



**KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE**

**THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED  
RESEARCH, TECHNOLOGY AND INNOVATION  
LABORATORIES AND RELATED INFRASTRUCTURE ON  
PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B',  
NAIROBI**

**TENDER FOR BOILER (STEAM AND HOT WATER  
GENERATION) AND INCINERATOR INSTALLATION**

**TENDER REF NO: KIRDI 02/2026/2027**

**(FINANCIAL PROPOSAL)**

**Client**

Kenya Industrial Research and Development Institute (KIRDI)  
Popo Road, Off Mombasa Road,  
O. Box 30650-00100, Nairobi, Kenya  
Tel. +254-724 214 092  
Email: [directorgeneral@kirdi.go.ke](mailto:directorgeneral@kirdi.go.ke)  
Website: [www.kirdi.go.ke](http://www.kirdi.go.ke)

**Architects and Project Managers**

Habitech Consultants  
P.O.Box 66495 – 00800  
Nairobi, Kenya

**Quantity Surveyors**

M and M Construction Consultants  
P.O.Box 4677 – 00506  
Nairobi

**Structural / Civil Engineers**

Multiscope Consulting Engineers Ltd  
P.O.Box 12012 – 00100  
Nairobi

**Mechanical services Engineer**

EMS Consultants Ltd  
P.O.Box 11743 – 00100  
Nairobi

**Electrical Services Engineer**

Gedox Associates Ltd  
P.O.Box 64441 – 00620  
Nairobi

**Environment management & physical planners**

Prof. George N. Njuguna & associates  
P.O.Box 26442-00504,  
Nairobi

**SUBMISSION DATE: On or before 14<sup>th</sup> August, 2026, 11.00 AM (East African Time)**

**TENDER DOCUMENTS FOR THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED RESEARCH, TECHNOLOGY AND INNOVATION LABORATORIES AND RELATED INFRASTRUCTURE ON PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B', NAIROBI.**

**BOILER (STEAM AND HOT WATER GENERATION) AND INCINERATOR INSTALLATION.**

1) NAME AND CONTACT ADDRESSES OF PROCURING ENTITY

Kenya Industrial Research and Development Institute (KIRDI)  
Popo Road, Off Mombasa Road,  
P. O. Box 30650-00100, Nairobi, Kenya  
Tel. +254-724 214 092  
Email: [directorgeneral@kirdi.go.ke](mailto:directorgeneral@kirdi.go.ke)  
Website: [www.kirdi .go.ke](http://www.kirdi.go.ke)

2) Invitation to Tender (ITT) No: **KIRDI 02/2026/2027**

3. Tender Name: THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED RESEARCH, TECHNOLOGY AND INNOVATION LABORATORIES AND RELATED INFRASTRUCTURE ON PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B', NAIROBI

**BOILER (STEAM AND HOT WATER GENERATION) AND INCINERATOR INSTALLATION.**

**PROCURING ENTITY: KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE (KIRDI)**

**CONTRACT NAME AND DESCRIPTION:** THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED RESEARCH, TECHNOLOGY AND INNOVATION LABORATORIES AND RELATED INFRASTRUCTURE ON PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B', NAIROBI –

**BOILER (STEAM AND HOT WATER GENERATION) AND INCINERATOR INSTALLATION**

1. Tendering will be conducted under open competitive method using a standardized tender document. Tendering is open to Contractors Registered in the appropriate \*Category for Builders Works (**NCA category 2 and above**)\*. The tender is open to those who meet the requirements of eligibility as contained in this invitation and the tender documents
2. A complete set of tender documents may be obtained, downloaded and viewed by interested tenderers for free from the website [www.kirdi.go.ke/](http://www.kirdi.go.ke/) or Public Procurement Information Portal [www.tenders.go.ke](http://www.tenders.go.ke). Tenderers who download the tender document **MUST** forward their particulars immediately to the [directorgeneral@kirdi.go.ke](mailto:directorgeneral@kirdi.go.ke) to facilitate any further clarifications or addendum that may be issued.

Note that failure to email the contract information will lead to automatic disqualification at the preliminary stage. Further clarifications and Addendum shall be posted at [www.kirdi.go.ke/](http://www.kirdi.go.ke/) and Public Procurement Information Portal [www.tenders.go.ke](http://www.tenders.go.ke).

3. Tenders shall be quoted be in Kenya Shillings and shall include all taxes. Tenders shall remain valid **for 180 days** from the date of opening of tenders.
4. All Tenders must be accompanied by a by a **Tender Security as specified in the Tender Data Sheet Clause ITT 19.1.**
5. The Tenderer **shall** chronologically serialize all pages of the tender documents submitted in the numerical format i.e., 1, 2, 3, 4 ..... including the cover page. Tender Document must be tape bound and not Spiral bound. Spiral bound documents shall be automatically disqualified.
6. Completed tenders must be delivered to the address below on or before **14<sup>th</sup> August, 2026, 11.00 AM . (East African Time)**. Electronic Tenders **will not** be permitted.
7. Tenders will be opened immediately after the deadline date and time specified above or any deadline date and times specified later. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below.
8. Late tenders will be rejected.
9. The addresses referred to above are:

**A. Address for obtaining further information**

**Kenya Industrial Research and Development Institute (KIRDI)**  
**Popo Road, Off Mombasa Road,**  
**P. O. Box 30650-00100, Nairobi, Kenya**  
**Tel. +254-724 214 092**  
**Email: [directorgeneral@kirdi.go.ke](mailto:directorgeneral@kirdi.go.ke)**  
**Website: [www.kirdi.go.ke](http://www.kirdi.go.ke)**

**B. Address for Submission of Tenders.**

**Kenya Industrial Research and Development Institute (KIRDI)**  
**Popo Road, Off Mombasa Road,**  
**P.O. Box 30650-0100,**  
**Nairobi, Kenya**

Tel. +254-724 214 092

Email: [directorgeneral@kirdi.go.ke](mailto:directorgeneral@kirdi.go.ke)

Website: [www.kirdi.go.ke](http://www.kirdi.go.ke)

**C. Address for Opening of Tenders.**

**Kenya Industrial Research and Development Institute (KIRDI)**

**Popo Road, Off**

**Mombasa Road**

-----  
**Name: Designation: Director General**

**Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

## 6. FORM OF TENDER

### **INSTRUCTIONS TO TENDERERS**

- i) *All italicized text is to help the Tenderer in preparing this form.*
- ii) *The Tenderer must prepare this Form of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address. Tenderers are reminded that this is a mandatory requirement.*
- iii) *Tenderer must complete and sign CERTIFICATE OF INDEPENDENT TENDER DETERMINATION and the SELF DECLARATION FORMS OF THE TENDERER as listed under (xxii) below.*

**Date of this Tender submission:**.....[insert date (as day, month and year) of Tender submission]

**Tender Name and Identification:**.....[insert identification]

**Alternative No.:**.....[insert identification No if this is a Tender for an alternative]

To: ..... [Insert complete name of Procuring Entity]

