Copper armoured cable	M	150		
14.6	Installation of 1100V grade FIRE RESISTANCE LOW SMOKE multicore, round type, insulated, sheathed, flexible copper conductor control cables with Including necessary end terminations with copper lugs, junction box, crimping identification tags at each end etc.)				
14.7	Installation of 1100V grade FIRE RESISTANCE LOW SMOKE multicore, round type, insulated, sheathed, flexible copper conductor control cables with Including necessary end terminations with copper lugs, junction box, crimping identification tags at each end etc.)	M	150		
	<u>CONDUIT</u>				

14.8	Supply of 20 SWG MS conduit painted with 2 coats of primer and two coats of red enamel paint, embedded in slab/run on wall/wall chases/on false ceiling etc., with pull wires and necessary conduit accessories.	M	150		
14.9	Installation of 20 SWG MS conduit painted with 2 coats of primer and two coats of red enamel paint, embedded in slab/run on wall/wall chases/on false ceiling etc., with pull wires and necessary conduit accessories.	M	150		
UNDERGROUND WATER TANK					
<i>100m³ reinforced concrete Underground Water Storage tank to be constructed by others to S.E's details and The tank connection fittings to be of GMS material.</i>					
14.10	Allow for provision for supply of sleeves for: 40mm dia inlet, 50mm and 100mm dia outlet, 100mm dia overflow, 75mm dia bowser inlet, 100mm dia breather pipe and 450x450mm wash out drain sump.	Item	1		
14.11	Allow for provision for installation of sleeves for: 40mm dia inlet, 50mm and 100mm dia outlet, 100mm dia overflow, 75mm dia bowser inlet, 100mm dia breather pipe and 450x450mm wash out drain sump.	Item	1		
14.12	Allow for supply of 100 mm dia breather/Vent pipe connection including 300 x 300 mm GMS paddle flanges and mosquito netting.	Item	1		
14.13	Allow for installation of 100 mm dia breather/Vent pipe connection including 300 x 300 mm GMS paddle flanges and mosquito netting.	Item	1		
14.14	Allow for 450mm wide 300mm step spacing ladder in AISI 304 stainless steel, and 38 mm Ø polished stainless steel bars to approval.	Item	1		
MECHANICAL FOAM TYPE - 9 LTRS					
14.15	Supply Mechanical foam type fire extinguisher of 9 Kgs. Capacity, with initial filling in brand	No	6		
MECHANICAL CO2 TYPE - 5Kgs					
14.16	Supply Mechanical Carbondioxide type fire extinguisher of 5 Kgs. Capacity, with initial filling in brand	No	6		
FIRE BALL					
14.17	Supply High quality self activated Fire Ball for First Aid Fire Fighting as Elidefire or equal and approved complete with anchorage.	No	2		
TOTAL PAGE 14: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE ONE - BILL NO. 15					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	HOSE REEL Supply the following Plant cleaning systems installation and equipment as described . Pipework in this section to be to Hpv. Tenderers should allow for all fittings, jointings, coupling, including unions and clamps necessary for the proper functioning of the installation when pricing.				
15.1	Supply class HPVC pipe 50mm Dia	LM	40		
15.2	40mm Dia	LM	25		
15.3	25mm Dia	LM	12		
15.4	Extra over pipe for fitting Elbow/.Bend 50mm Dia	NO	6		
15.5	40mm Dia	NO	5		
15.5	25mm Dia	NO	8		
15.6	Equal Tee	NO			
15.7	50mm Dia	NO	2		
15.8	40mm Dia	NO	2		
15.9	<u>Socket</u>	NO			
15.10	50mm Dia	NO	3		
15.11	40mm Dia	NO	2		
15.12	25mm Dia	NO	2		
15.13	<u>Union</u>				
15.14	50mm Dia	NO	4		
15.15	40mm Dia	NO	4		
15.16	25mm Dia	NO	8		
15.17	<u>ANCILLARIES</u>				
15.18	<u>Gate Valve</u>				
15.19	50mm Dia	NO	2		
15.20	25mm Dia	NO	4		
15.21	Supply Booster set pump to supply hosereel for cleaning purposes. The capacity to be 2m3/hr against 25m head complete with control panel ,necessary fittings and accessories	SET	2		
15.22	Install Booster set pump to supply hosereel for cleaning purposes. The capacity to be 2m3/hr against 25m head complete with control panel ,necessary fittings and accessories	SET	2		
15.23	Supply of Housing Curboard for hosereel system to protect against corrosion. Materials for housing be of stainless steel	NO	4		
15.24	Install Housing Curboard for hosereel system to protect against corrosion. Materials for housing be of stainless steel	NO	4		
15.25	Supply of 25mm diameter, 30m long swinging recess hose reel including hexagonal union and gate valve for maintenance isolation of hose reel as 'Eversafe' Ref. No. EH25-SDM-9G or equal and approved.	NO	4		
15.26	Install 25mm diameter, 30m long swinging recess hose reel including hexagonal union and gate valve for maintenance isolation of hose reel as 'Eversafe' Ref. No. EH25-SDM-9G or equal and approved.	NO	4		
15.27	Water tank 10,000 litres capacity Supply as Roto Moulders Ltd Loft Tank polythene rectangular vertical close end tank nominal capacity of 10,000 with lid. Tank to be complete with inlet, outlet and overflow connections and tank connectors as details by the Engineer.	NO	2		

15.28	Install as Roto Moulders Ltd Loft Tank polythene rectangular vertical close end tank nominal capacity of 10,000 with lid. Tank to be complete with inlet, outlet and overflow connections and tank connectors as details by the Engineer.	NO	2		
	HOSE REEL Install the following Plant cleaning systems installation and equipment as described . Pipework in this section to be to Hpvc. Tenderers should allow for all fittings, jointings, coupling, including unions and clamps necessary for the proper functioning of the installation when pricing.				
15.29	Install and set to work class HPVC pipe 50mm Dia	LM	40		
15.30	40mm Dia	LM	25		
15.31	25mm Dia	LM	12		
15.32	Extra over pipe for fitting Elbow/.Bend 50mm Dia	NO	6		
15.33	40mm Dia	NO	5		
15.34	25mm Dia	NO	8		
15.35	Equal Tee	NO			
15.36	50mm Dia	NO	2		
15.37	40mm Dia	NO	2		
15.38	<u>Socket</u>	NO			
15.39	50mm Dia	NO	3		
15.40	40mm Dia	NO	2		
15.41	25mm Dia	NO	2		
15.42	<u>Union</u>				
15.43	50mm Dia	NO	4		
15.44	40mm Dia	NO	4		
15.45	25mm Dia	NO	8		
15.46	<u>ANCILLARIES</u>				
15.47	<u>Gate Valve</u>				
15.48	50mm Dia	NO	2		
15.49	25mm Dia	NO	4		
TOTAL PAGE 15: TO COLLECTION SUMMARY PAGE					
TOTAL BILL CARRIED FORWARD TO SUMMARY SHEET					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 16- SUPPLY					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	NOTE: 1. Supply of Equipment: In addition to the supply of equipment / machinery, all Electromechanical Works will include supply and installation of any necessary accessories, bolting, etc.				
16	GENERAL				
16.1	Supply drainage penstock gates downstream of the Trash Screen with stainless steel penstock gates. The spindles, bolts and nuts must also be replaced- include for servicing the system, lubrication put gates back into normal operation. Note this bill includes the gates in front of the trash screen and the bypass gates just before the screens. Include all accessories and parts as listed above. Include for any other part to allow the system to function as intended. Dimensions are as follows: 1mtre wide x 2.5mtre deep	nr	2		
16.2	Install drainage penstock gates downstream of the Trash Screen with stainless steel penstock gates. The spindles, bolts and nuts must also be replaced- include for servicing the system, lubrication put gates back into normal operation. Note this bill includes the gates in front of the trash screen and the bypass gates just before the screens. Include all accessories and parts as listed above. Include for any other part to allow the system to function as intended. Dimensions are as follows: 1mtre wide x 2.5mtre deep	nr	2		
	Detailed design and general arrangement drawings	ls	1		
	Project Management during contract execution	ls	1		
	MECHANICAL EQUIPMENT				
	INLET TRASH SCREEN				
16.3	Supply tapered 10mm stainless steel bar with 75mm spacing at the coarse screen inlet	nr	100		
16.4	Install tapered 10mm stainless steel bar with 75mm spacing at the coarse screen inlet	nr	100		
16.5	Supply stainless steel hand rakes for manual cleaning of the 75mm bar screen as per the specifications.	nr	10		
16.6	Install stainless steel hand rakes for manual cleaning of the 75mm bar screen as per the specifications.	nr	10		
16.7	Supply new Mechanical Raking Equipment, to suit the 75mm Trash Screen. Include all necessary accessories, electrical wiring and controls, as per the specifications. Note the raking screens control panel shall be at the main control room housing the SCADA about 100 metres away but with stainless steel or plastic covered manual and emergency control at the site. The system is to be capable of operating both remotely, automatically and manually. The trigger for automatic operations shall be the level sensors coupled with a timer switch. The operator at SCADA room must also be able to remotely start and stop the equipment. All the parts, accessories to enable it operate as described here and in the specifications should be included in the price. As detailed in particular specifications 1.2.1	nr	1		
16.8	Install new Mechanical Raking Equipment, to suit the 75mm Trash Screen. Include all necessary accessories, electrical wiring and controls, as per the specifications. Note the raking screens control panel shall be at the main control room housing the SCADA about 100 metres away but with stainless steel or plastic covered manual and emergency control at the site. The system is to be capable of operating both remotely, automatically and manually. The trigger for automatic operations shall be the level sensors coupled with a timer switch. The operator at SCADA room must also be able to remotely start and stop the equipment. All the parts, accessories to enable it operate as described here and in the specifications should be included in the price. As detailed in particular specifications 1.2.1	nr	1		
16.9	Allow a Provisional Sum of Kshs 750,000 for any necessary civil works for the installation of the Mechanical Raking Equipment in the item above.	Item	Lump Sum		
16.10	Supply New Flushing Pumps Sets (1 Duty+ 1 Stand by) complete with new pipe work, Solenoid Valves / Motor operated valves for activation of flushing water into the trash discharge chute. These Flushing Pumps will be used for both the Trash Screen and the Proposed Intermediate Screen. Allow for all interconnecting pipework, valves, etc.	Item	Lump Sum		
16.11	Install New Flushing Pumps Sets (1 Duty+ 1 Stand by) complete with new pipe work, Solenoid Valves / Motor operated valves for activation of flushing water into the trash discharge chute. These Flushing Pumps will be used for both the Trash Screen and the Proposed Intermediate Screen. Allow for all interconnecting pipework, valves, etc.	Item	Lump Sum		
	INLET FLOW CONTROL PENSTOCKS				
16.12	Supply Penstock gates, including replacing all bolts & nuts, driveshaft & guides, lubrication, painting and putting the gates into normal operation. The replaced penstock gates to be stainless steel class 304.	nr	2		
16.13	Install Penstock gates, including replacing all bolts & nuts, driveshaft & guides, lubrication, painting and putting the gates into normal operation. The replaced penstock gates to be stainless steel class 304.	nr	2		
16.14	Supply new electrically operated Motorised Actuator Units for Penstock gates as per the specifications.	nr	1		
16.15	Install new electrically operated Motorised Actuator Units for Penstock gates as per the specifications.	nr	1		
	NEW INTERMEDIATE 25mm SCREEN WITH MECHANICAL RAKING SYSTEM, SCREENINGS, LAUNDER, ETC.				
16.16	Supply New Stainless Steel Intermediate Mechanically Raked Bar Screen with 25mm bar spacings to suit the existing Intermediate Channel's width and depth.	nr	1		
16.17	Install New Stainless Steel Intermediate Mechanically Raked Bar Screen with 25mm bar spacings to suit the existing Intermediate Channel's width and depth.	nr	1		
16.18	Supply Stainless Steel hand rake Suitable for manual cleaning of the New 25mm Bar Screen as per the specifications.	nr	10		
16.19	Install Stainless Steel hand rake Suitable for manual cleaning of the New 25mm Bar Screen as per the specifications.	nr	10		
16.20	Supply & Fit new Stainless Steel Screenings Launder Channel between the new Intermediate Screen and the Screenings Handling Facility.	nr	1		
16.21	Install & Fit new Stainless Steel Screenings Launder Channel between the new Intermediate Screen and the Screenings Handling Facility.	nr	1		
TOTAL PAGE 16: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 17					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
17.1	Allow a Provisional Sum of Kshs.1,000,000 for any necessary Civil Works for the installation of the new Intermediate Screen and Raking Equipment in the item above. <u>CUP SCREENS</u>	ls	1		1,000,000.00
17.2	Supply actuated Penstocks at the inlet to the Cup Screens, including replacing bolts & nuts with new, servicing oi driveshaft & guides, lubricate, paint and put back into normal operation. As detailed in particular specifications 1.2.5 and 1.2.6	nr	4		
17.3	Install actuated Penstocks at the inlet to the Cup Screens, including replacing bolts & nuts with new, servicing oi driveshaft & guides, lubricate, paint and put back into normal operation. As detailed in particular specifications 1.2.5 and 1.2.6	nr	4		
17.4	Supply new electrical operated Motorised Actuator Units for the Inlet Pen Stock gates as per the specifications.	nr	4		
17.5	Install new electrical operated Motorised Actuator Units for the Inlet Pen Stock gates as per the specifications.	nr	4		
17.6	Supply complete Cup and drum screen unit complete with New Drive Assembly unit complete with Motor having Low & High Speed operation features for each of the Cup Screen, as per the specifications. Cup Screens to be equipped with Splash guard stainless steel enclosure. Include any other asseccories and parts necessary for proper functioning of the cup screen unit. Each cup screen unit shall be capable of handling 65,000 cubic metres of raw sewage per day. The degritters shall be designed to remove particles above 0.2mm diamter and specific gravity of 2.65. As discussed in particulars specifications 1.2.6	nr	4		
17.7	Install complete Cup and drum screen unit complete with New Drive Assembly unit complete with Motor having Low & High Speed operation features for each of the Cup Screen, as per the specifications. Cup Screens to be equipped with Splash guard stainless steel enclosure. Include any other asseccories and parts necessary for proper functioning of the cup screen unit. Each cup screen unit shall be capable of handling 65,000 cubic metres of raw sewage per day. The degritters shall be designed to remove particles above 0.2mm diamter and specific gravity of 2.65. As discussed in particulars specifications 1.2.6	nr	4		
17.8	Supply Spider Hub section for each Cup Screen assembly together with Girth gear & lubrication system.	nr	4		
	Bearings (extra item)				
17.9	Install Spider Hub section for each Cup Screen assembly together with Girth gear & lubrication system.	nr	4		
	Bearings (extra item)				
17.10	Supply New Seals for each Drum Screen complete with fixing hardware parts.	nr	4		
17.11	Install New Seals for each Drum Screen complete with fixing hardware parts.	nr	4		
17.12	Supply new Screening Panels for each Cup Screen unit to control and protect the units as per the specifications.	nr	4		
17.13	Install new Screening Panels for each Cup Screen unit to control and protect the units as per the specifications.	nr	4		
17.14	Supply New Jet Water Spray System for cleaning the Cup Screens, of the same make as the existintg or Approved Equivalent.	nr	4		
17.15	Install New Jet Water Spray System for cleaning the Cup Screens, of the same make as the existintg or Approved Equivalent.	nr	4		
17.16	Supply New Contra-rotating Cleaning Brush Assembly for trash / debris removal from the Drum Screen.	nr	4		
17.17	Install New Contra-rotating Cleaning Brush Assembly for trash / debris removal from the Drum Screen.	nr	4		
17.18	Supply Trash Discharge hopper and trash elevating tray for each Cup Screen.	nr	4		
17.19	Install Trash Discharge hopper and trash elevating tray for each Cup Screen.	nr	4		
17.20	Supply Rotary Strainer Equipment for each Cup Screen, including replacing of the fine screen, seal system, lubrication of shaft bearings and scraper blade.	nr	4		
17.21	Install Rotary Strainer Equipment for each Cup Screen, including replacing of the fine screen, seal system, lubrication of shaft bearings and scraper blade.	nr	4		
17.22	Compressors/Air Blower for grit station. Supply reciprocating action robust design compressors coveed in stainless steel housing to limit corrosion. The unit shall be capable of 1 bar pressure at 3000 revolutions per minute while delivering 40 cubic metres of air per hour. They shall be robust and applicable for industrial actions. The receives shall have 4 times the capacity of the grit chamber and able to withstand the corrosive environment. The compressors shall come equipped with pressure switches to allow for automatic switching of the unit. The compressors must be able to perfoem for 168 hours continuous operation without a break or need of service. The air reservoir shall drain automatically to prevent water accumulation in the unit while the oil content of the air shall be limited to 0.5mg/litre.	nr	4		

