SPECIFICATION AND TENDER DETAILS

FOR

BOILER AND DOMESTIC HOT WATER PLANT REPLACEMENT

At

Rosecroft
3 Finsbury Road
Wood Green
London
N22 8QF

For

Christian Action (Enfield) Housing Association Ltd
Benedict House
61 Island Centre Way
Enfield
EN3 6GS

By

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1.0 INTRODUCTION

1.1 Rosecroft is a residential retirement home comprising 32 dwellings on three floors with a scheme managers flat and tank room at roof level. The boiler plant provides space heating and domestic hot water throughout the building and is located in a room at ground level in a single storey structure at the side of the main building with separate access from the entry road

This contract relates to the removal of the existing boiler plant and associated connections, and the installation of new Mechanical Systems comprising new gas fired condensing boilers and flue ductwork with vented domestic hot water calorifiers and associated equipment together with pipework connection to the existing space heating and DHWC circuits with all necessary electrical supplies, controls, testing, and commissioning all as later specified and described in the schedules of works and shown on the tender drawings.

The work is to be carried out whilst the building is occupied and the contractor is recommended to visit to inspect the site and plant room spatial arrangement. For an appointment telephone the scheme manager tel : 0208 889 0204 or 07852 718620

1.2 STANDARDS AND WORKMANSHIP

BUILDING WORKS

All workmanship and materials are to conform to relevant British Standards and Codes of Practice, in particular BS8000 – Workmanship on Building Sites.

All hard and soft landscaping disturbed by the works are to be properly reinstated.

MECHANICAL WORKS

All workmanship and materials shall conform to relevant British Standards, Codes of Practice, Regulations and all relevant HVCA standards for installation work

ELECTRICAL WORKS

All workmanship and materials shall conform to relevant British Standards, Codes of Practice, Regulations and BS7671 in particular

GENERAL

Should any work fail to be of the required quality and standard as determined solely by the Contract Administrators, the contractor is to remedy the defective workmanship and/or materials without delay and at no additional cost to the contract.

All work is to be in accordance with the requirements of the local authority.

The contractor is responsible for ensuring all formal notices are given to the relevant authorities and inspections consents and approvals are obtained to the work, including meeting all costs and fees so involved.

All scaffolding, protection, hoisting of materials, together with builders work in connection is to be provided under this contract.

1.3 DEFINITIONS

1.0 MAIN CONTRACT - Main Contract to be arranged between the Employer and the Main Contractor.

2.0 MAIN CONTRACTOR - Company, firm or person appointed to execute the Main Contract.

3.0 SUB-CONTRACT - Sub-Contract to be arranged between the Main Contractor and Sub-Contractor.

4.0 SUB-CONTRACTOR - The company, firm or person appointed to execute the Sub-Contract.

5.0 INSTALLER - The Sub-Contractor, or where a named installer not in the Sub Contract, the company, firm or person appointed to execute that installation.

6.0 BUILDING CONTRACTOR or CONTRACTOR - Company, firm or person appointed by the employer to execute building works and co-ordination duties when specified.

7.0 SERVICES CONTRACTOR or M&E CONTRACTOR - Company)s), firm(s) or person(s) appointed by the employer as applicable to execute installations including but not limited to heating, ventilation pipework, air conditioning, electrical lighting and power, communications installations which may be carried out under one or more contracts

8.0 TENDERER - Any company, firm or person invited to submit a Tender for the works.

8.1 TENDER-BONA FIDE - Competitive tender to provide perform execute and do all works and things necessary to complete the works in accordance with the Specification and drawing for a fixed or variable price as later specified.

9.0 WORKS - plant and materials to be provided and all work to be performed to complete the contract or Sub-Contract.

10.0 CLERK OF WORKS - The person or persons appointed by the Employer to act as his Inspectors.

11.0 SITE - The land and/or buildings in which the works are to be executed including every building of a premises, yards, passageways, and any means of access or egress from the site.

12.0 PROVIDE - obtain, deliver, fix into position, make all connections, test and commission - unless any part of this is specifically excluded from the contract or sub-contract works.

13.0 SPECIFIED - As specified elsewhere in any contract or sub-contract document including where indicated on drawings.

14.0 APPROVED/FOR APPROVAL - submit for written approval and, if not approved, submit such 'alternative as will obtain approval - which will not unreasonably be withheld.

15.0 SUITABLE/AGREED - to be selected from details and/or samples submitted for approval.

16.0 APPROVAL IN PRINCIPLE - schematic drawings, control panel details, working installation and builders work drawings prepared by the contractor to enable the contract to be carried out will be approved in principle as to the general requirements of the works and not in detail. The contractor shall remain responsible for all matters of detail and design required.

17.0 DIRECTED/AUTHORISED - a written instruction by the Contract Administrator or verbal which shall be acted upon pending written instruction.

18.0 CONSULTING ENGINEER OR ENGINEER. - Reference to the Consulting Engineer or Engineer will mean acting in the capacity of authorised representative of the Employer and/or Architect.

19.0 CONTRACT ADMINISTRATOR - The Client or Consulting Engineer where so named in the Form of Contract.

20.0 DOMESTIC SUB CONTRACTS - Where mechanical and electrical works are to be carried by mechanical and electrical contractors under direct appointment to a Company, Firm or person appointed by the Employer to execute the Contract.