**Date of this Tender submission:** [insert date (as day, month and year) of Tender submission] **Request for Tender No.:** [insert identification] **Name and description of Tender** [Insert as per ITT)

**Alternative No.:** [insert identification No if this is a Tender for an alternative]

**To:** [insert complete name of Procuring Entity]

Dear Sirs,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities for the execution of the above named Works, we, the undersigned offer to construct and complete the Works and remedy any defects therein for the sum<sup>1</sup> of Kenya Shillings *[[Amount in figures]*  
\_\_\_\_\_ Kenya Shillings *[amount in*  
*words]* \_\_\_\_\_

The above amount includes foreign currency<sup>2</sup> amount (s) of *[state figure or a percentage and currency]*  
*[figures]* \_\_\_\_\_ *[words]* \_\_\_\_\_

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Architect notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Special Conditions of Contract.
3. We agree to adhere by this tender until \_\_\_\_\_ *[Insert date]*, and it shall remain binding upon us and may be accepted at any time before that date.
4. We understand that you are not bound to accept the lowest or any tender you may receive.
5. We, the undersigned, further declare that:
- i) No reservations: We have examined and have no reservations to the tender document, including Addenda issued in accordance with ITT 28;
  - ii) Eligibility: We meet the eligibility requirements and have no conflict of interest in accordance with

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<sup>1</sup> This sum should be carried forward from the Summary of the Bills of Quantities.

<sup>2</sup> The percentage quoted above should not include provisional sums, and not more than two foreign currencies are allowed.

ITT 3 and 4;

- iii) Tender - Securing Declaration: We have not been suspended nor declared ineligible by the Procuring Entity based on execution of a Tender-Securing or Proposal-Securing Declaration in the Procuring Entity's Country in accordance with ITT 19.8;
- iv) Conformity: We offer to execute in conformity with the tendering documents and in accordance with the implementation and completion specified in the construction schedule, the following Works: *[insert a brief description of the Works]*;
- v) Tender Price: The total price of our Tender, excluding any discounts offered in item 1 above is: *[Insert one of the options below as appropriate]*
- vi) Option 1, incase of one lot: Total price is: *[insert the total price of the Tender in words and figures, indicating the various amounts and the respective currencies]*; or
- Option2, in case of multiple lots:
- (a) Total price of each lot *[insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies]*; and
- (b) Total price of all lots (sum of all lots) *[insert the total price of all lots in words and figures, indicating the various amounts and the respective currencies]*;
- vii) Discounts: The discounts offered and the methodology for their application are:
- viii) The discounts offered are: *[Specify in detail each discount offered.]*
- ix) The exact method of calculations to determine the net price after application of discounts is shown below: *[Specify in detail the method that shall be used to apply the discounts]*;
- x) Tender Validity Period: Our Tender shall be valid for the period specified in TDS 18.1 (as amended, if applicable) from the date fixed for the Tender submission deadline specified in TDS 22.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- xi) Performance Security: If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tendering document;
- xii) One Tender Per Tender: We are not submitting any other Tender(s) as an individual Tender, and we are not participating in any other Tender(s) as a Joint Venture member or as a sub-contractor, and meet the requirements of ITT 3.4, other than alternative Tenders submitted in accordance with ITT 13.3;
- xiii) Suspension and Debarment: We, along with any of our subcontractors, suppliers, Engineer, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Public Procurement Regulatory Authority or any other entity of the Government of Kenya, or any international organization.
- xiv) State-owned enterprise or institution: *[select the appropriate option and delete the other]* *[We are not a state- owned enterprise or institution]/[We are a state-owned enterprise or institution but meet the requirements of ITT3.8]*;
- xv) Commissions, gratuities, fees: We have paid, or will pay the following commissions, gratuities, or fees with respect to the tender process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity]*.

| Name of Recipient | Address | Reason | Amount |
|-------------------|---------|--------|--------|
|                   |         |        |        |
|                   |         |        |        |
|                   |         |        |        |

*(If none has been paid or is to be paid, indicate "none.")*

- xvi) **Binding Contract:** We understand that this Tender, together with your written acceptance there of included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;
- xvii) **Not Bound to Accept:** We understand that you are not bound to accept the lowest evaluated cost Tender, the Most Advantageous Tender or any other Tender that you may receive;
- xviii) **Fraud and Corruption:** We here by certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption; and
- xix) **Collusive practices:** We hereby certify and confirm that the tender is genuine, non-collusive and made with the intention of accepting the contract if awarded. To this effect we have signed the "Certificate of Independent Tender Determination" attached below.
- xx) We undertake to adhere by the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal, copy available from \_\_\_\_\_ (*specify website*) during the procurement process and the execution of any resulting contract.
- xxi) **Beneficial Ownership Information:** We commit to provide to the procuring entity the Beneficial Ownership Information in conformity with the Beneficial Ownership Disclosure Form upon receipt of notification of intention to enter into a contract in the event we are the successful tenderer in this subject procurement proceeding.
- xxii) We, the Tenderer, have duly completed, signed and stamped the following Forms as part of our Tender:
- a) Tenderer's Eligibility; Confidential Business Questionnaire - to establish we are no tin any conflict to interest.
  - b) Certificate of Independent Tender Determination - to declare that we completed the tender without colluding with other tenderers.
  - c) Self-Declaration of the Tenderer - to declare that we will, if awarded a contract, not engage in any form of fraud and corruption.
  - d) Declaration and commitment to the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal.
- Further, we confirm that we have read and understood the full content and scope of fraud and corruption as informed in "**Appendix 1 - Fraud and Corruption**" attached to the Form of Tender.

**Name of the Tenderer:** \*[insert complete name of person signing the Tender]

**Name of the person duly authorized to sign the Tender on behalf of the Tenderer:** \*\*[insert complete name of person duly authorized to sign the Tender]

**Title of the person signing the Tender:** [insert complete title of the person signing the Tender]

**Signature of the person named above:** [insert signature of person whose name and capacity are shown above]

**Date signed** [insert date of signing] day of [insert month], [insert year]

Date signed \_\_\_\_\_ day of \_\_\_\_\_.

Notes

\* *In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer.*

\*\**Person signing the Tender shall have the power of attorney given by the Tenderer to be attached with the Tender.*

## **SECTION F**

### **SCHEDULE OF UNIT RATES**

## SCHEDULE OF UNIT RATES

1. The tenderer shall insert unit rates against the items in the following schedules and may add such other items as he considers appropriate.
2. The unit rates shall include for supply, transport, insurance, delivery to site, storage as necessary, assembling, cleaning, installing, connecting, profit and maintenance in defects liability and any other obligation under this contract.
3. The unit rates will be used to assess the value of additions or omissions arising from authorized variations to the contract works.
4. Where trade names or manufacturer's catalogue numbers are mentioned in the specification, the reference is intended as a guide to the type of article or quality of material required. Alternative brands of **equal** and **approved** quality will be accepted.
5. The prices quoted shall be deemed to include for all obligations under the sub-contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (including **16% V.A.T and 3% Withholding tax**).