17.23	Install Compressors/Air Blower for grit station. Supply reciproacting action robust design compressors covered in stainless steel housing to limit corrosion. The unit shall be capable of 1 bar pressure at 3000 revolutions per minute while delivering 40 cubic metres of air per hour. They shall be robust and applicable for industrial actions. The receivers shall have 4 times the capacity of the grit chamber and able to withstand the corrosive environment. The compressors shall come equipped with pressure switches to allow for automatic switching of the unit. The compressors must be able to perform for 168 hours continuous operation without a break or need of service. The air reservoir shall drain automatically to prevent water accumulation in the unit while the oil content of the air shall be limited to 0.5mg/litre.	nr	4		
TOTAL PAGE 17: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 18					
	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
18.1	Install New Drive Unit, complete with Motor, for the Rotary Strainer Equipments.	nr	4		
18.2	Supply New Drive Unit, complete with Motor, for the Rotary Strainer Equipments.	nr	4		
18.3	Supply materials for replacement of corroded metal parts with stainless steel the cup screen structure as per the specification.	ls	4		
18.4	Install material for replacement of corroded metal parts with stainless steel the cup screen structure as per the specification.	ls	4		
	<u>SCREENINGS HANDLING EQUIPMENT</u>				
18.5	Supply New Screw Wash Compactors, for Screening Launderers as well as for the Intermediate Screen.	nr	4		
18.6	Install & Commission New Screw Wash Compactors, for Screening Launderers as well as for the Intermediate Screen.	nr	4		
18.7	Supply Overhead Travelling 3 Ton Gantry Crane and provide certification of load bearing capacity	nr	1		
18.8	Install Overhead Travelling 3 Ton Gantry Crane and provide certification of load bearing capacity	nr	1		
18.9	Supply New Screening Launderers (Stainless Steel) from existing concrete launders to New Screw Wash Compactors as per the specifications.	nr	4		
18.10	Install New Screening Launderers (Stainless Steel) from existing concrete launders to New Screw Wash Compactors as per the specifications.	nr	4		
18.11	Isuzu or approved equivalent truck with tipper for corrosive trash transport and off loading to the incinerator with automatic 6 gear plus 1 reverse, 6 tonne, with hydraulic control rear container	nr	2		
	<u>GRIT TRAP UNIT</u>				
18.12	Supply grit trap unit including, New Drive Tubes.	nr	4		
18.13	Install & commission grit trap unit including, New Drive Tubes.	nr	4		
18.14	Supply New Constant Velocity Paddles, of the same make as the existing or approved equivalent.	nr	4		
18.15	Install & commission New Constant Velocity Paddles, of the same make as the existing or approved equivalent.	nr	4		
18.16	Supply New Geared Motor Unit for the Gear Box Drive Unit as per the specifications.	nr	4		
18.17	Install & Commission New Geared Motor Unit for the Gear Box Drive Unit as per the specifications.	nr	4		
18.18	Supply New Blower Units complete with motor as per the specifications. As discussed in particulars specifications 2.32.2	nr	4		
18.19	Install & Commission New Blower Units complete with motor as per the specifications. As detailed in particular specifications 2.32.2	nr	4		
18.20	Supply Air Pipelines and all the components as required.	ls	4		
18.21	Install and commission Air Pipelines and all the components as required.	ls	4		
18.22	Supply the Grit Pipework including valves and accessories as required.	ls	4		
18.23	Install the Grit Pipework including valves and accessories as required.	ls	4		
18.24	Apply three coat of paint use the anti corrosion painting scheme outline in the specifications.	ls	1		
18.25	Apply three coat of paint use the anti corrosion painting scheme outline in the specifications.	ls	1		
18.26	Provisional Sum for the Supply mass burn two stage rotary kiln incinerator capable of burning 30 tons of waste per day. The unit to be supplied with a 30 cubic metre hopper and a solar heated pre combustion drying. To unit supplied shall come complete with flue gasconditioning and before entering a bag filter. The inner diameterof shell shall be about 2m and lenth 15m.The kiln temperature shall be 850-1000 degrees celsius. The surface temperature of kiln shall be about 180 degrees celsius. The drive mode shall be single direction gear with possibility of reverse for maintenance. Include for building/structure (concrete, reinforcement, etc) to house the incinerator with all electrical, mechanical and plumbing installations as required and directed by the engineer. Include for building/structure (concrete, reinforcement, etc) to house the incinerator with all electrical, mechanical and plumbing installations as required and directed by the engineer. The incinerator shall comply with the inicnerator detailed specification section 3.3	sum	1	31,500,000.00	31,500,000.00

18.27	Install mass burn two stage rotary kiln incinerator capable of burning 30 tons of waste per day. The unit to be supplied with a 30 cubic metre hopper and a solar heated pre combustion drying. To unit supplied shall come complete with flue gas conditioning and before entering a bag filter. The inner diameter of shell shall be about 2m and length 15m. The kiln temperature shall be 850-1000 degrees celsius. The surface temperature of kiln shall be about 180 degrees celsius. The drive mode shall be single direction gear with possibility of reverse for maintenance. Include for building/structure (concrete, reinforcement, etc) to house the incinerator with all electrical, mechanical and plumbing installations as required and directed by the engineer. Include for building/structure (concrete, reinforcement, etc) to house the incinerator with all electrical, mechanical and plumbing installations as required and directed by the engineer. As detailed in particular specifications for incinerator 3.3	nr	1		
18.28	Allow for supply of the solar system for drying the screenings at the beginning but with a facility to use the heat generated from the incinerator to dry once combustion starts.	ls	1		

18.29	Allow for instalaltion of the solar system for drying the screenings at the beginning but with a facility to use the heat generrated from the incinerator to dry once combustion starts.	ls	1		
TOTAL PAGE 18: TO COLLECTION SUMMARY PAGE					31,500,000.00