21.0 CDM - The Construction (Design & Management) Regulations and any amendments.

22.0 PRINCIPAL CONTRACTOR - Shall mean the Company, firm or person appointed as the Principal Contractors for the Project as defined by CDM.

23.0 CDM ADMINISTRATOR - Shall mean any person for the time being appointed under CDM Regulations.

24.0 CDM DEFINITIONS - The definitions contained within the CDM shall apply specifically to those regulations and shall not be considered to apply in interpretation in this specification/Schedules of Works etc. except where clauses refer specifically to CDM.

2.0 CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS CDM 2015

MANAGEMENT OF HEALTH AND SAFETY AT WORKS AND CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS

2.1 ASSESSMENT OF WORK PEOPLE AND PERIOD ON SITE

We have assessed that the number of people working on site on the project will not exceed 4 persons per day and that the time for completing the works will not exceed 30 working days.

The tenderer shall indicate on the questionnaire in Part 5.0 if he believes either of these assumptions are incorrect.

On the basis of the above assumptions the CDM duties of Clients, CDM Co-ordinator and Principal Contractor do not exist.

The works are of a nature that require special precautions and the contractor shall provide such under the Health and Safety at Work Act 1974 and the Management of Health and Safety and Welfare Regulations for both his own work persons and also for personnel engaged under sub-contract for the installation

The Contractor will produce Health and Safety risk assessments together with working method statements for agreement with the Client before commencing the work.

The Contractor will be responsible for ensuring safe working on site, however, in the event that the Consulting Engineer/Contract Administrator shall consider that additional requirements are necessary the Contractor shall immediately comply unless he can demonstrate that such instruction cannot be reasonable complied with or proposes and acceptable alternative without delay.

2.2 INFORMATION TO BE PROVIDED AT COMPLETION FOR THE BUILDING MANUAL

The Tender shall include for the supply in duplicate of the following printed record information, together with an electronic digital media copy.

- As installed drawings for building and mechanical and electrical installations
- Building and operation/maintenance manual
- Description of the works
- Equipment Schedule/manufacturers
- Planned maintenance schedule
- Test certificates
- Manufacturers literature

2.3 PRE CONSTRUCTION INFORMATION

The pre-construction information provides information for those bidding for or planning work and for the development of the construction phase plan.

2.3.1 DESCRIPTION OF PROJECT

(a) The general extent of the works is given in the introduction Part 1.0 item 1.1 and described in detail in the following schedules of works.

The building will be occupied throughout the works and the residents are to be protected from the work to be carried out together with offloading, storage, and handling of material transfer to the work space.

The heating and domestic hot water services are to be maintained with temporary arrangements with shut down periods of minimum duration at times prearranged with the scheme manager.

2.3.2 CLIENTS CONSIDERATIONS AND MANAGEMENT REQUIREMENTS

(a) Communication and liaison between Client and others.

Communication in respect of project design contract matters, variations etc. will be directed to the Consultant who will address the issues with the Client.

For matters of day-to-day arrangements for the work on site the Contractor shall appoint a site representative to liaise and agree such matters with the Scheme Manager.

(b) Security
The contractor shall demonstrate that all personnel carrying out work at the premises have received full clearance from the Disclosure and Barring Service (DBS).
The Contractor shall be responsible for security of the designated work areas and shall agree a programme for opening and closing the areas with the Scheme Manager.

(c) Welfare
The contractor shall arrange suitable facilities for work persons to change clothing and eat meals.
The Client will designate communal toilet facilities for use by the Contractor.
The Contractor will be responsible for maintaining the facilities in a clean condition to the satisfaction of the scheme manager and provide all sanitary consumable products.
First Aid kit shall be provided and a First Aider nominated.

(d) Loading/Offloading
The contractor shall be responsible for all off loading and loading of his goods, plant and materials and make prior arrangement with the Scheme Manager, concerning delivery dates and times to ensure that deliveries do not conflict with other activities.

(e) Fire Precautions
The Contractor will provide adequate and suitable fire extinguishers at all places of work. All hot working to be subject to agreement of a permit to work system. Emergency procedures and means of escape will be identified by the Scheme Manager.

(f) Smoking
No smoking permitted at site

(g) Parking
Parking of the Contractors vehicle shall be agreed by the Scheme Manager. Take into consideration occupiers to ensure that they are not caused inconvenience

2.3.3 SIGNIFICANT DESIGN AND CONSTRUCTION HAZARDS

(a) Design assumptions, work methods, sequences
The work is typical of installations generally found in the installation of LTHW systems and we

consider that there are no significant additional risks to those normally experienced in the industry.

If the tenderer considers otherwise then this must be stated at the time of tender. The inherent risks that cannot be designed out of the works are given in the following Part 2.4

(b) The Contractor is to allow for suitable guarding and protection during the installation of the boiler plant.

The plant room is also to be guarded against access by unauthorized personnel.

The arrangements are to be agreed at the mobilization stage and a method statement and plan are to be agreed with CAHA and Consultant.

2.3.4 HEALTHAND SAFETY FILE

The Contractor is to prepare a Health and Safety file as described in item 2.2.

2.4 DESIGN STAGE ASSESSMENT OF SIGNIFICANT RISKS ASSOCIATION WITH THE DESIGN OR WORKS

HAZARD/RISK/PRECAUTIONS

This includes but are not limited to the following for which the contractor shall prepare method statements for inspection by the Client before the works commence.