## **SECTION G**

### **BILL OF QUANTITIES**

**THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED RESEARCH, TECHNOLOGY AND INNOVATION LABORATORIES  
AND RELATED INFRASTRUCTURE ON PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B', NAIROBI**

**BILL OF QUANTITIES FOR BOILER AND INCINERATOR INSTALLATION**

| ITEM No. | DESCRIPTION                                                                                                                | UNIT | QTY | Rate (Kshs) | Amount (Kshs) |
|----------|----------------------------------------------------------------------------------------------------------------------------|------|-----|-------------|---------------|
|          | <b>PRELIMINARIES AND GENERAL CONDITIONS:</b>                                                                               |      |     |             |               |
|          | <b>Please include items which are extendable and the rate</b>                                                              |      |     |             |               |
| 1.01     | Provide bond as stated in the published conditions of subcontract                                                          | sum  |     |             |               |
| 1.02     | Provide insurance as required in the subcontract conditions                                                                | sum  |     |             |               |
| 1.03     | Prepare "As-built" drawings and manuals – 2 sets each . Scales to be 1:100 and 1:50 -soft copy to be issued in a flashdisk | sum  |     |             |               |
| 1.04     | Printing of copies of item 1.03 above.                                                                                     | sum  |     |             |               |
| 1.05     | Any other preliminary not included above-----                                                                              | sum  |     |             |               |
|          | <b>NOTE:</b><br>Vendor shall visit the site to appreciate available materials and condition.                               |      |     |             |               |
| A1       | <b>TOTAL CARRIED FORWARD TO THE SUMMARY PAGE</b>                                                                           |      |     |             | -             |

**THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED RESEARCH, TECHNOLOGY AND INNOVATION  
LABORATORIES AND RELATED INFRASTRUCTURE ON PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B',  
BILL OF QUANTITIES FOR BOILER AND INCINERATOR INSTALLATION**

| ITEM No.  | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | UNIT | QTY | Rate (Kshs) | Amount (Kshs) |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|-------------|---------------|
| 1.00      | <b><u>STEAM BOILER SYSTEM</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |     |             |               |
| 1.01      | Supply, deliver and install steam boiler, oil tank, calorifiers, pumps and associated pipework.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |     |             |               |
| 1.02      | <b><u>BOILER (Already installed)</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |     |             |               |
| 1.03      | Packaged boiler rated at 750 Kg/hour , F& A 100°C, 10 bar MCR complete with burner, controls, inlet and outlet connections, control panel, boiler mountings and fittings as described in particular specification. The burner to be as Nu-Way heavy oil burner and the packaged hot water boiler to be as packaged Ygnis steam Boiler or equal and approved.                                                                                                                                                                                                                                                                   | No.  | 0   |             |               |
| 1.04      | <b><u>BOILER CHIMNEY (Already installed)</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |             |               |
| 1.05      | Supply, deliver and install 80 meters long boiler chimney. The chimney will collect flue from each boiler as shown on contract drawings. The insulation will be 50mm thick asbestos free calcium silicate sections firmly secured to cleats on the chimney. The cleats shall be long enough to provide a minimum of 50mm air gap between the outer surface of the insulation and shall be protected by enclosing with 16 SWG aluminium sheeting with all joints overlapped and secured with pop rivets. Provide also flue temperature indicators at the boiler flue gas outlets (approximately 1 m away from boiler rear end). | No.  | 0   |             |               |
| 1.05a     | <b>Supply and install an induction smoke fan as "System air " model DVG-H400D4 rated at 2800m³/h at 250pa and 370°C.or equal and approved</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No.  | 1   |             |               |
| 1.05b     | <b>Allow for commissioning of the Boiler and chimney system already installed</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Item | 1   |             |               |
| 1.06      | <b><u>DAILY OIL SERVICE TANK</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |     |             |               |
| 1.07      | Daily oil service tank of capacity 1800 litres made of pressed steel plates and measuring 1220x1220x1220mm high complete with cover and all pipe connections, ladder, access manhole, ball valve, pressure switch, oil level indicator, low level oil override, immersion heater, heating coil and lagging as described in particular specifications.                                                                                                                                                                                                                                                                          | No.  | 0   |             |               |
| 1.07b     | <b>Allow for connection of the day fuel tank to the boiler and commissioning of the same.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Item | 1   |             |               |
| 1.08      | <b><u>OIL HEATER BATTERY</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |             |               |
| 1.09      | 6kw, 3ph, 415v oil heater battery complete with thermostat, 20 meters long electric tracing cable and switches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | No.  | 0   |             |               |
| 1.10      | <b><u>COLD WATER STORAGE TANK</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |     |             |               |
| 1.11      | Cold water storage tank of capacity 3600 litres made of pressed steel plates and measuring 2440 x 1220 x 1220mm high complete with inlets, outlets, overflow, ball valve, gate valves, pressure switch, cover, access manhole and internal and external ladder                                                                                                                                                                                                                                                                                                                                                                 | No.  | 0   |             |               |
| 1.11a     | <b>Allow for assembly and connection of the cold water storage tank to the boiler and commissioning of the same.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Item | 1   |             |               |
| <b>M1</b> | <b>TOTAL CARRIED FORWARD TO COLLECTION PAGE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |     |             |               |