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 19					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
19.1	Allow Supply of materials for replacing of corroded metal parts with stainless steel all metal items of equipment and associated parts of the Grit Trap Unit. Include for reparation of surfaces to receive paint.	ls	4		
19.2	Allow for installation of materials for replacing of corroded metal parts with stainless steel all metal items of equipment and associated parts of the Grit Trap Unit. Include for reparation of surfaces to receive paint. <u>GRIT SCREW CLASSIFIERS</u>	ls	4		
19.3	Supply New Grit Screw Classifiers. Include for all necessary accessories, fixings and fittings, wiring and controls, etc.	nr	4		
19.4	Install & commission New Grit Screw Classifiers. Include for all necessary accessories, fixings and fittings, wiring and controls, etc.	nr	4		
19.5	Supply New 3 Way Control Valves.	nr	2		
19.6	Install & commission New 3 Way Control Valves. <u>FLOW & LEVEL MEASUREMENT SYSTEM</u> <u>FLOW METERS</u>	nr	2		
19.7	Supply New Ultra Sonic Flow Meter in the Inlet Channel with Local & Remote Flow Rate Indicator, Local Totaliser with 4-20mA DC output signal suitable for open channel flow measurement in flumes. Anticipated range is between 0 to 12,000 cubic metres per hour with ability to measure slightly higher flows by 40%. The outlet unit however will have a higher range upto 24,000 cubic metres per hour.	Is	4		
19.8	Install & Commission New Ultra Sonic Flow Meter in the Inlet Channel with Local & Remote Flow Rate Indicator, Local Totaliser with 4-20mA DC output signal suitable for open channel flow measurement in flumes. Anticipated range is between 0 to 12,000 cubic metres per hour with ability to measure slightly higher flows by 40%. The outlet unit however will have a higher range upto 24,000 cubic metres per hour. <u>LEVEL MEASURING INSTRUMENTS</u> Supply New Ultra Sonic Level Transmitters / Indicator complete with Local & Remote Level Indications with 4-20mA DC output signal, suitable for open channel level measurement.	Is	4		
19.9	a) Inlet Raw Sewage Level Measurement in Open Channel	nr	2		
19.10	b) Level Measurement at Over Flow Gate near Screening Area. <u>LEVEL MEASURING INSTRUMENTS</u> Install & Commission New Ultra Sonic Level Transmitters / Indicator complete with Local & Remote Level Indications with 4-20mA DC output signal, suitable for open channel level measurement.	nr	2		
19.11	a) Inlet Raw Sewage Level Measurement in Open Channel	nr	2		
19.12	b) Level Measurement at Over Flow Gate near Screening Area.	nr	2		
19.13	Supply 4 position Floatless Level Switches, in the Flow Channels to the Actuated Penstocks at the inlets to the Cup Screens.	nr	4		
19.14	Install 4 position Floatless Level Switches, in the Flow Channels to the Actuated Penstocks at the inlets to the Cup Screens.	nr	4		
19.15	Supply 4 position Floatless Level Switches, in the flow channels for Overflow Out Fall near Cup Screens.	nr	4		
19.16	Install 4 position Floatless Level Switches, in the flow channels for Overflow Out Fall near Cup Screens.	nr	4		
19.17	Supply New Penstock Assembly Unit for Flow Bypass Penstock gate at the Near the screening area.	nr	2		
19.18	Install. New Penstock Assembly Unit for Flow Bypass Penstock gate at the Near the screening area. <u>SCADA</u>	nr	2		
19.19	Allow for supply of the fibre cables required for the whole instalaltion to be connected to the SCADA system provided in phase one as detailed in particular specifications section 2.10.	ls			
19.20	Allow for installation and commisioning of the fibre cables required for the whole instalaltion to be connected to the SCADA system provided in phase one. As detailed in particular specifications 2.14.1 and 2.14.2	ls			
19.21	Allow a Provisional Sum for Miscellaneous Instrumentation Works and all field devices not included in the equipment mentioned in the bid document.	ls	1		
19.22	Comissioning supervision of the mechanical equipment.	nr	1		
19.23	Provisional sum for the packing, shipping and delivery to site	nr	1		
TOTAL PAGE 19: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 20					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	Erection of Mechanical Equipment				
	<u>PUMPING EQUIPMENT</u>				
	<u>SUBMERSIBLE PUMP SETS FOR CUP SCREENS WASH WATER</u>				
20.1	Supply new open stainless steel impeller with grinding capability Submersible Pumps for Cup Screen Wash Water application, with minimum overall efficiency of 65% . The motor shall be IP68. Pump Characteristics as follows: Type : Submersible Q = 50 m ³ /Hr H = 20Mtrs	nr	4		
20.2	Install & Commission new open stainless steel impeller with grinding capability Submersible Pumps for Cup Screen Wash Water application, with minimum overall efficiency of 65% . The motor shall be IP68. Pump Characteristics as follows: Type : Submersible Q = 50 m ³ /Hr H = 20Mtrs	nr	4		
20.3	Supply New Suction & Discharge Valves for Jet spray Pumps	nr	4		
20.4	Install & Commission New Suction & Discharge Valves for Jet spray Pumps	nr	4		
20.5	Supply Pipe work to suit the new pump sets including supports-, clamping etc.	nr	4		
20.6	Install Pipe work to suit the new pump sets including supports-, clamping etc.	nr	4		
20.7	Allow a Provisional Sum of Kshs 500,000 for Foundation work as required.	Item	Lump Sum		
20.8	Allow for the removal, inspection and assessment of the condition of the existing Jet Water Spray Pumps, servicing the pumps and handing over to the Employer or disposing to an approved tip as directed by the Engineer.	nr	4		
	<u>JET WATER SPRAY PUMPS FOR CUP SCREENS CLEANING</u>				
20.9	Supply New Jet Spray Pumps for the Cup Screens' Screening Panel cleaning, with open stainless steel impeller with grinding capability. The pump andmotor shall have minimum overall efficiency of 65%. Pump Characteristics as follows: Type : Multi Stage Q =20 m ³ /Hr H = 50 Mtr	nr	4		
20.10	Install & Commssion New Jet Spray Pumps for the Cup Screens' Screening Panel cleaning, with open stainless steel impeller with grinding capability. The pump andmotor shall have minimum overall efficiency of 65%. Pump Characteristics as follows: Type : Multi Stage Q =20 m ³ /Hr H = 50 Mtr	nr	4		
20.11	Supply new Valves, both Suction & Discharge, for Wash Water Pumps.	nr	4		
20.12	Install & Commission new Valves, both Suction & Discharge, for Wash Water Pumps.	nr	4		
20.13	Supply pipe work to suit the new pump sets including, supports, clamping etc.	nr	4		
20.14	Install pipe work to suit the new pump sets including, supports, clamping etc.	nr	4		
	<u>PORTABLE SEWAGE PUMP SETS FOR DRAINAGE 9 9</u>				
20.15	Supply & handover to the Employer, new Portable Drainage Pumps (small) complete with 25Mtrs Cables. Type : Portable Single Stage Q = 20 m ³ /Hr H = 18 Mtrs KW = 2.2	nr	2		
20.16	Install and handover to the Employer, new Portable Drainage Pumps (small) complete with 25Mtrs Cables. Type : Portable Single Stage Q = 20 m ³ /Hr H = 18 Mtrs KW = 2.2	nr	2		
20.17	Supply & handover to the Employer, new Portable Sewage Pump Sets for Drainage, complete with 25Mtrs Cables. Type : Portable Single Stage Q = 10m ³ /Hr H= 15Mtrs KW = 1.5 KW	nr	2		

20.18	Install & handover to the Employer, new Portable Sewage Pump Sets for Drainage, complete with 25Mtrs Cables. Type ; Portable Single Stage Q = 10m ³ /Hr H= 15Mtrs KW = 1.5 KW	nr	2		
TOTAL PAGE 20: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 21					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
21.1	Allow a Provisional Sum of Kshs 1,500,000 for Miscellaneous Works related to supply and installation of Pumping Equipment as required. <u>ELECTRICAL EQUIPMENT</u> Supply the following small power & lighting fittings in the Switch Room as per the specifications.	Item	Lump Sum		
21.2	13A Twin Socket Outlet completely wired in 3 x 2.50 mm ² copper cable in 20mm conduit.	nr	4		
21.3	Twin FL Fitting 4 FT - Batten type	nr	6		
21.4	63A TP Socket Outlet c/w Top Plug	nr	1		
21.5	32A TP Socket Outlet c/w Top Plug	nr	1		
21.6	Lighting points consisting of 1.5 mm ² three core copper cables in 20mm HG conduit and fittings including 6A Lighting Switch	nr	6		
21.7	Miscellaneous Wiring complete with Conduits / Trunking Install the following small power & lighting fittings in the Switch Room as per the specifications.	nr	1		
21.8	13A Twin Socket Outlet completely wired in 3 x 2.50 mm ² copper cable in 20mm conduit.	nr	4		
21.9	Twin FL Fitting 4 FT - Batten type	nr	6		
21.10	63A TP Socket Outlet c/w Top Plug	nr	1		
21.11	32A TP Socket Outlet c/w Top Plug	nr	1		
21.12	Lighting points consisting of 1.5 mm ² three core copper cables in 20mm HG conduit and fittings including 6A Lighting Switch	nr	6		
21.13	Miscellaneous Wiring complete with Conduits / Trunking	nr	1		
21.14	<u>DISTRIBUTION BOARD - INLET WORKS.</u> Design, Supply new Distribution Board at the inlet Works, free standing or wall mounted type, complete, with the following, as per the specifications. 1 X Enclosure (weather Proof) 1 X 250A TP MCCB Incomer 1 X 63A TP MCCB Feeder to Air Blowers Starters 1 X 50A TP MCCB Feeder to Feeder Pumps Starters 3 X 40A TP MCCB Feeder to Trash Rake Area DB, intermediate Rake Machine and Jet Spray Pumps starters 1 X 20A TP MCCB Feder to Flash Pumps Starters 6 X 16A TP MCCB Feder to Rotor Strainer, Cup Screen, Jeta Drives, Grit Remover and Conveyer, and Actuator Motors Starters 1 X 16A TP MCCB Feeder Spare 2 X 1.5KW starters + Protection 4 x Actuator controls for Inlet Gates 1 X Protection Devices 1 X Common control Section 1 X Earthing System 1 x Metering Section 1 X Indications The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection, earth leakage and dry run protection for the pumps	nr	1		
21.15	<u>DISTRIBUTION BOARD - INLET WORKS.</u> Install & Commission new Distribution Board at the inlet Works, free standing or wall mounted type, complete, with the following, as per the specifications. 1 X Enclosure (weather Proof)	nr	1		

1 X 250A TP MCCB Incomer 1 X 63A TP MCCB Feeder to Air Blowers Starters 1 X 50A TP MCCB Feeder to Feeder Pumps Starters 3 X 40A TP MCCB Feeder to Trash Rake Area DB, intermediate Rake Machine and Jet Spray Pumps starters 1 X 20A TP MCCB Feder to Flash Pumps Starters 6 X 16A TP MCCB Feder to Rotor Strainer, Cup Screen, Jeta Drives, Grit Remover and Conveyer, and Actuator Motors Starters 1 X 16A TP MCCB Feeder Spare 2 X 1.5KW starters + Protection 4 x Actuator controls for Inlet Gates 1 X Protection Devices 1 X Common control Section 1 X Earthing System 1 x Metering Section 1 X Indications The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection,earth leakage and dry run protection for the pumps				
TOTAL PAGE 21: TO COLLECTION SUMMARY PAGE				

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 22					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
22.1	Supply 4C x 120mm ² Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Inlet Works,	m	125		
22.2	Install 4C x 120mm ² Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Inlet Works,	m	125		
22.3	Install & Terminate cable on both ends for Item 4.5	Item	Lump Sum		
	<u>SCREENING SYSTEM / GRIT REMOVAL STATION</u> <u>MAIN CONTROL PANEL</u>				
22.4	Design, Supply new Main Control Panel, complete with the following, as per the specifications. <u>Note:</u> The proposed new control panel shall be suitably designed and installed in place of existing control panel. However, the mimic panel has to be retained and is to be rehabilitated by replacing all mimic indicators and associated wiring system with new, so as to make the mimic panel operational and shall be interconnected to the new control panel, all as per the specifications. 1 X Enclosure IP 20 1 X 250 TP MCCB Incomer 1 X Aux controls 4 X Cup Screen Drive starters 4 X Mixer Starters (Reserve) 4 X Feed Pump Starters 4 X Rotary Strianers starters 4 X Jet Wash Water Pump starters 4 X Grit Trap starters 4 X Air Blower starters 2 x Classifier Lub Starters (Provisional) 2 x Screw wash Compactor Starters 2 x Water Pump starters 2 x Flushing Pump Starters 1 X 12 Way TP DB complete with MCBs 1 X instrument Panel section 1 X Rehab of Existing Mimic Panel 1 X Common Control Section 1 X Earthing System 1 x Metering 1 X Indications Set of Local / Remote controls for all starters Set of Auto/Manual controls for all starters The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection,earth leakage and dry run protection for the pumps <u>AUXILIARY DEVICES</u> Supply Local Start/Stop Push Button Station complete with stanchion for the following : <u>SCREENING SYSTEM / GRIT REMOVAL STATION</u> <u>MAIN CONTROL PANEL</u>	nr	1		
22.5	Install & Commission new Main Control Panel, complete with the following, as per the specifications. <u>Note:</u> The proposed new control panel shall be suitably designed and installed in place of existing control panel. However, the mimic panel has to be retained and is to be rehabilitated by replacing all mimic indicators and associated wiring system with new, so as to make the mimic panel operational and shall be interconnected to the new control panel, all as per the specifications. 1 X Enclosure IP 20 1 X 250 TP MCCB Incomer 1 X Aux controls 4 X Cup Screen Drive starters 4 X Mixer Starters (Reserve) 4 X Feed Pump Starters 4 X Rotary Strianers starters 4 X Jet Wash Water Pump starters 4 X Grit Trap starters 4 X Air Blower starters 2 x Classifier Lub Starters (Provisional) 2 x Screw wash Compactor Starters 2 x Water Pump starters 2 x Flushing Pump Starters 1 X 12 Way TP DB complete with MCBs 1 X instrument Panel section 1 X Rehab of Existing Mimic Panel	nr	1		