ITEM	HAZARD/OPERATION	RISK RATING	PRECAUTIONS
	Electricity	High	Ensure all circuits on which work is to be carried out are isolated and switches/ switch fuses controlling the circuits are locked in the 'off' position or other means employed to prevent circuits becoming Live Danger men working' and 'Danger Alive' notices to be posted as necessary
	Falls from Heights	High	Use adequate mobile towers/scaffolding, hoists and ladders for all working at above 2m
	Falling Objects	High	Means of preventing access by the residents to designated work areas will be agreed with the Scheme Manager before work commences Observe men working above notices Hard hats to be worn by contractors personnel and authorised visitors into the working area The contractor shall be responsible for ensuring compliance by his personnel
	Liaison with Other Contractors	Medium	Maintain liaison with office personnel, administration builder, subcontractors and other contractors working in the premises on a daily basis to ensure they are aware of the extent of your activities and they of yours In the event of any difficulties report verbally initially and follow up in writing to the Contract Administrator
	External Roof Work Area	High	Ensure all plant, Equipment and materials are kept within safe working area to prevent such falling to below Observe safe working areas identified by the principal contractor
	Lifting & hoisting plant	High	Potential for injury in carrying & hoisting plant & materials to place of installation Protect & guard areas ensure adequate resources & facilities are available such as mechanical lifting devices as appropriate

Draining down LTHW pipework	Low	Operatives to wear protective clothing. Ensure total isolation of pipework and equipment & allow water to cool to below 40°C before draining.
Hot working	High	Remove combustible materials from the work area. Protect building fabric & operatives with protective clothing and ventilate the space. Hot working to be subject to a permit to work system.
Chemical cleaning & corrosion treatment LTHW system	High	To be carried out from spaces with adequate ventilation by operatives wearing protective clothing.
Adhesives	High	Are only to be used for fixing insulation in suitably ventilated spaces
Gas pipework	High	Purge and ventilate pipework to ensure it is gas free before cutting hot working or machining
Pipework pressure tests	High	Potential for rupture ensure all operatives are aware & clear of potential danger areas
Storage	Medium	Pipework to be safety racked & guarded to ensure it does not cause danger to the Residents or Operatives
Insulating materials	Medium	Dust & handling hazard. Protective clothing to be worn by operatives & areas sealed to protect other site areas and other operatives
Materials & equipment deliveries, & area of work	High	Protect and guard to prevent unauthorised access to materials & working areas Safety dispose of redundant plant & Materials
Testing and Commissioning	Medium	Electrician to issue test and completion certificate before circuits are energised and pumps run/boilers fired All operatives to be informed when circuits are made live
General Work Activities	Medium	The mechanical and electrical services installations are typical of those employed in the industry for which the contractor will be aware of the associated risks and for which personnel must be trained to be aware of and deal with
Works which have high/medium risks which cannot be designed to avoid	High/ Medium	Replacement of flues & roof cowls & installation of high level pipework and equipment. The contractor shall prepare method statements for comment by the contract administrator.

3.0 SCHEDULE OF WORKS

This schedule of works to be read together with the Schedule of Tender drawings issued with this specification.

CONTENTS

3.0 MECHANICAL INSTALLATIONS

SCHEDULE OF WORKS

EXTENT OF SERVICES FOR INFORMATION

The works to be carried out under this section shall include the provision of Mechanical Engineering Services listed below and as further described in the relevant Sections of the Specification and the Equipment Schedules.

The list is necessarily brief and is for guidance only, and must not in any way be considered to replace the intent and requirements of this Specification.

The building will be occupied throughout the work and the cold mains, down service, and the domestic hot water service water is to be maintained with minimal interruption by temporary arrangements. This may be achieved by the early installation of the new domestic hot water calorifiers using the electric immersion heaters for domestic hot water generation while the other works progress.

The draining down of the heating and domestic hot water distribution system, and removal of all existing redundant boiler plant, calorifiers, pipework and equipment, including safe isolation and removal of electrical and control wiring.

The safe purging venting disconnection and removal of existing gas pipework to the boilers.

Provision of domestic hot water storage calorifiers, and trace heated distribution pipework, connected to the existing pipework entering the plant room.

The installation of LTHW gas fired condensing boilers, and flue ductwork systems for space heating and domestic hot water generation with gas, heating, and DHWS, distribution pipework connected to the existing pipework entering the plant room.

Provision of automatic controls and wiring for the boiler plant, and domestic hot water systems, together with all electrical power wiring to each item of equipment.

Thermal insulation of LTHW heating, and new domestic hot and cold water service pipework within the plant room.

Provision of a new gas supply to the new boilers, complete with gas safety shut off valves and detectors.

Replacement of thermostatic and lockshield regulating valves to all of the radiators within the dwellings and communal areas.

The chemical cleaning and provision of water treatment to the LTHW system, and disinfection / sterilisation of the domestic water systems, together with regulation and balancing of all water systems.

Provision of record documentation comprising, as installed drawings, and operation and maintenance manuals.

All scaffolding, protection, barriers, hoisting, together with builders work in connection is to be included within the tender.

3.0 MECHANICAL INSTALLATIONS

SCHEDULE OF WORKS

1.0 DOMESTIC HOT WATER SERVICES

1.1 EXTENT OF WORKS

The works to be carried out under this section shall comprise the removal from site of the existing calorifiers and the installation of pre-insulated vented domestic hot water calorifiers, complete with safety valves, pumps, distribution pipework, isolating valves, insulation, electric immersion heater, trace heating, and controls, connected to the existing cold feed, open vents, and distribution pipework.