| ITEM NO. | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | UNIT | QTY | RATE KSHS. | TOTAL KSHS. |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|------------|-------------|
| 1.12     | <b><u>BOILER FEED TANK</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |     |            |             |
| 1.13     | Boiler feed tank of capacity 1800 litres made of pressed steel plates and measuring 1220x1220x1220mm high complete with ladder, access manhole, ball float valve, pressure switch, overflow, level indicator, cover, strainer, non -return valve and all pipe connections.                                                                                                                                                                                                                  | No.  | 0   |            |             |
| 1.13a    | <b>Allow for assembly and connection of the boiler feed tank to the boiler and commissioning of the same.</b>                                                                                                                                                                                                                                                                                                                                                                               | Item | 1   |            |             |
| 2.00     | <b><u>TANK TOWER</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |     |            |             |
| 2.01     | Approved tank tower and its support approximately 2.5m high fabricated from mild steel complete with its ladder. The towers will be for supporting cold water feed tank and boiler feed tank.                                                                                                                                                                                                                                                                                               | No.  | 0   |            |             |
| 2.02     | Baseframe supplied in lieu of tower<br>Ditto but for supporting daily oil service tank of capacity 1800 litres.<br>Baseframe supplied in lieu of tower                                                                                                                                                                                                                                                                                                                                      | No.  | 0   |            |             |
| 2.03     | <b><u>HOT WATER CALORIFIER</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |     |            |             |
| 2.04     | A vertical storage type stainless steel steam to hot water calorifiers as "RYCROFT" of capacity 2,000 litres complete with temperature gauges, sight glass, thermostats, vent, relief valve, stop valves, non-return valves, air release valve, 3-port diverting valve with thermostat, coil supports, vessel supports and lagging all as described in the particular specification. The calorifier shell to be made from Austenitic stainless steel which shall conform to BS IS01-316 S11 | No.  | 0   |            |             |
| 2.04a    | <b>Allow for connection of the calorifiers to the boiler and commissioning of the same. This will entail supply of steam to the calorifier and return of condensate from the calorifier to the boiler feed water tank.</b>                                                                                                                                                                                                                                                                  | Item | 1   |            |             |
| 2.05     | <b><u>CIRCULATOR PUMPS</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |     |            |             |
| 2.06     | Duplicate centrifugal pipeline type hot water circulating pumps capable of delivering 20m <sup>3</sup> /h of water at 9m water gauge as GRUNDFOS Model UPS65-120 complete with electrical control system or equal and approved.                                                                                                                                                                                                                                                             | Set  | 2   |            |             |
| 2.07     | <b><u>CONTROL VALVES</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |     |            |             |
| 2.08     | 50mm diameter self acting regulator as "SPIRAX SARCO Model T25" or equal complete with type T5 sensor in copper with a brass well and a temperature range of -1 to 160 °C. The capillary length to be 3 m long or equal and approved                                                                                                                                                                                                                                                        | No   | 1   |            |             |
| 2.09     | Ditto but 40 mm diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No   | 1   |            |             |
| 2.10     | Ditto but 32 mm diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No   | 1   |            |             |
| 2.11     | 50mm diameter 3-port diverting valve with thermostat as "SPIRAX SARCO Type 58" or equal and approved.                                                                                                                                                                                                                                                                                                                                                                                       | No   | 1   |            |             |
| 2.12     | Ditto but 40 mm diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No   | 1   |            |             |
| 2.13     | Ditto but 32 mm diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No   | 1   |            |             |
| 2.14     | <b><u>PRESSURE REDUCING VALVES:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |     |            |             |
| 2.15     | 50 mm diamter Gunmetal Pressure reducing valve as "SPIRAX SARCO model BRV71 " with downstream pressure range of 3.5 to 9bar complete with accessories or equal and approved                                                                                                                                                                                                                                                                                                                 | No   | 1   |            |             |
| 2.16     | Ditto but 40 mm diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No   | 1   |            |             |
| 2.17     | Ditto but 32 mm diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No   | 1   |            |             |
| M2       | TOTAL CARRIED FORWARD TO COLLECTION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |     |            |             |

| ITEM NO.  | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | UNIT | QTY | RATE KSHS. | TOTAL KSHS. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|------------|-------------|
| 2.18      | <b>STEAM TRAPS:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |     |            |             |
| 2.19      | 15mm diameter Thermodynamic steam trap as "SPIRAX SARCO Model TDA 259" or equal and approved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | No   | 8   |            |             |
| 2.20      | 25mm diameter Ball float steam trap as "SPIRAX SARCO Model FT14-10" rated at 10 bar maximum operating pressure or equal and approved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No   | 4   |            |             |
| 2.21      | <b>STEAM MOISTURE SEPARATOR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |     |            |             |
| 2.22      | 65mm diameter moisture separator as "SPIRAX SARCO Model S3" rated at 2000kg/h at 10bar (g) or equal and approved                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No   | 1   |            |             |
| 2.23      | <b>STEAM HEADER AND ACCESSORIES:</b><br>200mm diameter steam header fabricated from schedule 40 seamless steel steam pipe complete with 1 No. 50mm diameter socket for steam inlet ;1 no.x 40mm socket for steam supply and 1 Nox 32mm socket for steam supply and 3 No 25mm diameter sockets for drain, safet valve and vent and 1 Nox 15mm diameter socket for pressure gauge fitted with the following fittings:<br>50mm diameter gate valve as Spirax Sarco or equal and approved for steam supply to the header<br>40mm gate valve as Spirax Sarco or equal and approved for steam outlet from header to the kitchen and laundry<br>32mm gate valve as Spirax Sarco or equal and approved for steam outlet from header to the calorifiers<br>15mm diameter Steam trap set comprising a steam trap as Spirax sarco, 1 No.x 15mm non return valve , 2 No. x 15mm gate valves as Spirax sarco, a site flow indicator, spiratex sensor , line strainer and pipe fittings<br>Bourden Pressure gauge (0-15 bar) and Air vent | Set  | 0   |            |             |
| 2.26      | <b>Allow for connection of the steam header to the boiler and commissioning of the same.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Item | 1   |            |             |
| 3.03      | <b>BULK STORAGE TANK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |     |            |             |
| 3.04      | Oil storage tank of capacity 10,000 litres and measuring 1500 mm diameter of mild steel welded construction complete with all pipe connections, graduated oil dip stick, visual oil level indicator, float switch, ball valve, 30 meters long float switch cable for connecting the tank with daily storage tanks, drain valve and access manhole. The tank to be above ground with steel cradle and on reinforced concrete cradles. The tank will be painted with two coats primer and two coats bituminous paint. The tank shall have a steel ladder and platform as shown on drawings.                                                                                                                                                                                                                                                                                                                                                                                                                                   | No.  | 0   |            |             |
| 2.26      | <b>Allow for connection of the bulk fuel storage tank to the boiler and commissioning of the same.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Item | 1   |            |             |
| 3.05      | <b>FUEL TRANSFER PUMP</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |     |            |             |
| 3.06      | Supply and install two fuel pumps (one duty and the other standby) as "PIUSI Model E80M " rated at 70 l/min at 2 bar ; 230v/ 50 Hz, 0.5kw; 1" BSP inlet & outlet or equal and approved<br>The pumps to be complete with motors and automatic control panel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No.  | 2   |            |             |
| <b>M3</b> | <b>TOTAL CARRIED FORWARD TO COLLECTION PAGE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |     |            |             |