	1 X Common Control Section				
	1 X Earthing System				
	1 x Metering				
	1 X Indications Set of Local / Remote controls for all starters				
	Set of Auto/Manual controls for all starters				
	The protection shall at the very minimum include phase fault, phase failure relay, thermal over load, overcurrent protection, earth leakage and dry run protection for the pumps				
22.6	75mm Trash Screen - Flushing system at Inlet	nr	1		
22.7	Intermediate Screen - Flushing system at Inlet	nr	1		
22.8	Cup Screen Drive	nr	4		
22.9	Submersible Pump Sets for Cup Screens Wash Water	nr	4		
22.10	Rotary Fine Screening Drive	nr	4		
22.11	Jet Water Spray Pumps for Cup Screen cleaning	nr	4		
22.12	Grit Trap Drive	nr	4		
22.13	Air Blower	nr	4		
22.14	Screw Wash Compactor for Grit	nr	2		
22.15	Screw Wash Compactor for Screenings	nr	2		
	<u>AUXILIARY DEVICES</u>				
	Install Local Start/Stop Push Button Station complete with stanchion for the following :				
22.16	75mm Trash Screen - Flushing system at Inlet	nr	1		
22.17	Intermediate Screen - Flushing system at Inlet	nr	1		
22.18	Cup Screen Drive	nr	4		
22.19	Submersible Pump Sets for Cup Screens Wash Water	nr	4		
22.20	Rotary Fine Screening Drive	nr	4		
22.21	Jet Water Spray Pumps for Cup Screen cleaning	nr	4		
22.22	Grit Trap Drive	nr	4		
22.23	Air Blower	nr	4		
22.24	Screw Wash Compactor for Grit	nr	2		
22.25	Screw Wash Compactor for Screenings	nr	2		
22.26	Supply fixed Hydrogen Sulphide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
22.27	Install & Commission fixed Hydrogen Sulphide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
22.28	Supply fixed Carbon Monoxide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
22.29	Supply, Install Commissioning fixed Carbon Monoxide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
TOTAL PAGE 22: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 23					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	<u>SMALL POWER & LIGHTING</u> Supply of small Power & Lighting fittings, including light fixtures, cables, wiring, trunking, cable tray, earthing, Lightning arrestors, support bracket for light fixtures, cable trays, all as per the specifications , at the following plant locations. a) Cup Screeing Area, b) Grit removal Area c) other Locations as detailed below: Lighting Fittings Supply Light fittings complete with accessories, lamps and tubes, 1.5 mm² three core heat resisting cables and wiring to an adjacent lighting point (measured separately) and fixing				
23.1	Lighting points	No	14		
23.2	6 Amp one gang one way switch a crabtree Lighting fittings	No	5		
23.3	50W LED Flood Light, Water Proof, 3000K, complete with Mounting Brackets as Philips or approved equivalent.	No	6		
23.4	1200mm 1x36W single fluorescent Batten with economy opal diffuser as Philips or approved equivalent	No	8		
23.5	Final sub-circuits from distribution board in cable and conduit Supply comprising concealed heavy gauge PVC conduit, 2.5mm² PVC insulated copper cables, 2.5 mm² copper earthing cable including accessories and fittings Flush mounted socket---outlets of 32A, 1-ph, 220/240v, 50HZ, fed through Cu 3x2.5mm2 PVC insulated CU wires in 20mm conduits complete with junction boxes, connectors and accessories	No	4		
23.6	Final sub-circuit from distribution board in cable and conduit Supply comprising concealed heavy gauge PVC conduit 4mm² PVC insulated copper cables, 4mm² earthing cable including accessories. 32A, 3P+N+E power points completely wired in 4 core 4mm ² PVC/SWA/PVC copper cables drawn in trunking and runing from the distribution board to the 3 phase 32A socket outlet excluding the switched socket.	No	4		
23.7	32A, 400V, 3P+N+E Surface mounting interlocked switched socket outlet complete with its top plug as MK Cat No. 9645 RED	No	4		
	<u>SMALL POWER & LIGHTING</u> Installation of small Power & Lighting fittings, including light fixtures, cables, wiring, trunking, cable tray, earthing, Lightning arrestors, support bracket for light fixtures, cable trays, all as per the specifications , at the following plant locations. a) Cup Screeing Area, b) Grit removal Area c) other Locations as detailed below:				
23.8	Lighting points	No	14		
23.9	6 Amp one gang one way switch a crabtree Lighting fittings	No	5		
23.10	50W LED Flood Light, Water Proof, 3000K, complete with Mounting Brackets as Philips or approved equivalent.	No	6		
23.11	1200mm 1x36W single fluorescent Batten with economy opal diffuser as Philips or approved equivalent	No	8		
23.12	Final sub-circuits from distribution board in cable and conduit installation comprising concealed heavy gauge PVC conduit, 2.5mm² PVC insulated copper cables, 2.5 mm² copper earthing cable including accessories and fittings Flush mounted socket---outlets of 32A, 1-ph, 220/240v, 50HZ, fed through Cu 3x2.5mm2 PVC insulated CU wires in 20mm conduits complete with junction boxes, connectors and accessories	No	4		
23.13	Final sub-circuit from distribution board in cable and conduit installation comprising concealed heavy gauge PVC conduit 4mm² PVC insulated copper cables, 4mm² earthing cable including accessories. 32A, 3P+N+E power points completely wired in 4 core 4mm ² PVC/SWA/PVC copper cables drawn in trunking and runing from the distribution board to the 3 phase 32A socket outlet excluding the switched socket.	No	4		
13.14	32A, 400V, 3P+N+E Surface mounting interlocked switched socket outlet complete with its top plug as MK Cat No. 9645 RED	No	4		
23.15	<u>CABLING WORKS</u> Supply 4 Core x 1,5 mm ² PVc/Pvc/Swa/PVc Cable for all Start / Stop Push Button Stations to Main Control Panel.	m	2850		
23.16	Install 4 Core x 1,5 mm ² PVc/Pvc/Swa/PVc Cable for all Start / Stop Push Button Stations to Main Control Panel.	m	2850		

23.17	Supply 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Flow Meter Power Supply to Main control Panel.	m	440		
23.18	Install 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Flow Meter Power Supply to Main control Panel.	m	440		
23.19	Supply 3 Core x 1.5 mm ² PVC Screen cable for Flow Meter Signals to Main control Panel.	m	440		
23.20	Install 3 Core x 1.5 mm ² PVC Screen cable for Flow Meter Signals to Main control Panel.	m	440		
23.21	Supply 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Level Transmitter's Power Supply to Main control Panel.	m	210		
23.22	Install 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable for Level Transmitter's Power Supply to Main control Panel.	m	210		
23.23	Terminate cables for all the Push Button Stations including supply of Gland, Shrouds.	nr	64		
23.24	Terminate cables for Flow Meter power Supply, including supply of Gland, Shrouds.	nr	4		
23.25	Terminate cables for Flow meters signals including supply of Gland, Shrouds.	nr	4		
23.26	Terminate cables' for Level Tranmitter's Power Supply, including supply of Gland, Shrouds.		4		
TOTAL PAGE 23: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 24					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
24.1	Supply 3 Core x 1.5 mm ² PVC Screen cable for Leve transmitter signals to Main control Panel to Main Control Panel.	m	210		
24.2	Install 3 Core x 1.5 mm ² PVC Screen cable for Leve transmitter signals to Main control Panel to Main Control Panel.	m	210		
24.3	Terminate cables for Level transmitter signals including supply of Gland, Shrouds.	nr	4		
24.4	Re-Terminate Main supply Cable from KPLC on the New Main Board, including supply of New Glands, Shrouds.	nr	1		
24.5	Re-Terminate Main supply Cable from Genset No.1 to New Changover section in the New Main Board, including supply of New Glands, Shrouds.	nr	1		
24.6	Re-Terminate Main supply Cable from Genset No.2 to New Main board, including supply of New Glands, Shrouds.	nr	1		
24.7	Re-Terminate Main supply Cable from Main control Panel to New Main board, including supply of New Glands, Shrouds.	nr	2		
24.8	Allow a Provisional Sum for Re-Terminating all Other supply Cables from Main control Panel to various outgoing circuits including supply of New Glands, Shrouds.	Item	LS		
24.9	Allow a Provisional Sum for Installation of New 300mm Wide Cable tray at various locations complete with supports, fixing hardware, bolts & Nuts.	Item	LS		
24.10	Allow a Provisional Sum for Supply of New 300mm Wide Cable tray at various locations complete with supports, fixing hardware, bolts & Nuts.	Item	LS		
24.11	Supply New GI Conduits 25mm at various locations, complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	50		
24.12	Install New GI Conduits 25mm at various locations, complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	50		
24.13	Supply New GI Conduits 32mm at various locations complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	20		
24.14	Install New GI Conduits 32mm at various locations complete with Mounitng Saddles, supports, fixing hardware, bolts & Nuts.	m	20		
24.15	Supply 4 Core x 4.0 mm ² PVC/Pvc/Swa/PVo Cable for various motors from the control panel.	m	750		
24.16	Install 4 Core x 4.0 mm ² PVC/Pvc/Swa/PVo Cable for various motors from the control panel.	m	750		
STREET LIGHTING					
24.17	Supply New Lighting fixtures 150W LED or Approved Equivalent, on the existng street light poles.	nr	12		
24.18	Install New Lighting fixtures 150W LED or Approved Equivalent, on the existng street light poles.	nr	12		
24.19	Supply new additional Street Light Column complete with 6A SP MCB & Light Fixures 150W LED or Approved Equivalent at various plant locations.	nr	6		
24.20	Install new additional Street Light Column complete with 6A SP MCB & Light Fixures 150W LED or Approved Equivalent at various plant locations.	nr	6		
24.21	Supply 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable under ground for new Street Light Columns	m	500		
24.22	Install 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable under ground for new Street Light Columns	m	500		
24.23	Supply 500KVA Prime in Nairobi Standby Diesel Generator complete with the 1000A TPN ATS and cabling from the generator to the automatic transfer switch at the main switchgear approximately 40 Meters away. The generator to be silent mode as specified in the specifications. Bidder to allow also for supply and installation of 24 hours capacity diesel tank.	Item	1		
24.24	Install, test and commision 500KVA Prime in Nairobi Standby Diesel Generator complete with the 1000A TPN ATS and cabling from the generator to the automatic transfer switch at the main switchgear approximately 40 Meters away. The generator to be silent mode as specified in the specifications. Bidder to allow also for supply and installation of 24 hours capacity diesel tank. The generator will housed in a shade.	Item	1		
24.25	Allow a Provisional Sum of Kshs 1,250,000 for Installation of Earthing System for the whole installation	Item	LS		1,250,000.00
MISCELLANEOUS					
24.26	Allow for extended operation and maintenance of plant (provisional). This item should not be extended to the amount column	Month	6		
TOTAL PAGE 24: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 25					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
25.1	Allow for extended Defects Liability Period stipulated in General Conditions of Contract (Provisional). Rate only	Month	12		
25.2	Allow for all costs for the Engineer or an Independent Inspector delegated by the Engineer to carry out an independent inspection during manufacture of the plant and equipment in accordance with General Conditions of Contract	Item	Lump Sum		
25.3	Allow for provision of all drawings and Information to be provided by the Contract or as per General Specification	item	Lump Sum		
25.4	Allow for provision of Operation and Maintenance, and Overhaul Manuals as per General Specification	Item	Lump Sum		
25.5	Allow for provision of ali 'As Fitted' drawings as per General specification	Item	Lump Sum		
25.6	Allow a provisional sum for the provision of spares for 5 year for the operation of the plant in accordance with General Specification section 1.1.1 and Particular specification section 2.7.2. The Tenderer shall provide a list of the spares with each Item individually priced and the total cost to be carried to this Item as directed by the Engineer	Item	Lump Sum	25,000,000.00	25,000,000.00
25.7	Allow for provision of all special tools necessary for the maintenance of the plant in accordance with General Specification. The Tenderer shall provide a list of the tools with each item individually priced and total cost to be carried to this Item.	Item	Lump Sum		
25.8	Allow for all expenses for complying with the General Conditions for any intervals and labour not specifically mentioned in the Bills of Quantities but necessary for the satisfactory completion and putting in service of all plant; naming the particular Item and/or Clause references and pricing separately below:- a) b) c) d) e)				
25.9	<u>Note:</u> Any cost arising from complying with the Specification, Conditions of Contract, Conditions to Tenderers, Drawings, etc., not included in this Item shall be assumed to be covered by Tender Rates CIVIL. WORKS ASSOCIATED WITH INSTALLATION OF EQUIPMENT	PC			
25.10	Excavation in common Material	m ³	50		
TOTAL PAGE 25: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 26					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
26.1	Extra over for excavation in Rock Class A	m ³	10		
26.2	-Ditto - but Rock Class 8	m ³	10		
26.3	-Ditto - but Rock Class C	m ³	5		
26.4	Formwork - Class F1	m=	100		
26.5	Formwork - Class F2	m=	100		
26.6	Formwork - Class F3	m ²	100		
26.7	Provision and placing of mass concrete Class 15/20, including vibrating and casing as specified.	m ²	50		
26.8	-Ditto - but reinforced concrete Class 20/20	m ³	10		
26.90	-Ditto - bit reinforced concrete Class 25/20	m ³	30		
26.10	Supply of Steel Reinforcement - all diameters; deformed high yield bars to BS 4449; including for cutting, bending tying, etc.	kg	2500		
26.11	Installation of Steel Reinforcement - all diameters; deformed high yield bars to BS 4449; including for cutting, bending tying, etc.	kg	2500		
TOTAL PAGE 26: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 27					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	KIU TREATMENT PLANT ELECTRICAL EQUIPMENT				
	Supply the following small power & lighting fittings in the Switch Room as per the specifications.				
27.1	13A Twin Socket Outlet - flush	nr	4		
27.2	Twin FL Fitting 4 FT - Batten type	nr	6		
27.3	63A TP Socket Outlet c/w Top Plug	nr	1		
27.4	32A TP Socket Outlet c/w Top Plug	nr	1		
27.5	5A Light Sw. - Flush type	nr	2		
27.6	Miscellaneous Wiring complete with Conduits / Trunking	nr	1		
	Install the following small power & lighting fittings in the Switch Room as per the specifications.				
27.7	13A Twin Socket Outlet - flush	nr	4		
27.8	Twin FL Fitting 4 FT - Batten type	nr	6		
27.9	63A TP Socket Outlet c/w Top Plug	nr	1		
27.10	32A TP Socket Outlet c/w Top Plug	nr	1		
27.11	5A Light Sw. - Flush type	nr	2		
27.12	Miscellaneous Wiring complete with Conduits / Trunking	nr	1		
	DISTRIBUTION BOARD - INLET WORKS				
27.13	Design, Supply new Distribution Board at the inlet Works, free standing or wall mounted type, complete, with the following, as per the specifications. 1 X Enclosure (weather Proof)	nr	1		
	1 X 80A TP MCCB Incomer 1 X 40A TP MCCB Feeder 2 X 32A TP MCCB Feeder 2 X 25A TP MCCB Feeder 1 X Protection Devices 1 X Common control Section 1 X Earthing System 1 x Metering Section 1 X Indications				
	DISTRIBUTION BOARD - INLET WORKS				
27.14	Install & Commission new Distribution Board at the inlet Works, free standing or wall mounted type, complete, with the following, as per the specifications. 1 X Enclosure (weather Proof)	nr	1		
	1 X 80A TP MCCB Incomer 1 X 40A TP MCCB Feeder 2 X 32A TP MCCB Feeder 2 X 25A TP MCCB Feeder 1 X Protection Devices 1 X Common control Section 1 X Earthing System 1 x Metering Section 1 X Indications				
27.15	Supply 4C x 10mm2 Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Incinerator House	m	100		
27.16	Install 4C x 10mm2 Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Incinerator House	m	100		
7.90	Supply 4C x 6mm2 Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Switchgear Room.	m	8		
27.17	Install 4C x 6mm2 Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Switchgear Room.	m	8		
7.10	Supply 4C x 4mm2 Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Fire Pump House.	m	40		
27.18	Install 4C x 4mm2 Pvc/Pvc/Swa/Pvc Cable from Main board to Distribution Board at Fire Pump House.	m	40		
27.19	Allow for application, follow up, payment for electricity connection charges. It is estimated the load for the water treatment works and pumping sets will be about 100KVA	Item	ump Sum		
27.20	Supply 50 KVA, 400V, 50HZ, Standby Generator With Canopy Complete with ATS and Base Tank as Perkins or Cummins or approved equivalent.	Item	1		