1.2 PIPEWORK

All DHW distribution pipework and fittings are to be to installed using galvanised mild steel tube to BS 1387 heavy quality with BSPT screwed joints using malleable galvanised iron fittings with anti-electrolytic couplings between dissimilar materials and provision for expansion and suitably anchored and fixed.

Extend pipework and connect to existing DHW system as indicated on the drawings.

Primary LTHW connections to the calorifiers is to be black mild steel tube to BS 1387, heavy weight quality, with BSPT screwed joints using malleable iron fittings

Extend pipework from the low loss header and connect as indicated on the drawings.

All pipes passing through the structure are to be provided with sleeves of suitable size and the same material to allow movement.

1.3 DOMESTIC HOT WATER CALORIFIERS

Provide two vertical steel vitreous enamel lined indirect vented domestic hot water calorifiers located on a level concrete base, complete with manufacturers pre insulated jacket, clean out door, sacrificial anode, controls, safety valves, cold feed, non-return and regulating valves, de stratification circulating pumps and a 4.5kW standby immersion heater and fittings.

The calorifiers are to be provided with a drain cock, sensor pockets, and have a heat transfer surface sufficient to raise the secondary contents from 10^{o}C to 65^{o}C, in not more than 30 minuets, when provided with LTHW at 82^{o}C flow, and 71^{o}C return.

The shell is to be suitable for a maximum secondary working pressure of 6.0 bar, and the primary coil is to have a working pressure of 3.0 bar, and be as supplied by Hamworthy Ltd their Powerstock range model PS500 as the capacity indicated on the equipment schedule.

1.4 PRIMARY CIRCULATING PUMP

Provide a duplicate invertor controlled pump and pipework complete with non-return and isolating valves. The pump is to be suitable for low temperature hot water circulation, and be as manufactured by Grundfos Ltd, their glandless circulator type as scheduled, suitable for a 230v SPN 50Hz electrical supply.

1.5 SECONDARY DESTRATIFICATION CIRCULATING PUMPS

Provide recirculating pumps and pipework complete with non-return and isolating valves.
The pumps are to be suitable for secondary hot water circulation, and be as manufactured by Grundfos Ltd, of bronze construction glandless circulator type as scheduled, suitable for a 230v SPN 50Hz electrical supply.

1.6 TRACE HEATING

Provide trace heating to the DHW flow pipework within the boiler room as manufactured by Raychem Ltd of the self regulating type to maintain 55^{o}C with thermostatic control.
Trace heated pipework is to be identified with continuous warning tape indicating that a 230v cable is installed under the insulation.

1.7 PRIMARY PIPEWORK

Connect the domestic hot water calorifier, to the constant temperature boiler header, and provide control and safety valves and automatic controls, as later specified.

1.8 DISINFECTION

Carry out disinfection as described in BS 6700, and obtain samples of water and provide certificates, together with a written analysis of the water systems disinfection.

1.9 EXISTING PIPEWORK

Remove the existing redundant calorifiers and pipework and dispose of to a registered site

1.10 SERVICE DISRUPTION

The disruption of supply to the residents is to be minimised by the early installation of the new calorifiers and immersion heaters which can be connected to the domestic hot water services pipework with electrical connection of the immersion heaters for domestic hot water generation prior to removal of the boiler plant to reduce disruption of the DHWS.

3.0 MECHANICAL INSTALLATIONS

SCHEDULES OF WORKS

2.0 BOILER PLANT

2.1 EXTENT OF WORKS

The work to be carried out under this section shall comprise the removal of the existing boiler plant, pipework, and ancillaries and the installation of three new natural gas fired condensing boilers for the generation of LTHW, to serve the space heating zone, and domestic hot water calorifiers, complete with pressurisation unit, pipework, pumps, valves, supports, insulation, and fittings, together with associated controls, as specified and indicated on the drawings.

In particular the manufacturer's draught conditions, and minimum water flow rates and temperatures are to be met.

2.2 BOILERS

Provide in the position indicated on the drawings three Hamworthy Ltd Purewell Variheat PV70c floor standing gas fired LTHW open flued condensing boilers of outputs as scheduled when operating at 82^{o}C flow and 71^{o}C return with natural gas.

The boilers are to have cast iron primary heat exchangers and aluminium secondary heat exchangers, and be fitted with makers insulated casing, integral fan, low NOx burner, and ignition, flame detection, and temperature controls.

The boilers are to be suitable for operating at 2.0 bar working pressure, and a test pressure of 4.0 bar and suitable for an electrical supply of 230V 50Hz SPN, and the installation is to conform to all relevant British standard Specifications and Codes of Practise, A.O.T.C. Gas and the building regulation requirements.

The boilers are also to be complete with automatic electric ignition, control and high limit lockout thermostats, and pressure relief safety valve, drain cock, condensate drain with pipes to soakaway drain, temperature and altitude gauges.

Provide gas supplies, extended from the existing meter, together with a gas cocks adjacent to the burner as later specified.

Install safety valves and control valves as scheduled or later specified and indicated on the drawings, together with primary connections to the low loss header with connections to the existing space heating circuit, and domestic hot water calorifiers.

2.3 BOILER CIRCULATING PUMPS

Provide recirculating pumps and pipework complete with non-return and isolating valves on the return connection to each boiler.

The pumps are to be suitable for LTHW water circulation, and be as manufactured by Grundfos Ltd, glandless circulator type of duty as scheduled, suitable for a 230v SPN 50Hz electrical supply.