| ITEM NO.  | DESCRIPTION                                                                                                                                                                                                                                                   | UNIT | QTY | RATE KSHS. | TOTAL KSHS. |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|------------|-------------|
| 3.07      | <b>HAND OIL PUMP</b>                                                                                                                                                                                                                                          |      |     |            |             |
| 3.08      | Semi-rotary type hand oil pump capable of delivering fuel oil of kinematic viscosity 30cSt at 820C ( 950 seconds Redwood no.1 at 380C) from bulk oil storage tank to the daily oil service tank. The pump to be provided with 32mm diameter pipe connections. | No.  | 0   |            |             |
| 3.09      | <b>SUMP PUMP</b>                                                                                                                                                                                                                                              |      |     |            |             |
| 3.10      | Submersible drainage water pump, capable of discharging 2.25 litres/second (8.1m3/hour) against 6.5 metres head coupled with 0.6 KW motor as "Grundfos" or approved equivalent.                                                                               | No.  | 2   |            |             |
| 3.11      | <b>PRIMARY CIRCUIT PIPEWORK</b><br><b>All Steam piping shall be black mild steel conforming to ANSI B36.10 schedule 40</b>                                                                                                                                    |      |     |            |             |
| 3.12      | Supply and install seamless black mild steel schedule 40pipes as follows:                                                                                                                                                                                     |      |     |            |             |
| 3.13      | 50mm diameter black mild steel pipe                                                                                                                                                                                                                           | LM   | 20  |            |             |
| 3.14      | 40mm dia ditto                                                                                                                                                                                                                                                | LM   | 20  |            |             |
| 3.15      | 32mm dia ditto                                                                                                                                                                                                                                                | LM   | 20  |            |             |
| 3.16      | 25mm dia ditto                                                                                                                                                                                                                                                | LM   | 400 |            |             |
| 4.00      | <b>Extra over pipework</b>                                                                                                                                                                                                                                    |      |     |            |             |
| 4.01      | <b>50mm bends</b>                                                                                                                                                                                                                                             | NO   | 10  |            |             |
| 4.02      | 40mm bends                                                                                                                                                                                                                                                    | NO   | 5   |            |             |
| 4.03      | 32mm bends                                                                                                                                                                                                                                                    | NO   | 5   |            |             |
| 4.04      | 25mm bends                                                                                                                                                                                                                                                    | NO   | 5   |            |             |
| 4.05      | <b>50mm equal tees</b>                                                                                                                                                                                                                                        | NO   | 5   |            |             |
| 4.06      | 40mm ditto                                                                                                                                                                                                                                                    | NO   | 5   |            |             |
| 4.07      | 32mm ditto                                                                                                                                                                                                                                                    | NO   | 5   |            |             |
| 4.08      | 25mm ditto                                                                                                                                                                                                                                                    | NO   | 5   |            |             |
| 4.09      | <b>50mm diameter union/ Flanges</b>                                                                                                                                                                                                                           | NO   | 4   |            |             |
| 4.10      | 40mm ditto                                                                                                                                                                                                                                                    | NO   | 4   |            |             |
| 4.11      | 32mm ditto                                                                                                                                                                                                                                                    | NO   | 4   |            |             |
| 4.12      | 50mm diameter class 150 flanged cast steel globe valve as "CRANE" model 143XU to API 623 or equal and approved                                                                                                                                                | NO   | 1   |            |             |
| 4.13      | 40mm ditto                                                                                                                                                                                                                                                    | NO   | 2   |            |             |
| 4.14      | 32mm ditto                                                                                                                                                                                                                                                    | NO   | 1   |            |             |
| 4.15      | 15mm diameter Automatic air vent as "SPIRAX SARCO Model AE50S" or equal and approved                                                                                                                                                                          | NO   | 2   |            |             |
| 4.16      |                                                                                                                                                                                                                                                               |      |     |            |             |
| 4.17      | C-shaped Bourdon pressure gauge as "GENERAL Model BSPG (dry case" to EN-87 with a range of 0 to 16 kg/cm <sup>2</sup> (Bar) with a dial diameter of 100mm or equal and approved.                                                                              | NO   | 3   |            |             |
| <b>M4</b> | <b>TOTAL CARRIED FORWARD TO COLLECTION PAGE</b>                                                                                                                                                                                                               |      |     |            |             |

| ITEM NO.  | DESCRIPTION                                                                                                                                                                                       | UNIT | QTY | RATE KSHS. | TOTAL KSHS. |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|------------|-------------|
| 4.18      | <b>LINE STRAINERS</b>                                                                                                                                                                             |      |     |            |             |
| 4.19      | 3/4 inch Bronze line strainer as "SPIRAX SARCO figure 12" or equal                                                                                                                                | NO   | 1   |            |             |
| 4.20      | 1 inch Bronze line strainer as "SPIRAX SARCO figure 12" or equal                                                                                                                                  | NO   | 1   |            |             |
| 4.21      | 1-1/4 inch Bronze line strainer as "SPIRAX SARCO figure 12" or equal                                                                                                                              | NO   | 1   |            |             |
| 4.22      | 1-1/2 inch Bronze line strainer as "SPIRAX SARCO figure 12" or equal                                                                                                                              | NO   | 1   |            |             |
| 4.23      | <b>SECONDARY CIRCUIT PIPEWORK</b>                                                                                                                                                                 |      |     |            |             |
| 4.24      | <b>HOT WATER PIPEWORK</b>                                                                                                                                                                         |      |     |            |             |
| 4.25      | Supply, deliver and install galvanised mild steel tubing to BS EN 10255:2004 with tapered pipe thread to EN 10226-1, Heavy duty (class C). Pipe fittings shall be malleable cast iron to EN 10242 |      |     |            |             |
| 4.26      | 50mm diameter galvanised mild steel pipe to BSEN 10255:2004                                                                                                                                       | LM   | 60  |            |             |
| 4.27      | 40mm ditto                                                                                                                                                                                        | LM   | 35  |            |             |
| 4.28      | 32mm ditto                                                                                                                                                                                        | LM   | 30  |            |             |
| 4.29      | 25mm ditto                                                                                                                                                                                        | LM   | 15  |            |             |
| 4.30      | 20mm ditto                                                                                                                                                                                        | LM   | 18  |            |             |
| 5.00      | <b>HOT WATER PIPEWORK INSULATION</b>                                                                                                                                                              |      |     |            |             |
| 5.01      | Supply and install 25mm thick Preformed fibre Glass insulation , and the insulation to be protected with 20gauge aluminium cladding for the following pipe sizes                                  |      |     |            |             |
| 5.02      | 50mm diameter piping                                                                                                                                                                              | LM   | 120 |            |             |
| 5.03      | 40mm ditto                                                                                                                                                                                        | LM   | 70  |            |             |
| 5.04      | 32mm ditto                                                                                                                                                                                        | LM   | 70  |            |             |
| 5.05      | 25mm ditto                                                                                                                                                                                        | LM   | 30  |            |             |
| 5.06      | 20mm ditto                                                                                                                                                                                        | LM   | 18  |            |             |
| 5.07      | <b>HOT WATER PIPE FITTINGS AND VALVES</b>                                                                                                                                                         |      |     |            |             |
| 5.08      | 50mm diameter bend                                                                                                                                                                                | NO   | 44  |            |             |
| 5.09      | 40mm Ditto                                                                                                                                                                                        | NO   | 4   |            |             |
| 5.10      | 32mm Ditto                                                                                                                                                                                        | NO   | 10  |            |             |
| 5.11      | 25mm Ditto                                                                                                                                                                                        | NO   | 14  |            |             |
| 5.12      | 20mm Ditto                                                                                                                                                                                        | NO   | 10  |            |             |
| 5.13      | 50mm diameter equal tee                                                                                                                                                                           | NO   | 4   |            |             |
| 5.14      | 40mm Ditto                                                                                                                                                                                        | NO   | 3   |            |             |
| 5.15      | 32mm Ditto                                                                                                                                                                                        | NO   | 4   |            |             |
| 5.16      | 25mm Ditto                                                                                                                                                                                        | NO   | 2   |            |             |
| 5.17      | 50 x 50 x 40mm diameter reducing tee                                                                                                                                                              | NO   | 2   |            |             |
| 5.18      | 50 x 50 x 32mm ditto                                                                                                                                                                              | NO   | 2   |            |             |
| 5.19      | 50mm diameter union                                                                                                                                                                               | NO   | 2   |            |             |
| 5.20      | 40mm Ditto                                                                                                                                                                                        | NO   | 2   |            |             |
| 5.21      | 32mm Ditto                                                                                                                                                                                        | NO   | 4   |            |             |
| 5.22      | 50 x 32mm reducer                                                                                                                                                                                 | NO   | 2   |            |             |
| 5.23      | 50mm diameter class 150 cast steel gate valve as "CRANE " Model 47XU-F to API 598 or equal and approved.                                                                                          | NO   | 1   |            |             |
| 5.24      | 40mm Ditto                                                                                                                                                                                        | NO   | 2   |            |             |
| 5.25      | 32mm Ditto                                                                                                                                                                                        | NO   | 2   |            |             |
| 5.26      | 50mm diameter plug                                                                                                                                                                                | NO   | 4   |            |             |
| 5.27      | 40mm Ditto                                                                                                                                                                                        | NO   | 2   |            |             |
| 5.28      | 50mm diameter class 150 cast steel flanged swing check valve as "CRANE" Model 147XU to API 594 or equal and approved                                                                              | NO   | 1   |            |             |
| 5.29      | 40mm Ditto                                                                                                                                                                                        | NO   | 2   |            |             |
| <b>M5</b> | <b>TOTAL CARRIED FORWARD TO COLLECTION PAGE</b>                                                                                                                                                   |      |     |            |             |