27.21	Install and Commission 50 KVA, 400V, 50HZ, Standby Generator With Canopy Complete with ATS and Base Tank as Perkins or Cummins or approved equivalent.	Item	1		
27.22	Supply 4C x 25mm2 Pvc/Pvc/Swa/Pvc Cable from the Generator to the Main Distribution Board at Switchgear Room.	m	50		
27.23	Install 4C x 25mm2 Pvc/Pvc/Swa/Pvc Cable from the Generator to the Main Distribution Board at Switchgear Room.	m	50		
27.24	Supply 4C x 2.5mm2 Pvc/Pvc/Swa/Pvc Cable from the Generator to the ATS at Switchgear Room.	m	50		
27.25	Install 4C x 2.5mm2 Pvc/Pvc/Swa/Pvc Cable from the Generator to the ATS at Switchgear Room.	m	50		
TOTAL PAGE 27: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 28					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	FIRE FIGHTING INSTALLATION				
	<u>Hosereel Installation</u> Supply the following fire fighting installation and equipment as described and shown on the contract drawings or as shall be instructed by the Engineer. Tenderers should allow for all fittings, jointings couplings including unions and clamps where necessary for the proper functioning of the installation when pricing.				
	Hosereel 20mm diameter 30m long swinging type hose reel manufactured to BS 5274, with bottom entry and complete with delivery valve, mild steel feed pipe, isolation valve, guide and all other accessories as "Angus Fire Armour" or equal and approved.	1	No.		
28.1					
28.2	GMS Pipework, Class B 25mm diameter pipework	15	lm		
28.3	50mm diameter pipework	8	lm		
	Extra Over GMS Pipework				
	Bends				
28.4	25mm diameter bend	5	No.		
	Tees				
28.5	50mm diameter equal tee	5	No.		
	Reducers				
28.6	50 x 25mm diameter reducer	5	No.		
	Valves				
28.7	25mm diameter gate valve as PEGLER or approved equivalent.	2	No.		
	Unions				
28.8	25mm diameter pipe union	2	No.		
28.9	50mm X20mm Reducer	2	No.		
28.10	50mm Sockets	5	No.		
28.11	25mm Sockets	5	No.		
28.12	20mm GI sockets	5	No.		
28.13	25mm Elbow	5	No.		
28.14	50mm GI union	5	No.		
28.15	50mm GI b/Nipple	3	No.		
28.16	25mm GI B/Nipple	3	No.		
	Standard Printed Lable				
28.17	Standard printed lables for the fire cupboards.	1	No.		
28.18	<u>Hosereel Installation</u> Install the following fire fighting installation and equipment as described and shown on the contract drawings or as shall be instructed by the Engineer. Tenderers should allow for all fittings, jointings couplings including unions and clamps where necessary for the proper functioning of the installation when pricing.				
	Hosereel 20mm diameter 30m long swinging type hose reel manufactured to BS 5274, with bottom entry and complete with delivery valve, mild steel feed pipe, isolation valve, guide and all other accessories as "Angus Fire Armour" or equal and approved.	1	No.		
28.19					
28.20	GMS Pipework, Class B 25mm diameter pipework	15	lm		
8.21	50mm diameter pipework	8	lm		
	Extra Over GMS Pipework				
	Bends				
28.22	25mm diameter bend	5	No.		
	Tees				
28.23	50mm diameter equal tee	5	No.		
	Reducers				
28.24	50 x 25mm diameter reducer	5	No.		
	Valves				
28.25	25mm diameter gate valve as PEGLER or approved equivalent.	2	No.		
	Unions				
28.26	25mm diameter pipe union	2	No.		
28.27	50mm X20mm Reducer	2	No.		
28.28	50mm Sockets	5	No.		
28.29	25mm Sockets	5	No.		
28.30	20mm GI sockets	5	No.		
28.31	25mm Elbow	5	No.		
28.32	50mm GI union	5	No.		
28.33	50mm GI b/Nipple	3	No.		
28.34	25mm GI B/Nipple	3	No.		
	Painting Allow for painting of the hosereel installation with 2 coats of super gloss paint on a primer coat s per F.O.C rules, 29th Edition with latest ammendments and to the approval of the Project Engineer.	1	item		
28.35					
TOTAL PAGE 28: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 29					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
29.1	Hosereel Pumpset Supply Hosereel pumpset, one duty, the other standby mounted on a frame with a mild steel base plate. Each pump shall have a duty 3m ³ /hr. against 40m head as DAYLIFF DFS2 Model DB 4-60, 1.45X 1PH Power or approved equivalent. In addition, there shall be a 48 litres diaphragm pressure vessel (as Varem or approved equivalent), pressure switches, a switch to protect dry run, 50mm foot valve and strainer, tank connections, gate valves and non-return valves. The pressure set to be as Dayliff or equal and approved. Control shall be effected via a pressure switch through a pre-wired control panel which shall give automatic change-over from duty to standby pump within 5 seconds should the duty pump fail to deliver for any reason. The pumpset shall include all non-returns valves, timer, isolating valves and pipe connections.	1	Set		
29.2	Installation and testing of Hosereel pumpset, one duty, the other standby mounted on a frame with a mild steel base plate. Each pump shall have a duty 3m ³ /hr. against 40m head as DAYLIFF DFS2 Model DB 4-60, 1.45X 1PH Power or approved equivalent. In addition, there shall be a 48 litres diaphragm pressure vessel (as Varem or approved equivalent), pressure switches, a switch to protect dry run, 50mm foot valve and strainer, tank connections, gate valves and non-return valves. The pressure set to be as Dayliff or equal and approved. Control shall be effected via a pressure switch through a pre-wired control panel which shall give automatic change-over from duty to standby pump within 5 seconds should the duty pump fail to deliver for any reason. The pumpset shall include all non-returns valves, timer, isolating valves and pipe connections.	1	Set		
29.3	Supply of 5,000 litres capacity heavy duty plastic cylindrical water storage tank with 1,830mm dia by 2,080mm height in Plinth/slab complete with cover and screwed connections for inlet (25mm), outlets (50mm), overflow (32mm). Allow for the connection fittings to/from the tank as TOP TANK or equal and approved.	1	No.		
29.4	Install 5,000 litres capacity heavy duty plastic cylindrical water storage tank with 1,830mm dia by 2,080mm height in Plinth/slab complete with cover and screwed connections for inlet (25mm), outlets (50mm), overflow (32mm). Allow for the connection fittings to/from the tank as TOP TANK or equal and approved.	1	No.		
29.5	Carbon Dioxide Gas Fire Extinguisher 5kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	1	No		
29.6	5kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	1	No		
29.7	Dry Chemical Powder Fire Extinguisher 6kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	1	No		
29.8	6kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	1	No		
29.9	Manual Alarm Bell 9" (225mm) manual operated alarm bell (Gong)	1	No		
29.10	9" (225mm) manual operated alarm bell (Gong)	1	No		
29.11	Supply mass burn two stage rotary kiln incinerator capable of burning 3 tons of waste per day. The unit to be supplied with a 3 cubic metre hopper and a solar heated pre combustion drying. To unit supplied shall come complete with flue gasconditioning and before entering a bag filter. The inner diameterof shell shall be about 2m and lenth 8m (or as per Manufacturer/Brand).The kiln temperature shall be 850-1000 degrees celsius. The surface temperature of kiln shall be about 180 degrees celsius. The drive mode shall be single direction gear with possibility of reverse for maintenance.	nr	1		
29.12	Install mass burn two stage rotary kiln incinerator capable of burning 3 tons of waste per day. The unit to be supplied with a 3 cubic metre hopper and a solar heated pre combustion drying. To unit supplied shall come complete with flue gasconditioning and before entering a bag filter. The inner diameterof shell shall be about 2m and lenth 8m (or as per Manufacturer/Brand).The kiln temperature shall be 850-1000 degrees celsius. The surface temperature of kiln shall be about 180 degrees celsius. The drive mode shall be single direction gear with possibility of reverse for maintenance. As detailed in particular specifications for incinerator 3.3	nr	1		
29.13	STREET LIGHTING Supply New Lighting fixtures 150W LED or Approved Equivalent, on the existltn street light poles.	nr	12		
29.14	Install New Lighting fixtures 150W LED or Approved Equivalent, on the existltn street light poles.	nr	12		
29.15	Supply new additional Street Light Column complete with 6A SP MCB & Light Fixures 150W LED or Approved Equivalent at various plant locations.	nr	12		