2.4 PRIMARY HEATING CIRCULATING PUMPS

Provide duplicate invertor controlled pumps and pipework complete with non-return and isolating valves to the compensated space heating zone.

The pumps are to be suitable for low temperature hot water circulation, and be as manufactured by Grundfos Ltd, their glandless circulator type as scheduled, suitable for a 230v SPN 50Hz electrical supply.

2.5 PRESSURISATION UNIT

Provide in the position indicated on the drawings a LTHW pressurisation set as manufactured by Hamworthy Ltd, their Chesil unit complete with expansion vessel, feed tank, non-return valves, high and low pressure switches, high/low pressure alarm, contactors/starters and control panel.

All to be mounted on a common bedplate, and suitable for a 230v/50Hz/SPN electrical supply.

The unit is to be connected to the system through an anti-gravity loop, with automatic air vent, lock shield valve, and quick fill cold water connection pipework with lockshield, and double check valves as indicated on the drawings.

2.6 PIPEWORK

LTHW pipework within the boiler plant room is to be installed using black mild steel tube to BS 1387, heavy weight quality, with BSPT screwed joints using malleable iron fittings.

Condensate pipework is to be installed using ABS solvent welded pipework and fittings to BS 5255 arranged to discharge to a soakaway as indicated on the drawings.

All pipes passing through the structure are to be provided with sleeves of suitable size and the same material to allow movement.

2.7 VALVES

Valves for isolation and or regulation are to be provided at all main branches, and at all items of equipment as specified, and or indicated on the drawings.

Double regulating valves to be bronze Fig. No. CV1432 as manufactured by Hattersley Ltd.

2.8 STRAINERS

Provide a full bore low resistance pipeline strainers as Hattersley Ltd fig. 807 or equal and approved in the common primary return for the heating and HWC with valves for isolation on inlet and outlet side.

2.9 AIR VENTS

Provide automatic air vents type D2001 AAV as Crane Ltd manufacture at all high points.

2.10 AIR SEPERATOR

Provide Flamco Ltd Flexair 80mm air separators in the main flow on the suction side of the pumps.

2.11 FLUE GAS SYSTEM

Provide an insulated ducted system for flue gas discharge of stainless steel complete with terminal and condense drains as indicated on the drawings.

The brick chimney is to be provided with a flexible 316 stainless steel seam welded twin wall insulated liner to EN 1856-2 complete with all fittings and accessories.

The flue discharge terminals are to be complete with weathering collars, and are to be installed to the requirements of BS 5540 and BS 6644 as recommended by the boiler manufacturers.

2.12 GAS SUPPLY

Provide gas cocks for isolation at the boilers, together with gas distribution pipework connection to the burner, in black mild steel tube to BS 1387.

2.13 REPLACEMENT OF BUILDING RADIATOR VALVES

The LTHW system is to be drained and flushed as clause 2.14 following which all of the existing thermostatic and lockshield regulating valves are to be replaced to all radiators within the dwellings and communal areas.

A total of 150 radiators are to be allowed with the final cost adjusted pro rata to the actual number of radiators installed.

The valves are to be either straight or angle pattern to suit the pipework configureation and be as manufactured by Honeywell or approved equal.

2.14 LTHW HEATING SYSTEM CLEANING AND WATER TREATMENT

All of the existing space heating distribution system and new boiler house pipework is to be filled with clean water, and then drained and flushed through until clear of all traces of suspended matter, then clean pockets, boiler waterways, and all low points.

Following installation of the radiator valves as clause 2.13 the system is then to be filled with clean water, vented of air, and Pyratox 50 introduced through a dosing pot connection on the suction side of the pumps, to bring the pH value to 7.0 as the manufacturer’s recommendations.

Chemicals are to be as supplied by Aldous & Stamp Ltd, 88 Avenue Road, Beckenham, Kent BR3 4SA.

3.0 ELECTRICAL POWER SUPPLIES AND AUTOMATIC CONTROLS

3.1 EXTENT

The work to be carried out under this section shall comprise the installation of all Electrical Power Wiring and Automatic Controls for the Mechanical Services and the general extent of the system is set out below all to be carried out by a Trend Ltd accredited controls specialist who are to provide the design installation and commissioning of the power wiring and control system as specified.

The plant is to be controlled by a Trend Ltd IQ-View system mounted within a purpose built control panel as later specified to enable separate control of the variable temperature compensated space heating zone, with optimised time scheduled control, and prioritised generation of domestic hot water

3.2 BOILERS

The boilers are to be provided with the manufacturer's microprocessor control system for ignition, flame detection, and flow temperature to maintain the required flow temperature at 82^{o}C with high limit cut out.

The boiler firing circuits are to be interlocked with high and low pressure switches on the pressurisation unit, and the pumps are to run on via a timer on plant shut down.

The boilers are to be under time schedule control from a programmer/optimiser with compensator control of the space heating, and priority control of domestic hot water, with a minimum of two 'on' and 'off' periods each day, seven days/week for the separate control of heating and domestic hot water.

Provide three port control valves for the variable temperature heating, and constant temperature primary HWC, and two port zone valve for isolation of the space heating.

3.3 HWS CONTROL

Provide dual control and high limit immersion thermostats in the domestic hot water cylinders, to control the three port valves on the primary flow to maintain the pre-set storage temperatures of 60^{o}C, with two 'on' and 'off' periods each day, seven days/week, together with two port spring close valves operated by the high limit thermostat at 70^{o}C for the separate control of the domestic hot water.