| ITEM NO.  | DESCRIPTION                                                                                                                                                                                                                 | UNIT | QTY | RATE KSHS. | TOTAL KSHS. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|------------|-------------|
| 5.30      | 50 x 32mm diameter reducer                                                                                                                                                                                                  | NO   | 2   |            |             |
| 5.31      | 15mm diameter Automatic air vent as "SPIRAX SARCO Model AE50S" or equal and approved                                                                                                                                        | NO   | 3   |            |             |
| 5.32      | 50mm expansion bellows as " SPIRAX SARCO" Model AR 16 rated at 16bar at 300°C or equal and approved.                                                                                                                        | NO   | 2   |            |             |
| 5.33      | 32mm Ditto                                                                                                                                                                                                                  | NO   | 2   |            |             |
| 5.34      | C-shaped Bourdon pressure gauge as "GENERAL Model BSPG (dry case" to EN-87 with a range of 0 to 16 kg/cm <sup>2</sup> (Bar) with a dial diameter of 100mm or equal and approved.                                            | NO   | 2   |            |             |
| 5.35      | <b>BALANCING VALVES</b>                                                                                                                                                                                                     |      |     |            |             |
| 5.36      | 50mm diameter balancing valve as " SANT Industrial controls" model SI-1021/P or equal                                                                                                                                       | NO   | 1   |            |             |
| 5.37      | 40mm diameter balancing valve as " SANT Industrial controls" model SI-1021/P or equal                                                                                                                                       | NO   | 1   |            |             |
| 5.38      | 32mm diameter balancing valve as " SANT Industrial controls" model SI-1021/P or equal                                                                                                                                       | NO   | 1   |            |             |
| 6.00      | <b><u>OIL PIPEWORK</u></b><br>Supply, deliver and install black mild steel tubing to BS EN 10255:2004 with tapered pipe thread to EN 10226-1, medium duty (class B). Pipe fittings shall be malleable cast iron to EN 10242 |      |     |            |             |
| 6.01      | 50mm diameter black mild steel pipework to BS EN10255:2004                                                                                                                                                                  | LM   | 5   |            |             |
| 6.02      | 32mm Ditto                                                                                                                                                                                                                  | LM   | 5   |            |             |
| 6.03      | 25mm Ditto                                                                                                                                                                                                                  | LM   | 5   |            |             |
| 6.04      | <b><u>OIL PIPE FITTINGS AND VALVES</u></b>                                                                                                                                                                                  |      |     |            |             |
| 6.05      | <b>50mm diameter bend</b>                                                                                                                                                                                                   | NO   | 5   |            |             |
| 6.06      | 32mm Ditto                                                                                                                                                                                                                  | NO   | 5   |            |             |
| 6.07      | 25mm Ditto                                                                                                                                                                                                                  | NO   | 5   |            |             |
| 6.08      | <b>50mm diameter equal tee</b>                                                                                                                                                                                              | NO   | 5   |            |             |
| 6.09      | <b>32mm Ditto</b>                                                                                                                                                                                                           | NO   | 5   |            |             |
| 6.09      | 25mm Ditto                                                                                                                                                                                                                  | NO   | 1   |            |             |
| 6.10      | <b>50 x 32mm diameter reducer</b>                                                                                                                                                                                           | NO   | 1   |            |             |
| 6.11      | 50mm diameter cross                                                                                                                                                                                                         | NO   | 1   |            |             |
| 6.12      | 50mm diameter union                                                                                                                                                                                                         | NO   | 4   |            |             |
| 6.13      | 40mm Ditto                                                                                                                                                                                                                  | NO   | 2   |            |             |
| 6.14      | 32mm Ditto                                                                                                                                                                                                                  | NO   | 2   |            |             |
| 6.15      | 25mm Ditto                                                                                                                                                                                                                  | NO   | 2   |            |             |
| 6.16      | <b>50mm diameter cap</b>                                                                                                                                                                                                    | NO   | 1   |            |             |
| 6.17      | <b>25mm diameter plug</b>                                                                                                                                                                                                   | NO   | 1   |            |             |
| 6.18      | 50mm diameter cast iron flanged gate valve as "CRANE " Model FM82 to BSEN 1171:2002, PN 16 or equal and approved.                                                                                                           | NO   | 6   |            |             |
| 6.19      | 40mm Ditto                                                                                                                                                                                                                  | NO   | 2   |            |             |
| 6.20      | 32mm Ditto                                                                                                                                                                                                                  | NO   | 2   |            |             |
| 6.21      | 25mm Ditto                                                                                                                                                                                                                  | NO   | 2   |            |             |
| 6.22      | 50mm diameter flanged cast iron swing check valve as "CRANE" Model FM469 to BSEN12334-2001,PN16 or equal and approved.                                                                                                      | NO   | 1   |            |             |
| 6.23      | Pipe support brackets for supporting pipes in trenches                                                                                                                                                                      | NO   | 20  |            |             |
| <b>M6</b> | <b>TOTAL CARRIED FORWARD TO COLLECTION PAGE</b>                                                                                                                                                                             |      |     |            |             |