29.16	Install new additional Street Light Column complete with 6A SP MCB & Light Fixures 150W LED or Approved Equivalent at various plant locations.	nr	12		
29.17	Supply 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable under ground for new Street Light Columns	m	500		
29.18	Install 3 Core x 1.5 mm ² PVC/Pvc/Swa/PVc Cable under ground for new Street Light Columns	m	500		
29.19	Allow a Provisional Sum of Kshs 250,000 for Supply and Installation of Earthing System	Item	LS		
29.20	Supply fixed Hydrogen Sulphide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
29.21	Install Commissioning fixed Hydrogen Sulphide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
29.22	Supply, Install Commissioning fixed Carbon Monoxide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
29.23	Install Commissioning fixed Carbon Monoxide Gas Detector to specifications complete with both audio and optical alarm, led screen, wiring to the SCADA system. Allow for all accessories and parts to ensure the system works as intended.	nr	2		
TOTAL PAGE 29: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 30					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	CONTROL ROOM MECHANICAL PLUMBING, DRAINAGE, FIRE FIGHTING AND AIR CONDITIONING INSTALLATIONS SANITARY FITTINGS <u>Supply the following</u> Supply the following sanitary appliances complete with all the connections to services, waste, jointing to supply overflows and plugging and screwing to the floors. Where trade names are mentioned below, the reference is intended to be as a guide to the type of fitting.				
30.1	Supply White Vitreous China Close coupled Washdown WC suite complete with seat, cover, low level cistern with dual flush button on top, fittings, bracket set as Twyford or equal and approved.	4	No.		
	WASHHAND BASINS Supply White glazed vitreous China wash hand basin size 500 x 460mm approved with 1 No. tapholes complete with 1 No. 15 mm diameter chrome plated Aquation, include single lever mixer tap and handle, chain waste and plastic bottle trap 32mm diameter and silicone for sealing.	10	No		
	Disabled Toilet Suite Supply The fixtures to be provided in position are:-A. For wheelchair accessible WC's 1. A WC suite with an overall projection from back wall to the front of the seat of 750mm, and a height from floor to the top of the seat of 450mm minimum to 475mm maximum. 2. A washbasin with a single control tap offset to the side of the basin nearest the WC 3. Four support rails each 600mm long with 35mm diameter rail. 4. A hinged support rail incorporating toilet roll holder for use alongside the WC with a projection of 750mm, The front of the rail must be level with front of the WC. 5. A seated user back support. 6. A mirror 900mm x 400mm. 7. Soap dispenser. 8. Coat hook. Positioning: To be as layout drawings.	2	No.		
	Toilet Roll Holder Supply As Vitreous China semi recessed toilet roll holder fixed to wall including forming the recess size of 150 x 150mm.	6	No.		
	Mirror Supply 6mm thick polished plate glass, silver backed mirror with bevelled edges, size 610x497mm plugged and screwed to wall with 4 No. Chrome plated chrome capped screws and 5mm thick foam back rest.	6	No.		
	Hand drier Supply Electric "STARMIX" automatic touch free hand drier for electrical supply compatible with 220/240V 50Hz single phase supply and to be complete with a mounting plate, centrifugal fan and motor 2700 rpm with thermal overload and radio suppression and 2100w spirally wound element with automatic re-setting thermal cut-out and wiring from local isolator	2	No.		
	URINAL BOWL Supply Urinal in approved colour vitreous china comprising 2 No. bowls and 1 No. cistern.	3	No		
30.8	Flash valve for the urinal bowl as docol or equal and approved	3	No		
30.9	Supply Shower Fittings comprising of shower rose, 2 no. 15mm water shower taps as cobra or equal and approved, piping for proper functioning.	2	No		
30.10	Supply Robe hook in Satin Aluminium to be mounted by concealed screws to wall wedges.	2	No		
	SANITARY FITTINGS <u>Install and commission the following</u> Install the following sanitary appliances complete with all the connections to services, waste, jointing to supply overflows and plugging and screwing to the floors. Where trade names are mentioned below, the reference is intended to be as a guide to the type of fitting. All installations in this section must be done in accordance with General & Particular Specifications for Plumbing and Drainage Installations. Water Closets White Vitreous China Close coupled Washdown WC suite complete with seat, cover, low level cistern with dual flush button on top, fittings, bracket set as Twyford or equal and approved.	4	No.		
	WASHHAND BASINS White glazed vitreous China wash hand basin size 500 x 460mm approved with 1 No. tapholes complete with 1 No. 15 mm diameter chrome plated Aquation, include single lever mixer tap and handle, chain waste and plastic bottle trap 32mm diameter and silicone for sealing. As "TWYFORD ADVENT" or Approved equivalent	10	No		

30.13	Disabled Toilet Suite The fixtures to be provided in position are:-A. For wheelchair accessible WC's 1. A WC suite with an overall projection from back wall to the front of the seat of 750mm, and a height from floor to the top of the seat of 450mm minimum to 475mm maximum.2. A washbasin with a single control tap offset to the side of the basin nearest the WC 3. Four support rails each 600mm long with 35mm diameter rail.4. A hinged support rail incorporating toilet roll holder for use alongside the WC with a projection of 750mm, The front of the rail must be level with front of the WC. 5. A seated user back support. 6. A mirror 900mm x 400mm.7. Soap dispenser.8. Coat hook.As Twyford Avalon WC suite or equal and approved.Positioning: To be as layout drawings.	2	No.		
30.14	Toilet Roll Holder As Vitreous China semi recessed toilet roll holder fixed to wall including forming the recess size of 150 x 150mm.	6	No.		
30.15	Mirror 6mm thick polished plate glass, silver backed mirror with bevelled edges, size 610x497mm plugged and screwed to wall with 4No. Chrome plated chrome capped screws and 5mm thick foam back rest.	6	No.		
30.16	Hand drier Electric "STARMIX" automatic touch free hand drier for electrical supply compatible with 220/240V 50Hz single phase supply and to be complete with a mounting plate, centrifugal fan and motor 2700 rpm with thermal overload and radio suppression and 2100w spirally wound element with automatic re-setting thermal cut-out and wiring from local isolator	2	No.		
30.17	URINAL BOWL Urinal in approved colour vitreous china comprising 2No. bowls and 1No. cistern. To be as Twyford's 'Camden' or approved equivalent.	3	No		
30.18	Flash valve for the urinal bowl as docol or equal and approved	3	No		
30.19	Shower Fittings comprising of shower rose, 2no. 15mm water shower taps as cobra or equal and approved, piping for proper functioning.	2	No		
30.20	Robe hook in Satin Aluminium to be mounted by concealed screws to wall wedges. To be as Twyford's Spectrum 2000 accessories or equal and approved.	2	No		
TOTAL PAGE 30: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 31					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	Supply Only				
31.1	Supply Soap Dispenser Wall mounted Soap dispenser with a capacity of about one Litre having a press action Soap release mechanism complete with fixing screws.	2	No		
31.2	Soap Dish Wall mounted Soap white dish complete with fixing screws.	2	No		
31.3	Kitchen Sink Single Bowl Single Drainer sink size 1500x500mm with bowl size 420x355x150mm deep made out of 18/8 stainless steel complete with: 1No. mixers with overarm swivel outlet, 1No. sink wastes with 70mm diameter flanges 45mm shanks with brackets, plugs and chains including 1No. P-traps.	1	No		
	INTERNAL PLUMBING-SUPPLY ONLY Supply The following CPVC PIPE PN 10 tubing and fittings as described. Tenderer to allow for all sundry items e.g. reducers, clips etc in their other rates.				
31.4	40mm dia laid in roof space, trench, chased in walls or in service ducts	15	Lm.		
31.5	32mm dia ditto	35	Lm.		
31.6	25mm dia ditto	25	Lm.		
	Gate Valves				
31.7	40mm dia medium pressure screw down full way non-raising stem wedge gate valve to B.S 1952 with wheel head and joints to steel tubing as Pegler or equal and approved	2	No.		
31.8	32mm dia ditto	2	No.		
31.9	25mm dia ditto	2	No.		
31.10	Non return valves 40mm	1	No.		
	Bends/Elbows CPVC				
31.11	40mm dia ditto	15	No.		
31.12	32mm dia ditto	35	No.		
31.13	25mm dia ditto	43	No.		
	Tees CPVC				
31.14	32x25 x32 mm dia	10	No.		
31.15	32x 25x25	20	No.		
31.16	25x25x20 mm dia	22	No.		
31.17	32mm dia	15	No.		
31.18	25mm dia	20	No.		
31.19	40mm dia adaptor elbows CPVC	6	No.		
31.20	32mm dia ditto	15	No.		
31.21	25mm dia ditto	15	No.		
31.22	40mm dia unions CPVC	2	No.		
31.23	32mm dia ditto	2	No.		
31.24	25mm dia ditto	2	No.		
31.25	40mm dia adaptor sockets	5	No.		
31.26	32mm dia ditto	15	No.		
31.27	25mm dia ditto	15	No.		
31.28	40mm plain sockets	5	No.		
31.29	32mm dia ditto	20	No.		
31.30	25mm dia ditto	25	No.		
31.31	40mm G I Backnuts	4	No.		
31.32	32mm ditto	4	No.		
31.33	25mm ditto	2	No.		
31.34	40mm G I union	2	No.		
31.35	40x32mm dia Reducing bush	4	No.		
31.36	20x15mm dia ditto	12	No.		
31.37	40x32mm dia ditto	5	No.		
31.38	32x25mm dia ditto	7	No.		
	Fix Only				
31.39	Soap Dispenser Wall mounted Soap dispenser with a capacity of about one Litre having a press action Soap release mechanism complete with fixing screws. As Starmix or approved equivalent.	2	No		
31.40	Soap Dish Wall mounted Soap white dish complete with fixing screws. As Starmix or approved equivalent	2	No		
31.41	Kitchen Sink Single Bowl Single Drainer sink size 1500x500mm with bowl size 420x355x150mm deep made out of 18/8 stainless steel complete with: 1No. mixers with overarm swivel outlet, 1No. sink wastes with 70mm diameter flanges 45mm shanks with brackets, plugs and chains including 1No. P-traps. Sink shall be as "Dali stainless steel sink" or approved equal	1	No		
31.42	INTERNAL PLUMBING-FIX ONLY Fix The following CPVC PIPE PN 10 tubing and fittings as described. Tenderer to allow for all sundry items e.g. reducers, clips etc in their other rates.				
31.43	40mm dia laid in roof space, trench, chased in walls or in service ducts	15	Lm.		
31.44	32mm dia ditto	35	Lm.		
31.45	25mm dia ditto	25	Lm.		
	Gate Valves				
31.46	40mm dia medium pressure screw down full way non-raising stem wedge gate valve to B.S 1952 with wheel head and joints to steel tubing as Pegler or equal and approved	2	No.		
31.47	32mm dia ditto	2	No.		
31.48	25mm dia ditto	2	No.		
31.49	Non return valves 40mm	1	No.		
	Bends/Elbows CPVC				
31.50	40mm dia ditto	15	No.		
31.51	32mm dia ditto	35	No.		
31.52	25mm dia ditto	43	No.		
	Tees CPVC				
31.53	32x25 x32 mm dia	10	No.		
31.54	32x 25x25	20	No.		
31.55	25x25x20 mm dia	22	No.		
31.56	32mm dia	15	No.		
31.57	25mm dia	20	No.		