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3.4 GAS SAFETY

Should the safety circuit trip the control panel shall shut down and all of the plant be de-energised and generate an audible warning.

3.5 MAIN CONTROL PANELS AND FIELD MOUNTED EQUIPMENT

The schematic controls diagram and pipework drawings are provided to indicate the controls operation and do not show full details of all controls, ancillaries, and components, etc. and shall NOT be read as a wiring diagram.

Provide a wall mounted purpose made control panel suitably corrosion protected, constructed of mild steel sheet with suitable stiffening and edge sections with a rigid full width access door.

The panel is to be finished in epoxy resin of approved BS colour, manufactured by a specialist control systems manufacturer as specified in this section.

The control panel shall include, but not be limited, to the following equipment.

All necessary items shall be included for the complete system.

Mount on the panel front door :

Door interlocked isolator

Three phase digital kWh check meter

Trend Ltd IQ-View system touch panel display

Control circuit live lamp

Duplicate pumps to be provided with No 1/No 2 selector switches with auto change-over and manual /automatic/off rotary switches for each with all safety interlocks maintained.

Single pumps to be provided with selector switches with and manual /automatic/off rotary switches for each with all safety interlocks maintained.

Pump run and trip lamps (red and green)

Boiler selector switches with lead/lag auto change-over and manual /automatic/off rotary switches for each item with all safety interlocks maintained

Pressurisation unit selector switches with manual /automatic/off with all safety interlocks maintained

Boiler run and trip lamps (red and green)

Pressurisation unit run, trip, high, and low pressure lamps (red and green)

Mounted internally:

Control circuit fuse (HRC)

Starters with overload trips, selector switches, HRC fuses for each heating and HWS pump.

Boiler primary circulating pumps are to be controlled by a run on timer on boiler/plant shut down.

HRC fused supply for Boiler, pressurisation unit, and pumps

HRC fused supply for each item

The main system controls are to provide compensated, time scheduled control, and frost protection operation of the heating system and will also provide priority control of the domestic hot water cylinders.

An optimised start for space heating is also to be provided, together with a separate channel for the timed schedule control of the space heating zone valve, for the isolation in summer when HWS only is in operation.

Provide all panel and interconnecting field control wiring using TLC-rated cable to the manufacturer's details.

3.6 FIELD MOUNTED EQUIPMENT
Shall include the following :-

One motorised three port compensated mixing valve and actuator, with temperature sensors for the compensated space heating circuit.

Two motorised three port spring return control diverting valves for the domestic hot water cylinders with actuators.

One motorised two port line bore zone valve for isolation of the space heating.

Differential pressure switches for pumps.

Boiler control and high limit thermostats

Immersion sensor for primary flow temperature.

Internal space temperature sensor for the compensated zone

External temperature sensor for frost, compensation, and optimisation etc.

HWS immersion sensors for control and high limit

Two motorised two port line bore valves for isolation of the HWC primary flow.

Connect to the wiring control centre in the boiler room, and heating system pumps and control valves etc to terminal blocks labelled for interconnection with the boiler programmer.

3.7 GAS SAFETY CONTROLS
Relay to de-energise all plant on initiation of boiler thermal/electro detectors

Electrically operated solenoid shut off valve

Electro thermal link over boilers.

Emergency 'knock off' buttons.

CO_2 detector.

3.8 PANEL/SCHEME DESIGN AND DRAWINGS
The tenderer is to include for the detailed design of all wiring and controls, and is to submit scheme/panel wiring diagrams and details etc, for approval.

3.9 LOCAL ISOLATORS

Local isolators are to be provided for each item of field mounted electrical equipment/plant whether indicated on the drawings or not.

3.10 POWER WIRING

A three phase isolator is to be provided adjacent to the control panel from an adjacent distribution board and shall be wired and connected to the isolator.

The controls specialist shall be responsible for all power wiring and control wiring from the power and control panel to each item of mechanical equipment using single core PVC insulated cables contained within galvanised mild steel conduit to each electrical power and control supply.

3.11 COMMISSIONING

As later specified upon completion of the installation, the power wiring and control system shall be tested and commissioned by the specialist/manufacturer until satisfactory operation has been demonstrated to the Client/Consulting Engineer.

3.12 TESTING

The mechanical contractor shall supply satisfactory electrical test and completion certificates together with the record information described elsewhere.

3.0 MECHANICAL INSTALLATIONS

SCHEDULES OF WORKS

4.0 TESTING AND COMMISSIONING

4.1 EXTENT

On completion, test and commission the plant and equipment in accordance with the relevant British Standards, and CIBSE codes, and demonstrate operation to the Clients representative and the Consulting engineer.

Test, regulate, fully balance and calibrate all controls and adjust as needed to achieve correct operation.

4.2 TEST CERTIFICATES

LTHW

Provide test certificates for water pressure, flow, and temperature measurement at each commissioning valve, and terminal, together with pressure test of domestic water services, and LTHW pipework.

ELECTRICAL

Provide electrical test certificates for all wiring associated with the works

GAS

Provide gas safety certificate for the new installation.

DHW

Provide certificates of disinfection results and written analysis of the water samples.