| ITEM NO.  | DESCRIPTION                                                                                                                                                                                                                                       | UNIT   | QTY | RATE KSHS. | TOTAL KSHS. |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|------------|-------------|
| 6.24      | 15mm diameter Automatic air vent as "SPIRAX SARCO Model AE50S" or equal and approved                                                                                                                                                              | NO     | 4   |            |             |
| 6.25      | 25mm strainer on boiler water feed line                                                                                                                                                                                                           | NO     | 2   |            |             |
| 6.26      | 50mm strainer for oil line                                                                                                                                                                                                                        | NO     | 2   |            |             |
| 6.27      | Insulation for 25mm diameter pipe for heated oil line                                                                                                                                                                                             | NO     | 40  |            |             |
| 6.28      | Oil interceptor<br>Sleeves only                                                                                                                                                                                                                   | NO     | 3   |            |             |
| 6.29      | Diesel (AGO) for testing the boiler                                                                                                                                                                                                               | Liters | 1   |            |             |
| 6.30      | Electrical works which will involve wiring from local isolators (Provided by others) to the equipment and any other wiring involving the equipment and its controls.                                                                              | Item   | 1   |            |             |
| 7.00      | <b><u>BLOW-DOWN PIT</u></b>                                                                                                                                                                                                                       |        |     |            |             |
| 7.01      | Construct a masonry boiler blow - down pit with suitable cover of size 1.5 x 1.0 x 1.0 m deep and capable of holding discharge water and steam from boilers long enough to cool down before being allowed into the drain system. sleeves & baffle | Item   | 0   |            |             |
| 7.01a     | <b><u>Allow for commissioning of pit</u></b>                                                                                                                                                                                                      | Item   | 1   |            |             |
| 7.02      | <b><u>BOILER INSPECTION</u></b>                                                                                                                                                                                                                   |        |     |            |             |
| 7.03      | Allow for pre and post inspection of the boiler at both testing and normal working pressures and temperatures by an authorised boiler inspector.                                                                                                  | Item   | 1   |            |             |
| 7.04      | Allow for labelling of all the equipment and fittings in the boiler and incinerator rooms.                                                                                                                                                        | Item   | 1   |            |             |
| 7.05      | Allow for painting the pipework in the boiler and incinerator rooms.                                                                                                                                                                              | Item   | 1   |            |             |
| 7.06      | <b><u>PORTABLE FIRE EXTINGUISHERS</u></b>                                                                                                                                                                                                         |        |     |            |             |
| 7.07      | 4.5kg dry CO2 gas portable fire extinguishers complete with squeeze grip operating head, and discharge nozzle, fully charged.                                                                                                                     | No     | 2   |            |             |
| 7.08      | 9litres chemical powder fire extinguisher complete with squeeze grip operating head, and discharge nozzle, fully charged.                                                                                                                         | No     | 2   |            |             |
| 7.09      | 125mm manual alarm bell                                                                                                                                                                                                                           | No     | 2   |            |             |
| 7.10      | Fire instruction notice/sign for the incinerator house as indicated in the particular specifications                                                                                                                                              | Item   | 2   |            |             |
| 7.11      | <b><u>TESTING AND COMMISSIONING</u></b>                                                                                                                                                                                                           |        |     |            |             |
| 7.12      | Allow for setting to work, testing and commissioning of the whole installation works to the satisfaction of the Project Engineer.                                                                                                                 | Item   | 1   |            |             |
| <b>M7</b> | <b>TOTAL CARRIED FORWARD TO COLLECTION PAGE</b>                                                                                                                                                                                                   |        |     |            |             |

## A1.BOILER ,STEAM & HOT WATER

| ITEM NO.  | DESCRIPTION                                                                                                        | UNIT | QTY | RATE KSHS. | TOTAL KSHS. |
|-----------|--------------------------------------------------------------------------------------------------------------------|------|-----|------------|-------------|
| 9.00      | <b>COLD WATER PIPING &amp; FITTINGS</b>                                                                            |      |     |            |             |
| 9.10      | PIPING:                                                                                                            |      |     |            |             |
|           | Supply , install and commission CAGTHERM PPRC Piping to PN 20;<br>DIN 8077-78 PPRC 3 TM 95 complete with fittings: |      |     |            |             |
|           | <b>Piping:</b>                                                                                                     |      |     |            |             |
| 9.11      | 40 mmØ pipe.                                                                                                       | LM   | 60  |            |             |
|           | 40 mmØ pipe.                                                                                                       | LM   | 60  |            |             |
|           | 40 mmØ pipe.                                                                                                       | LM   | 60  |            |             |
| 9.12      | <b>Fittings:</b>                                                                                                   |      |     |            |             |
| 9.13      | <b>90°Bends</b>                                                                                                    |      |     |            |             |
| 9.14      | 40 mmØ Bend                                                                                                        | No.  | 10  |            |             |
| 9.15      | 40 mmØ Bend                                                                                                        | No.  | 10  |            |             |
| 9.16      | 40 mmØ Bend                                                                                                        | No.  | 10  |            |             |
| 9.17      | <b>Tees:</b>                                                                                                       |      |     |            |             |
| 9.18      | 40 x 40 mmØ PPRC tees                                                                                              | No.  | 6   |            |             |
| 9.19      | 40 x 40 mmØ PPRC tees                                                                                              | No.  | 6   |            |             |
| 9.20      | 40 x 40 mmØ PPRC tees                                                                                              | No.  | 6   |            |             |
| 9.21      | <b>Sockets:</b>                                                                                                    |      |     |            |             |
| 9.22      | 40 mmØ PPRC Sockets                                                                                                | No.  | 0   |            |             |
| 9.23      | 40 mmØ PPRC Sockets                                                                                                | No.  | 0   |            |             |
| 9.24      | 40 mmØ PPRC Sockets                                                                                                | No.  | 0   |            |             |
| 9.25      | <b>Reducers:</b>                                                                                                   |      |     |            |             |
| 9.26      | 40 x 25 mmØ Ditto                                                                                                  | No.  | 0   |            |             |
| 9.27      | 40 x 25 mmØ Ditto                                                                                                  | No.  | 0   |            |             |
| 9.28      | <b>Stop Valves:</b>                                                                                                |      |     |            |             |
| 9.29      | 40 mmØ Ditto                                                                                                       | No.  | 0   |            |             |
| 9.30      | 32 mmØ Ditto                                                                                                       | No.  | 0   |            |             |
| <b>M9</b> | <b>TOTAL CARRIED FORWARD TO COLLECTION PAGE</b>                                                                    |      |     |            |             |

| ITEM NO. | DESCRIPTION                                 | UNIT | QTY | RATE KSHS. | TOTAL KSHS. |
|----------|---------------------------------------------|------|-----|------------|-------------|
|          | <b>COLLECTION PAGE</b>                      |      |     |            |             |
| M4       | TOTALS FOR EXTRA PIPEWORK                   |      |     |            |             |
| M5       | TOTALS FOR HOT WATER PIPEWORK INSULATION    |      |     |            |             |
| M6       | TOTALS FOR OILPIPEWORK                      |      |     |            |             |
| M7       | TOTALS FOR BLOW DOWN PIT                    |      |     |            |             |
| M8       | TOTALS FOR INSTALLATION ONLY                |      |     |            |             |
| M9       | TOTALS FOR COLD WATER SUPPLY & INSTALLATION |      |     |            |             |
| A1       | <b>TOTAL CARRIED TO SUMMARY PAGE</b>        |      |     |            |             |

**THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED RESEARCH, TECHNOLOGY AND INNOVATION LABORATORIES AND RELATED INFRASTRUCTURE ON PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B', NAIROBI**

**BILL OF QUANTITIES FOR INCINERATOR INSTALLATION**

| ITEM NO.  | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | UNIT   | QTY  | RATE KSHS. | TOTAL KSHS. |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|------------|-------------|
|           | <b>INCINERATOR - (Incinerator is on site)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |      |            |             |
| 1.0       | Supply, deliver, install and test 75kg/hr leather waste incinerator as a complete packaged unit. The incinerator to be complete with 2 No. Burners (ignition and after burners) capable of burning 75kg of mixed leather industry waste per hour, FD fan, air receiver, air ductwork unit with its dampers, pressure and temperature gauges, sight glass with fibre glass gaskets and control panel (fully) wired. The incinerator should have two chambers (hearth and after chamber) with upper chamber capable of burning flue waste from lower chamber and eliminating hazardous emissions completely and to comply with Kenya subsidiary legislation, 2006, third schedule (regulations 19,35) details of which are given in this specification. | Item   | 0    |            |             |
| 1.0a      | <b>Allow for commissioning of the incinerator already installed</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Item   | 1    |            |             |
| 1.0b      | Allow for emission abatement plant to be connected to the incinerator. The plant to consist of waste heat recovery unit, a cyclone for enhanced particulate removal, reagent injector, abatement system and exhaust fan as "TODAYSURE MATTHEWS" or equal and approved. wet Scrubber, chemical dosing system and coil type heat recovery system supplied in lieu of item 1.0a                                                                                                                                                                                                                                                                                                                                                                          | Item   | 0    |            |             |
| 1.0c      | <b>Allow for commissioning of the emission abatement system already installed</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Item   | 1    |            |             |
| 1.0d      | <b>Allow for maintenance of the Incinerator for 1 year after commissioning</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Item   | 1    |            |             |
| 1.01      | Self supporting chimney (flue) to be mounted on the incinerator of a length of 80m and a diameter corresponding to the diameter of the incinerator's waste gases outlet but approximately 600mm. The whole chimney to be insulated and it will be mounted on a concrete base constructed by others but as per sub-contractor's instructions.                                                                                                                                                                                                                                                                                                                                                                                                          | Item   | 0    |            |             |
| 1.01a     | <b>Supply and install an induction smoke fan as "System air " model DVG-H400D4 rated at 2800m³/h at 250pa and 370°C.or equal and approved</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No.    | 1    |            |             |
| 1.01b     | <b>Allow for commissioning of the chimney system already installed</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Item   | 1    |            |             |
| 1.02      | Daily service fuel oil tank, capacity 1800 litres, size 1220 x 1220 x 1220mm high mounted on a 2.5m high tower. The tank to be complete with access manhole, washout, overflow pipe, access ladder, outlet connections and gate valves.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Item   | 0    |            |             |
| 1.02b     | <b>Allow for connection of the day fuel tank to the incinerator and commissioning of the same.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Item   | 1    |            |             |
| 1.03      | 2.5m high steel tower to support the daily service fuel oil tank and steel ladder, all to be approved. Baseframe supplied in lieu of tower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Item   | 0    |            |             |
| 1.04      | 50mm diameter class 'C' black mild steel pipe to BS EN 10255:2004 . to connect the bulk fuel oil storage tank and the day fuel oil service tank                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Lm     | 30   |            |             |
| 1.05      | Initial filling of the day oil storage tank with Automotive gas oil (Diesel) for fire testing and commissioning of the burners.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Litres | 1000 |            |             |
| 1.06      | Semi-rotary hand transfer pump capable of transferring oil from drums to day oil service tank.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No.    | 0    |            |             |
|           | <b>PIPE WORK</b><br>Supply, deliver and install black mild steel tubing to BS EN 10255:2004 with tapered pipe thread to EN 10226-1, medium duty (class B). Pipe fittings shall be malleable cast iron to EN 10242                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |      |            |             |
| 6.01      | 50mm diameter black mild steel pipework to BS EN10255:2004                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | LM     | 10   |            |             |
| 6.03      | 25mm Ditto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | LM     | 10   |            |             |
| 1.09      | 50mm diameter gate valves with associated unions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | No     | 2    |            |             |
| 1.1       | 50mm diameter strainer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | No.    | 1    |            |             |
| 1.11      | 50mm diameter non-return valve                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No.    | 1    |            |             |
| 1.12      | 50mm diameter bends                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No.    | 4    |            |             |
| <b>A2</b> | <b>TOTAL CARRIED FORWARD TO SUMMARY PAGE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |      |            |             |

**THE PROPOSED PHASE 2 WORKS FOR THE PROPOSED RESEARCH, TECHNOLOGY AND INNOVATION LABORATORIES AND RELATED INFRASTRUCTURE ON PLOT L.R. NO. 209/5811, DUNGA ROAD, SOUTH 'B', NAIROBI**

| SUMMARY OF BILL OF QUANTITIES          |                                    |      |               |
|----------------------------------------|------------------------------------|------|---------------|
| ITEM No.                               | DESCRIPTION                        | UNIT | AMOUNT (Kshs) |
| A0                                     | PRELIMINARIES & GENERAL CONDITIONS | ITEM |               |
| A1                                     | BOILER ,STEAM AND HOT WATER SYSTEM | ITEM |               |
| A2                                     | INCINERATOR                        | ITEM |               |
| SUBTOTAL                               |                                    |      | -             |
| ADD CONTINGENCY COSTS 10%              |                                    | 10%  | -             |
| <b>TOTAL CARRIED TO FORM OF TENDER</b> |                                    |      | -             |
| Total in words: .....                  |                                    |      |               |
| Name of Contractor: .....              |                                    |      |               |
| Address: .....                         |                                    |      |               |
| Telephone:.....                        |                                    |      |               |
| Pin No. ....Vat Reg. No.....           |                                    |      |               |
| Signature: .....                       |                                    |      |               |
| Official Stamp/Date: .....             |                                    |      |               |