31.58	40mm dia adaptor elbows CPVC	6	No.		
31.59	32mm dia ditto	15	No.		
31.60	25mm dia ditto	15	No.		
31.61	40mm dia unions CPVC	2	No.		
31.62	32mm dia ditto	2	No.		
31.63	25mm dia ditto	2	No.		
31.64	40mm dia adaptor sockets	5	No.		
31.65	32mm dia ditto	15	No.		
31.66	25mm dia ditto	15	No.		
31.67	40mm plain sockets	5	No.		
31.68	32mm dia ditto	20	No.		
31.69	25mm dia ditto	25	No.		
31.70	40mm G I Backnuts	4	No.		
31.71	32mm ditto	4	No.		
31.72	25mm ditto	2	No.		
31.73	40mm G I union	2	No.		
31.74	40x32mm dia Reducing bush	4	No.		
31.75	20x15mm dia ditto	12	No.		
31.76	40x32mm dia ditto	5	No.		
31.77	32x25mm dia ditto	7	No.		
TOTAL PAGE 31: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 32					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	SUPPLY ONLY				
	Flexible tubes				
32.1	Supply 15mm x 300mm long flexible tubes c/w stainless steel back nuts	26	No.		
32.2	15mm dia angle valves	26	No.		
32.3	Allow for water points complete with 1m GI pipe, and 15mm lockable tap near the car park/garage.	4	No.		
	FOUL DRAINAGE				
	Supply the following UPVC, MUPVC, soil and waste systems respectively to B.S 5255 with fittings fixed to manufacturers printed instructions and manufactured by reputable manufacturers. All pipes and fittings in this installation shall be UPVC to B.S 4660 and B.S 4515. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc 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. The installation must comply with B.S 5572.				
	Pipes				
32.4	100mm diameter heavy gauge grey upvc pipes	18	Lm		
32.5	100mm diameter heavy gauge golden brown uPVC pipes	30	Lm		
32.6	50mm ditto	20	Lm		
32.7	40mm ditto	12	Lm		
32.8					
	Elbows				
32.8	100mm dia sweep bends	10	No.		
32.9	50mm dia ditto	8	No.		
32.10	40mm dia ditto	12	No.		
	Tees				
32.11	100mm dia	4	No.		
32.12	50mm dia ditto	12	No.		
32.13	40mm dia ditto	8	No.		
	Access/Rodding Elbow				
32.14	100mm dia	6	No.		
32.15	50mm	2	No.		
32.16	40mm	2	No.		
	Cross tee				
32.17	100mm dia	2	No.		
	Access Tee				
32.18	100mm dia	2	No.		
	Weathering Slate/Vent Cowl				
32.19	100mm diameter weathering slate, apron and vent cowl.	2	No.		
32.20	100mm WC Connector	6	No.		
	Floor Traps				
32.21	100x 50mm 2 way trapped floor trap and grating	6	No		
	Waste uPVC plugs				
32.22	100mm dia	8	No.		
	Boss Connectors				
32.23	100x50mm ditto	7	No.		
32.24	100x40mm ditto	7	No.		
	FIX ONLY				
	Flexible tubes				
32.25	Install 15mm x 300mm long flexible tubes c/w stainless steel back nuts	26	No.		
32.26	15mm dia angle valves	26	No.		
32.27	Allow for water points complete with 1m GI pipe, and	4	No.		
32.28	15mm lockable tap near the car park/garage.				

Install and commission the following UPVC, MUPVC, soil and waste systems respectively to B.S 5255 with fittings fixed to manufacturers printed instructions and manufactured by reputable manufacturers. All pipes and fittings in this installation shall be UPVC to B.S 4660 and B.S 4515. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc 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. The installation must comply with B.S 5572.				
Pipes				
32.29	100mm diameter heavy gauge grey upvc pipes	18	Lm	
32.30	100mm diameter heavy gauge golden brown uPVC pipes	30	Lm	
32.31	50mm ditto	20	Lm	
32.32	40mm ditto	12	Lm	
32.33				
Elbows				
32.33	100mm dia sweep bends	10	No.	
32.34	50mm dia ditto	8	No.	
32.35	40mm dia ditto	12	No.	
32.36				
Tees				
32.36	100mm dia	4	No.	
32.37	50mm dia ditto	12	No.	
32.38	40mm dia ditto	8	No.	
32.39				
Access/Rodding Elbow				
32.39	100mm dia	6	No.	
32.40	50mm	2	No.	
32.41	40mm	2	No.	
32.42	100mm dia	2	No.	
Access Tee				
32.43	100mm dia	2	No.	
Weathering Slate/Vent Cowl				
32.44	100mm diameter weathering slate, apron and vent cowl.	2	No.	
100mm WC Connector		6	No.	
Floor Traps				
32.45	100x 50mm 2 way trapped floor trap and grating	6	No	
Waste uPVC plugs				
32.46	100mm dia	8	No.	
0.01				
Boss Connectors				
32.47	100x50mm ditto	7	No.	
32.48	100x40mm ditto	7	No.	
TOTAL PAGE 32: TO COLLECTION SUMMARY PAGE				

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 33					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	SUPPLY ONLY				
33.1	Supply Set of 1No. 40 kg gas cylinders complete with universal regulators,ball lever valves with 32mm dia class C Steel Manifold pipe 1500mm long and Copper tubings for regulators interconnection from gas cylinders to Manifold and main shut off valve on supply pipe to Laboratory.	No	1		
33.2	Allow for filling the gas Cylinders with Liquified Petroleum gas.	Kg.	40		
	Pipework				
	Supply galvanized mild steel tubing to BS 1387 class C and fittings to BS 143 and 1256				
33.3	15mm diameter pipe	LM	8		
	<u>Extra over GMS pipework</u>				
33.4	15mm diameter bend	No.	4		
	Tees				
33.5	15 x 15 x 15mm Diameter Tee	No.	2		
	<u>Valves (LPG Gas Cocks)</u>				
33.6	15mm ball lever operated isolating gas valve	No.	1		
33.7	6/8mm dia. Gms sockets (Nipples)	No	1		
33.8	6mm dia gas cocks	No	1		
	HOT WATER SOLAR PANEL				
33.9	Supply a 300 litre hot water solar panel complete with a 1.5Kw electric booster unit and piping to connect to the building hot water system. The hot water panel to be asGW hot water panels or equal and approved by the Engineer.	1	No		
33.10	ROOF TANKS				
	Supply the following as specified and described in the particular specifications complete with all the necessary supports, fittings and accessories, all to the satisfaction of the Engineer.				
	Water Tank				
33.11	Supply vertical closed end plastic moulded tank of capacity 5000 litres (1100 gallons) and diameter 2350 x 1260mm high. The tank to be assembled complete with cover and having screwed connections for inlet, outlet, overflow, 25mm high pressure ball valve, drain pipes and any other necessary item for its proper functioning. The tank shall be mounted on a flat roof slab and shall be as ROTO Model or approved equivalent.(For Hosereel fire fighting)	1	No.		
	FIX ONLY				
33.12	Install Set of 1No. 40 kg gas cylinders complete with universal regulators,ball lever valves with 32mm dia class C Steel Manifold pipe 1500mm long and Copper tubings for regulators interconnection from gas cylinders to Manifold and main shut off valve on supply pipe to Laboratory.	No	1		
	Pipework				
	Install galvanized mild steel tubing to BS 1387 class C and fittings to BS 143 and 1256				
33.13	15mm diameter pipe	LM	8		
	<u>Extra over GMS pipework</u>				
33.14	15mm diameter bend	No.	4		
	Tees				
33.15	15 x 15 x 15mm Diameter Tee	No.	2		
	<u>Valves (LPG Gas Cocks)</u>				
33.16	15mm ball lever operated isolating gas valve	No.	1		
33.17	6/8mm dia. Gms sockets (Nipples)	No	1		
33.18	6mm dia gas cocks	No	1		

33.19	<p>HOT WATER SOLAR PANEL</p> <p>Install and commission a 300 litre hot water solar panel complete with a 1.5Kw electric booster unit and piping to connect to the building hot water system. The hot water panel to be as GW hot water panels or equal and approved by the Engineer.</p> <p>ROOF TANKS</p> <p>Installation of the following as specified and described in the particular specifications complete with all the necessary supports, fittings and accessories, all to the satisfaction of the Engineer.</p> <p>Water Tank</p>	1	No		
33.20	<p>Install vertical closed end plastic moulded tank of capacity 5000 litres (1100 gallons) and diameter 2350 x 1260mm high. The tank to be assembled complete with cover and having screwed connections for inlet, outlet, overflow, 25mm high pressure ball valve, drain pipes and any other necessary item for its proper functioning. The tank shall be mounted on a flat roof slab and shall be as ROTO Model or approved equivalent.(For Hosereel fire fighting)</p>	1	No.		
TOTAL PAGE 33: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 34					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	EXTERNAL WATER RETICULASTIONS WORKS Supply CPVC-PN20 pipes and fittings as described and shown on the drawings. 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, crossovers, couplings, clippings, connectors, joints etc. 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.				
	CPVC PN20 PIPEWORK				
34.1	50mm diameter pipework	25	Lm		
34.2	40mm diameter pipework	30	Lm		
34.3	32mm diameter pipework	1	Lm		
	Extra over tubing for:				
	Bends				
34.4	32mm diameter bend	6	No.		
34.5	40mm diameter bend	10	No.		
34.6	50mm diameter bend	10	No.		
	Tees				
34.7	32mm diameter equal tee	8	No.		
34.8	40mm diameter equal tee	6	No.		
34.9	50mm diameter equal tee	6	No.		
	Reducers				
34.10	32 x 40mm diameter reducer socket	4	No.		
34.11	40 x 50mm diameter reducer socket	5	No.		
34.12	32 x 50mm diameter reducer socket	6	No.		
	Gate Valves				
34.13	50mm diameter ditto	2	No.		
34.14	40mm diameter ditto	2	No.		
34.15	32mm diameter ditto	1	No.		
	Pipe Sockets				
34.16	50mm diameter ditto	15	No.		
34.17	40mm diameter ditto	18	No.		
34.18	32mm diameter ditto	2	No.		
	Male/Female Brass Threaded Adapters/Transition fittings.				
34.19	50mm diameter ditto	6	No.		
34.20	40mm diameter ditto	4	No.		
34.21	32mm diameter ditto	4	No.		
	Water Booster Pump Set				
34.22	Duty and standby Grundfos automatic water pumpset doing 2m3/h against ahead of 20m head complete with 60l pressure vessels, pressure switches, gauges and control panel. Panel to be from standard anodized sheet metal and to contain visual indicators, protection relays, voltmeter, ammeter auto manual selection switch etc. Other components in pump assembly are 1 level set for low level float switches dry run cut out, 1 set of electrical system time delay switch etc. Tenderer to note that panels wiring diagram will require Engineer's approval prior to its fabrication. The tenderer is also to allow for fabrication of a pump housing as shown in the drawings. The supply must come complete with all the valves, fittings required to make the system work as intended.	1	Set		
	FIX ONLY				
	EXTERNAL WATER RETICULASTIONS WORKS Install and test CPVC-PN20 pipes and fittings as described and shown on the drawings. 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, crossovers, couplings, clippings, connectors, joints etc. 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.				
	CPVC PN20 PIPEWORK				
34.23	50mm diameter pipework	25	Lm		
34.24	40mm diameter pipework	30	Lm		
34.25	32mm diameter pipework	1	Lm		
	Extra over tubing for:				
	Bends				
34.26	32mm diameter bend	6	No.		
34.27	40mm diameter bend	10	No.		
34.28	50mm diameter bend	10	No.		
	Tees				
34.29	32mm diameter equal tee	8	No.		
34.30	40mm diameter equal tee	6	No.		
34.31	50mm diameter equal tee	6	No.		