3.0 MECHANICAL INSTALLATIONS

SCHEDULES OF WORKS

5.0 THERMAL INSULATION

5.1 EXTENT
Provide thermal insulation to pipework and ductwork as required and specified below.

5.2 HEATING PIPEWORK

The LTHW heating pipework is to be insulated using a preformed sectional closed cell foam insulation of thermal conductivity not greater than 0.022W/m^2K and thickness as the pipe diameter with white PVC finish.

5.3 DOMESTIC HOT WATER SERVICE
To be insulated as specified for heating pipework but in addition a continuous tape warning of an unprotected 230v trace heating cable.

5.4 DOMESTIC HOT WATER CALORIFIERS
To be insulated with manufacturers standard insulating jacket and casing.

5.5 BOILERS
To be supplied with manufacturers integral insulation.

5.6 IDENTIFICATION
Identify pipework with colour bands and direction arrows in accordance with BS1710.

3.0 MECHANICAL INSTALLATIONS

SCHEDULE OF WORKS

6.0 GAS SUPPLIES

6.1 EXTENT OF WORKS

The works to be carried out under this section shall comprise the installation of a service from the supply authority's meters to the boilers.

All to be complete with valves, supports, fittings, as specified and indicated on the drawings.

6.2 GAS PIPEWORK

Extend gas pipework from the gas meter valve to each appliance. Pipework is to be suitably corrosion protected, and is to be installed within steel sleeves in ventilated ducts in accordance with The Institution of Gas Engineers recommendations.

Pipework to be installed using black mild steel tube to BS 1387, heavy weight quality, with butt-welded joints.

Pipes are to be run continuously towards the points of connection, with scale and drain pockets of line bore at low points.

All pipes passing through the structure are to be provided with sleeves of suitable size and the same material to ensure that any movement of the structure will not be imposed on the pipework.

6.3 GAS SAFETY VALVE

Provide in the boiler supply a solenoid operated safety shut off fire valve of the automatic closing type as manufactured by Black Automatic Controls Ltd, their Alkon type with DC coil and separate rectifier.

Provide Gents Ltd electro-thermal fusible links above the boilers and a clearly labelled emergency push button with manual re-set at the boiler room entrance together with audible alarm.

The fusible link and emergency push button are to be wired so that in the event of their activation the electrical supply to the boilers and pumps etc will be isolated and the automatic gas valve will close shut and the audible alarm will sound

6.4 VALVES

Each appliance connection to be provided with a lever operated gas valve.

3.0 MECHANICAL INSTALLATIONS

SCHEDULES OF WORKS

7.0 TENDER DRAWINGS

The drawings listed below comprise the full set of Tender Drawings:

A4 size drawings (issued with this document) :

RC-SK/1	Schematic Boiler Plant Layout
RC-SK/2	Boiler Plant and Equipment Schedule
RC-SK/3	Boiler Flues Condensate and Gas Pipework
RC-SK/4	Boiler Plant Control Schematic

PART 4.0 TENDER SUBMISSIONS

4.1 Tenders are to be submitted by entering prices against the items shown on the following Form of Tender and completing the CDM Questionnaire.

The above documents are to be returned to Christian Action Housing Association with one copy of the specification tender details and drawings in a plain envelope marked "TENDER RETURN" with no other form of identification visible to:

Head of Asset Management
Christian Action (Enfield) Housing Association Ltd
Benedict House
61 Island Centre Way
Enfield
EN3 6GS

Tenders to be submitted no later than 12 Noon on Friday (DATE TO BE CONFIRMED) Tenders not submitted in accordance with the above instructions may not be considered.

4.2 CONDITIONS OF CONTRACT

The Contract will be based on the JCT Agreement for Minor Building Works 2016 with current revisions.

Main entries as follows.

Damages for non-completion £500/week
Defects Liability Period will be 12 months
Payment Period for all certificates will be 28 days
Retention Fund will be 5% of the Contract Sum held until practical completion reducing to $2^1/_2$% for 12 months
Insurances – not less than £5,000.000

Indemnity to Principals clause to be included

Provisional date for commencement – To be agreed
Provisional date for completion – Six weeks from date of commencement

The Contractor is to visit the site and verify for himself all site dimensions, means of access, location of skips, the condition of the property and any other such relevant matters, which may affect him. No claims whatsoever will be allowed which result from the Contractor failing to acquaint himself fully with all site conditions and the existing structure.

A tender in the form of a fixed lump sum price is required to include all that is necessary to execute the specified works and all items which may reasonably be expected to be included to produce a finished job, whether individually specified or not.

The contractor is to maintain a clear and tidy site through the works and is to adequately protect all areas not directly affected by the works and remedy such areas if damaged by the contractor.

In addition the submission of a tender will imply that:-

1 The works described or referred to on the drawings and/or in the specification are all in accordance with the conditions of tender and contract.

2 There has been no disclosure of the amount of the tender figure to any third party and that the tenderer has no knowledge of the tender price of any other company submitting a tender.

3 That no part of the works will be sub-let other than as specified and/or now declared in 4.5 of this Part unless written approval to do so is issued.

I/We hold a valid certificate as required by the "Construction Industry Tax Deduction Scheme"

Signed by…….Date……..

For and on behalf of.……

At……..

Email..……Telephone……..

4.3 Tradesmen, Rates and Hours

State the various categories of tradesmen, the actual hourly rates including travelling time and fares costs, profit, overhead charges, insurance's, provision of tools and social security costs but excluding Value Added Tax, as would be applicable for the tradespeople who would be engaged on the works.