	Reducers				
34.32	32 x 40mm diameter reducer socket	4	No.		
34.33	40 x 50mm diameter reducer socket	5	No.		
34.34	32 x 50mm diameter reducer socket	6	No.		
	Gate Valves				
34.35	50mm diameter ditto	2	No.		
34.36	40mm diameter ditto	2	No.		
34.37	32mm diameter ditto	1	No.		
	Pipe Sockets				
34.38	50mm diameter ditto	15	No.		
34.39	40mm diameter ditto	18	No.		
34.40	32mm diameter ditto	2	No.		
	Male/Female Brass Threaded Adapters/Transition fittings.				
34.41	50mm diameter ditto	6	No.		
34.42	40mm diameter ditto	4	No.		
34.43	32mm diameter ditto	4	No.		
	Water Booster Pump Set				
34.44	Install Duty and standby Grundfos automatic water pumpset doing 2m ³ /h against ahead of 20m head complete with 60l pressure vessels, pressure switches, gauges and control panel. Panel to be from standard anodized sheet metal and to contain visual indicators, protection relays, voltmeter, ammeter auto manual selection switch etc. Other components in pump assembly are 1 level set for low level float switches dry run cut out, 1 set of electrical system time delay switch etc. Tenderer to note that panels wiring diagram will require Engineer's approval prior to its fabrication. The tenderer is also to allow for fabrication of a pump housing as shown in the drawings. The supply must come complete with all the valves, fittings required to make the system work as intended.	1	Set		
TOTAL PAGE 34: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 35					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	FOUL WATER EXTERNAL DRAINAGE Supply the following UPVC, MUPVC, soil and waste systems respectively to B.S. 5255 with fittings fixed to Manufactures Printed instructions and manufactured by reputable manufacturers. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc. 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.				
35.1	MuPVC and uPVC Waste and Soil pipework 100mm diameter heavy gauge golden brown mUPVC pipe.	45	Lm		
35.2	Bends 100mm diameter sweep bend	8	No.		
35.3	Tees 100mm diameter sweep tee	4	No.		
35.4	Manhole Standard masonry 650 x 650 mm by 450mm Manhole complete with frame and heavy duty cover.	5	No.		
35.5	Gully Traps 100 x 50mm Trapped floor gully with 2 No. 40mm diameter inlet and 50mm diameter outlet c/w 150 x 150mm floor gully with 100mm diameter inlet. This is to come in 300 x 300 mm square top masonry gulley and 125mm thick concrete cover Include all necessary excavations, form work and finishing.	2	No		
35.6	Fire Fighting Equipments Portable Fire Extinguishers Supply complete with brackets and ensure fire safety certificate 4.5kg Carbon dioxide gas portable fire extinguisher c/w pressure gauge, initial charge and hanging hooks.	4	No.		
35.7	5.0kg Dry powder dioxide portable fire extinguisher c/w pressure gauge, initial charge and hanging hooks.	4	No.		
35.8	Allow for r fireball complete with holder and other fittings	1	No		
35.9	Fire Blanket 1.22m x 1.22m fire blanket; 3-layer cloth with protective vapour barrier and easy for deployment to BAFE and BSEN - 1869 approved.	1	No		
35.10	FIX ONLY FOUL WATER EXTERNAL DRAINAGE Install the following UPVC, MUPVC, soil and waste systems respectively to B.S. 5255 with fittings fixed to Manufactures Printed instructions and manufactured by reputable manufacturers. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc. 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.				
35.11	MuPVC and uPVC Waste and Soil pipework 100mm diameter heavy gauge golden brown mUPVC pipe.	45	Lm		
35.12	Bends 100mm diameter sweep bend	8	No.		
35.13	Tees 100mm diameter sweep tee	4	No.		
35.14	Manhole Standard masonry 650 x 650 mm by 450mm Manhole complete with frame and heavy duty cover.	5	No.		
35.15	Gully Traps 100 x 50mm Trapped floor gully with 2 No. 40mm diameter inlet and 50mm diameter outlet c/w 150 x 150mm floor gully with 100mm diameter inlet. This is to come in 300 x 300 mm square top masonry gulley and 125mm thick concrete cover Include all necessary excavations, form work and finishing.	2	No		
35.16	Allow for Testing and commissioning of the entire Plumbing and Drainage System to the Engineer's Approval	1	Item		
	Fire Fighting Equipments				

Portable Fire Extinguishers					
Supply complete with brackets and ensure fire safety certificate					
35.17	4.5kg Carbon dioxide gas portable fire extinguisher c/w pressure gauge, initial charge and hanging hooks.	4	No.		
35.18	5.0kg Dry powder dioxide portable fire extinguisher c/w pressure gauge, initial charge and hanging hooks.	4	No.		
35.19	Allow for r fireball complete with holder and other fittings	1	No		
35.20	Fire Blanket 1.22m x 1.22m fire blanket; 3-layer cloth with protective vapour barrier and easy for deployment to BAFE and BSEN - 1869 approved as Kidde or equal and approved.	1	No		
TOTAL PAGE 35: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 36					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	SPLIT AIR CONDITIONING SYSTEM Supply the following air conditioning installations complete with the associated accessories. Split Air Conditioning for Server Rooms. 7kw (24,000Btu/h) wall mounted split air conditioner complete with support brackets.The indoor unit shall be installed on highwall.It shall have microprocessor controls that monitor status of unit components and environmental parameters like temperature and humidity.It shall be equipped with a signalling alarm to indicate deterioration of conditions,Electronic expansion valve, a status display panel and all other necessary control devices.It shall operate on R410 refrigerant or any other non ozone depleting refrigerant and shall be Energy Star Rated.The unit shall be as LG type or approved equivalent. Include mounting Brackets as necessary.	1	No		
36.1					
36.2	18000 Btu/h ditto at Meeting.	1	No		
36.3	12000 Btu/h ditto at Supervisor's Office, Reception and Monitoring room	3	No		
	Refrigeration Pipework Refrigeration pipework including 25mm Amaflex insulation for both the liquid and gas lines.	55	Lm		
36.4					
	Refrigerant Allow R410A refrigerant for charging air conditioning system.	1	Item		
36.5					
	Drainage Pipework 25mm PVC condensate drainage pipework including bends, clips, joints and tees in the running lengths of the pipe.	25	LM		
36.6					
	Surge Protector Power protection unit as Solatek or equal and approved.	5	No		
36.7					
	Mounting Bracket Mounting bracket for the outdoor unit complete with a cage and provided with purpose-made protective steel iron angle frame and all other anchoring accessories including rawl bolts and anti-vibration rubber mountings to engineer's approval.	5	No		
36.8					
36.9	Supply 300mm x 50mm G I Trays for the pipe work complete with support brackets, hangers and fixtures.	LM	50		
	FIX ONLY SPLIT AIR CONDITIONING SYSTEM Install the following air conditioning installations complete with the associated accessories. Split Air Conditioning for Server Rooms. 7kw (24,000Btu/h) wall mounted split air conditioner complete with support brackets.The indoor unit shall be installed on highwall.It shall have microprocessor controls that monitor status of unit components and environmental parameters like temperature and humidity.It shall be equipped with a signalling alarm to indicate deterioration of conditions,Electronic expansion valve, a status display panel and all other necessary control devices.It shall operate on R410 refrigerant or any other non ozone depleting refrigerant and shall be Energy Star Rated.The unit shall be as LG type or approved equivalent. Include mounting Brackets as necessary.	1	No		
36.10					
36.11	18000 Btu/h ditto at Meeting.	1	No		
36.12	12000 Btu/h ditto at Supervisor's Office, Reception and Monitoring room	3	No		
	Refrigeration Pipework Refrigeration pipework including 25mm Amaflex insulation for both the liquid and gas lines.	55	Lm		
36.13					
	Refrigerant Allow R410A refrigerant for charging air conditioning system.	1	Item		
36.14					
	Drainage Pipework 25mm PVC condensate drainage pipework including bends, clips, joints and tees in the running lengths of the pipe.	25	LM		
36.15					
	Surge Protector				

36.17	Power protection unit as Solatek or equal and approved.	5	No		
	Mounting Bracket				
36.18	Mounting bracket for the outdoor unit complete with a cage and provided with purpose-made protective steel iron angle frame and all other anchoring accessories including rawl bolts and anti-vibration rubber mountings to engineer's approval.	5	No		
36.19	Install 300mm x 50mm G I Trays for the pipe work complete with support brackets, hangers and fixtures.	LM	50		
36.20	Allow for Hoisting the Outdoor A/C UnitS to Roof Floor and Installing in the Plant Area allocated	Item	1		
36.21	Allow for Pressure Testing, Vacuuming and Refrigerant Charging	Item	1		
36.22	Allow for Testing and Commissioning of the System	Item	1		
TOTAL PAGE 36: TO COLLECTION SUMMARY PAGE					

ELECTRO MECHANICAL WORKS PHASE TWO - BILL NO. 37					
ITEM No.	DESCRIPTION	UNIT	QTY	RATE (Kshs)	AMOUNT (Kshs)
	CONTROL ROOM ELECTRICAL INSTALLATIONS				
37.1	Supply 12 way TPN Sub-distribution board (SDB-1), flush mounted, with 100A TP mainswitch as manufactured by crabtree with lockable door consisting of: -4 pc MCB of 32A, 3-ph - 10 pcs MCB of 8A, 1-ph - 10 pc MCB of 32A, 1-ph - 6 pcs reserve place, 1-ph,complete	No	1		
37.2	Install 12 way TPN Sub-distribution board (SDB-1), flush mounted, with 100A TP mainswitch as manufactured by crabtree with lockable door consisting of: -4 pc MCB of 32A, 3-ph - 10 pcs MCB of 8A, 1-ph - 10 pc MCB of 32A, 1-ph - 6 pcs reserve place, 1-ph,complete	No	1		
	Lighting				
	Light fittings complete with accessories, lamps and tubes, 1.5 mm² three core heat resisting cables and wiring to an adjacent lighting point (measured separately) and fixing				
37.3	Lighting points	No	58		
37.4	Supply 6 Amp one gang one way switch a crabtree	No	15		
37.5	Install 6 Amp one gang one way switch a crabtree	No	15		
	Lighting fittings				
37.6	Supply 50W LED Flood Light, Water Proof, 3000K, complete with Mounting Brackets as Philips or approved equivalent.	No	8		
37.7	Install 50W LED Flood Light, Water Proof, 3000K, complete with Mounting Brackets as Philips or approved equivalent.	No	8		
37.8	Supply 1200mm 2x36W Twin fluorescent Batten as Philips or approved equivalent	No	20		
37.9	Install 1200mm 2x36W Twin fluorescent Batten as Philips or approved equivalent	No	20		
37.10	Supply 12W Surface Mounted Round LED light as Philips or approved equivalent	No	30		
37.11	Install 12W Surface Mounted Round LED light as Philips or approved equivalent	No	30		
	Final sub-circuits from distribution board in cable and conduit installation comprising concealed heavy gauge PVC conduit, 2.5mm² PVC insulated copper cables, 2.5 mm² copper earthing cable including accessories and fittings				
37.12	Flush mounted socket---outlets of 32A, 1-ph, 220/240v, 50HZ, fed through Cu 3x2.5mm ² PVC insulated CU wires in 20mm conduits complete with junction boxes, connectors and accessories	No	25		
37.13	Flush mounted socket---outlets of 32A, 1-ph, 220/240v, 50HZ, fed through Cu 3x2.5mm ² PVC insulated CU wires in 20mm conduits complete with junction boxes, connectors and accessories	No	25		
	Final sub-circuit from distribution board in cable and conduit installation comprising concealed heavy gauge PVC conduit 4mm² PVC insulated copper cables, 4mm² earthing cable including accessories.				
37.14	32A, 3P+N+E power points completely wired in 4 core 4mm ² PVC/SWA/PVC copper cables drawn in trunking and runing from the distribution board to the 3 phase 32A socket outlet excluding the switched socket.	No	1		
37.15	32A, 3P+N+E power points completely wired in 4 core 4mm ² PVC/SWA/PVC copper cables drawn in trunking and runing from the distribution board to the 3 phase 32A socket outlet excluding the switched socket.	No	1		
37.16	32A, 400V, 3P+N+E Surface mounting interlocked switched socket outlet complete with its top plug as MK Cat No. 9645 RED	No	1		
37.17	32A, 400V, 3P+N+E Surface mounting interlocked switched socket outlet complete with its top plug as MK Cat No. 9645 RED	No	1		
	CABLING WORKS				
37.18	Supply 4C x 25mm ² Pvc/Pvc/Swa/Pvc Cable from the LV Board "LV Phase 1" at the New Control Room to Distribution Board DB 'C' at the Control Room.	m	20		
37.19	Install 4C x 25mm ² Pvc/Pvc/Swa/Pvc Cable from the LV Board "LV Phase 1" at the New Control Room to Distribution Board DB 'C' at the Control Room.	m	20		
37.20	Supply and install Galvanized cable trays 200 x 50 x 1.2mm Thick as Nationwide Electrical Industries Ltd Manufactured or equal and approved.	m	120		
37.21	Install Galvanized cable trays 200 x 50 x 1.2mm Thick as Nationwide Electrical Industries Ltd Manufactured or equal and approved.	m	120		
37.22	Supply and install Galvanized Powder cable trays 200 x 50 x 3.0mm Thick Complete with Knock out Plates, as Schnider Electric Ltd Manufactured or equal and approved.	m	150		

37.23	Install Galvanized Powder cable trays 200 x 50 x 3.0mm Thick Complete with Knock out Plates, as Schnider Electric Ltd Manufactured or equal and approved.	m	150		
TOTAL PAGE 37: TO COLLECTION SUMMARY PAGE					
TOTAL BILL CARRIED FORWARD TO SUMMARY SHEET					