We would employ the tradesmen at the rates shown

Tradesmen	**Mon/Fri 07.00/16.30 £/hour**	**Mon/Fri 16.31/06.59 £/hour**	**Sat/Sun/Hols 07.00/06.59 £/hour**	**Xmas/New Year 07.00/06.59 £/hour**
Fitter				
Fitters Mate				
Apprentice				
Foreman				
Labourer				
Welder				
Electrician				
Electricians Mate				
Controls Engineer				

Note: Tradesmen shall exclude office, store men, secretarial and similar personnel who are to be included in the overhead charges.

Signature……

For and on behalf of…….

4.4 Daywork Details

PERCENTAGE ADDITIONS
State percentage additions to be added to the net costs inclusive of profit, overhead charges, insurance's supervision, employers liability, provision of tools, plant, and scaffolding, and all other incidental expenses and 'on costs' including discounts for:

Item	Description	% Addition
MATERIALS	For which the net cost will be the actual net sum paid to suppliers after deducting discounts other than that for early cash settlement	
SUB CONTRACTORS	For which the net cost will be the actual net sum paid for approved subcontractors after deducting discounts other than that for early cash settlement	
PLANT	For which the net cost will be the actual net sum paid to suppliers after deducting discounts other than that for early cash settlement	

Signature……

For and on behalf of…….…….

4.5 SUB LETTING

The specialist firms that we propose to employ are:

……

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Signature……

For and on behalf of……

4.6 CONTRACTURAL PARTIES

Employers: Christian Action (Enfield) Housing Association Ltd

Consulting Engineer: DCH Consultant

4.7 DECLARATION

Unless and until a formal agreement is prepared and executed, this tender together with the Employers written acceptance thereof will constitute a binding agreement. We understand the Employer is not bound to accept the lowest of any tender.

We understand the provisional sums will be either be expended by instruction deleted partially or in full as instructed.

We the undersigned having read the Conditions of Contract, Tender Invitation and Specification and having examined the drawings referred to therein and having inspected the site, do hereby tender and undertake to provide and price all conditions, materials, labour, plant, and implements of every description necessary to execute and complete the whole of the works described and I/we agree to enter into a Firm Price Contract for the work in accordance with the Conditions laid down in the Specification and summary of tender.

If my/our tender is accepted I/we undertake to complete the whole of the works within the time period previously given from the date agreed for possession of the site.

I/we further agree that this tender shall remain open for acceptance within three months from the date of same.

4.8 FORM OF TENDER FOR THE WORKS

To: Christian Action (Enfield) Housing Association Ltd, Benedict House, 61 Island Centre Way, Enfield EN3 6GS.

SUMMARY OF TENDER PRICES FOR ROSECROFT BOILER AND DOMESTIC HOT WATER PLANT REPLACEMENT AT 3 FINSBURY ROAD WOOD GREEN LONDON N22 8QF

Tenders are to be submitted by entering prices against the items shown on the following Form of Tender. Having examined the attached specification, drawings, schedule of works and tender documentation and visited the property, we offer to undertake the work for the lump sum ex VAT as follows:

1.0	PRELIMINARIES	£.....
2.0	REMOVAL OF REDUNDANT PLANT	£.....
3.0	NEW DOMESTIC HOT WATER SERVICES	£.....
4.0	NEW BOILER PLANT	£.....
5.0	AUTOMATIC CONTROLS AND ELECTRICAL POWER SUPPLIES	£.....
6.0	TESTING AND COMMISSIONING	£.....
7.0	THERMAL INSULATION	£.....
8.0	GAS SUPPLY	£.....
9.0	NEW THERMOSTATIC & LOCKSHIELD VALVES TO 150 RADIATORS	£.....
10.0	PROVISIONAL SUM PLANT ROOM GULLY	£..6,000.00.....
11.0	PROVISIONAL SUM FOR CONTINGENCIES	£..2,500.00..……
TOTAL FIXED PRICE TENDER SUM (EXCL VAT)		£.....

We estimate that the time required to complete the works will be …….…… days
Mobilisation for time of order ..……..……..… days
Tender open for acceptance …….……months

SIGNED BY.....……DATE……

POSITION:……..

For and on behalf of……..……..

Address……

Tel No……..…Fax No……..……email…….……

ROSECROFT BOILER AND DOMESTIC HOT WATER PLANT REPLACEMENT

5.0 HEALTH AND SAFETY QUESTIONNAIRE

Please examine and consider carefully the tender documents, and drawings and the requirements to comply with the 2015 CDM Regulations and confirm the following:-

(1) Do you consider that the works will require four or less persons at anyone time on site? **YES/NO**

If 'NO' state maximum number of person on site at any one time and duration:

(2) Do you consider that the works will require less than 30 working days on site to complete? **YES/NO**

If 'NO' state the maximum working days you require on site to complete the works

(3) Do you consider there are any other items of Health & Safety information that should have been provided and which are not apparent in the tender documents? **YES/NO**

If 'YES' please list them:

(4) Do you consider there are any aspects which have involved unreasonably costly Health and Safety precautions to execute the work? **YES/NO**

If 'YES' please list them and provide details of any alternative suggestions together with the time and cost savings if they were to be carried out

(5) Do you consider there are any aspects not already included which would be likely to improve health and safety of people during construction and/or maintenance of the building? **YES/NO**

If 'YES' please list them and provide the time and cost implications if they were to be carried out:

Signed……..

For and on behalf of…….

Date……