PARTICULAR SPECIFICATION AND SCHEDULE OF WORKS

AT

LODGE PARK SPORTS CENTRE

134-148 Shetland Way
Corby
NN17 2SG

PREPARED FOR

Facilities Management - Corby Borough Council,
The Corby Cube, Parklands Gateway,
George Street, Corby,
Northamptonshire
NN17 1QG

BY

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PARTICULAR SPECIFICATION AND SCHEDULE OF WORKS

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PART III : MECHANICAL SERVICES PARTICULAR SPECIFICATIONS AND SCOPE OF WORKS

1.0 GENERAL

This particular section of the Mechanical Installation specification is to be read in conjunction with the preceding sections Parts I and II, and in particular the subsequent Schedule of Work, Rates and Quantities Part III and Appendices.

The work areas will be undertaken in compliance with the Principal Mechanical Contractors programme and sequence of the works in accordance with the specification schedules and Scope of Work, Rates and Quantities.

The specific upgrade requirements will be by the **Mechanical Services Contractor and who will be responsible for the role of Principal Contractor and CDM Duties as appropriate**. They will also carry out all BWIC with services requirements to enable the associated services upgrade works.

The Mechanical Contractor will be responsible for all essential modifications and new installations with alterations to the existing mechanical services described and covered by the Mechanical Services Specification and incorporated in the following Schedule of Works items which follow for each specific project location.

All work is envisaged to start within this heating season following initial surveys and set up site to be agreed prior commencement of survey/strip out for the main works to continue around normal operation and activities. Shutdowns for changeovers must be agreed with Consultant and Sports Centre Manager and in accordance with contract particulars (Also refer to Particular Section). The Principal Services Contractor must take all precautions and make all allowances to minimise and avoid wherever possible any inconvenience to the Centre through unnecessary cessation of services in areas which could be affected by these works.

All shutdowns must be carefully co-ordinated to include all sub-trades and time/duration must be agreed with the Client before proceeding.

Further details about the scope of works given later for this project as given in the respective Particular Specification.

The Mechanical Contractor should note that space is very restricted for the storage of materials on site and therefore wherever possible off-site storage facilities should be adopted as described in the Particular Specification and the Schedule of Works, Rates and Quantities.

Noise restrictions will apply and drilling and noisy activities must be kept to a minimum and by arrangement.

2.0 SCOPE AND GENERAL TO ALL REQUIREMENTS

We have produced separate particular specification for tendering the proposed Mechanical Installation upgrades with a common general specification section (Parts I and II) applies to this project. The particular requirements **Part III** specification with Appendices and separate tender breakdown for analysis, to offer client pricing options 1 to 3 (full breakdowns are required).

The work areas will be undertaken in compliance with the respective normal working day and sequence of the works to be agreed with consultant and centre manager and particularly for any out of hours working which must be agreed and approved by the Client and Consultant. Access restrictions will apply to deliveries during normal working day and the good lift has limited height but it may be used.

The specific upgrade requirements will be responsibility of **the Mechanical Services Contractor, who will be responsible for the role of Principal Contractor and include allowances to carry out all surveys and serve respective F10/H&S notices and CDM duties**, as appropriate and include for all safe access towers/scaffolds, BWIC with services requirements to enable the associated services upgrade works, as specified.

The Mechanical Contractor will be responsible for all essential modifications and new installations to the existing mechanical services described and covered by the Mechanical Services Specification.

The Principal Services Contractor must take all precautions and make all allowances to minimise and avoid wherever possible any inconvenience to the Centre and building M&E services through unnecessary cessation of services in areas which could be affected by these works.

All shutdowns must be carefully co-ordinated and minimised to include all sub-trades and these will need to be agreed with the Consultant and Centre Manager before proceeding.

The Mechanical Contractor to note that space is very restricted for the storage of materials on site and therefore wherever possible off-site storage facilities should be adopted as described in the Particular Specifications.

The Specification must be read in conjunction with the preceding 'Services Installations Materials, Practice and Workmanship' Parts I and II of the Standard Specification which precedes Part III Particular Specifications specific to the Centre.

All relevant clauses contained in the Standard Specification Parts I and II will apply to this Particular Specification and equipment requirements in its entirety.

The work areas will be undertaken in compliance with the Principal Mechanical Contractors agreed programme and include allowance for asbestos refurbishment surveys in advance of the proposed upgrade works complete with new flues/terminals and weathering by approved specialist contractor and roofing contractor, as appropriate

The Contractor will be responsible for the complete maintenance upgrade works and protection of the existing building and M&E supplies to provide new main heating and hot waters plant with new associated services to the existing building distribution systems, as indicated. The Mechanical Contractor is to provide all safe access and secure restricted area/compound for the duration of the contract in order to control all labour and sub-contractors necessary to supervise the works and ensure proper installation (with reference to the Sports Centre/CBC H&S brief. Also refer to CBC induction booklet).

In particular, with regard to Mechanical Services it should be noted the building will not be completely vacated during the course of the works as public will be using this centre, as well as other staff and maintenance teams who may be working or in occupation but safe secure independent access to be maintained for the normal working day (TBC) and plant rooms must be kept locked at all times. The Mechanical Contractor must take all precautions and make all allowances to minimise and avoid wherever possible any inconvenience to Centre/staff and visitors through unnecessary cessation of electrical and mechanical supplies in areas which could be affected by these works. **The Principal Contractor must allow for out of hours working deemed necessary and for all deliveries, otherwise normal working hours outside plant room or compound only by agreement but contractors may use the designated toilets.**

Notice must be given for agreed shutdowns that will generally be arranged and carefully co-ordinated by the Principal Mechanical Contractor with all other associated sub-trades. Reasonable notice and agreement with the Client and Centre Managers team will be required before proceeding with any shutdown works or changeovers or major deliveries.

The Contractor will be expected to carry out a thorough site survey and inspection of existing systems in order to produce detailed procurement schedule with working drawings as appropriate, for approval, prior to any prefabrication of pipework and alteration to existing services to help reduce inconvenience, deliveries, noise and out of hours work on site.

IMPORTANT TO NOTE: Asbestos survey register on site must be inspected prior to any works and specific queries regarding suspect materials to be advised to CA without delay to

arrange close inspection/sample testing. Although no asbestos should be present following visual inspection (refer to register and survey), existing ducts/shuttering or equipment may contain asbestos. Therefore, the Contractor must still be vigilant when carrying out his own investigations and inspections before they start work and as the work proceeds with particular attention when opening up boilers/flanges, ceilings, ducts and equipment casings. Specific queries regarding suspect materials to be advised to CDM-C, Consulting Engineer and Client Manager without delay to arrange close inspection/sample testing.

If there is any doubt about asbestos or should Contractors come across asbestos during the works (particularly when opening up ceilings/bulkhead and ducts) which are not listed, they must stop work immediately and report the problem to the Project Manager**. APEC Environmental Ltd, Rotherham, S60 1BY Tel.01709 364646 or Oracle Solutions, Kettering, NN16 8PX Tel : 0844 800 0801 or equal and approved equivalent** 'licensed asbestos contractor' should be employed by the Principal Mechanical Contractor for refurbishment survey and for any additional attendance that may be required or indicated to deal with any suspected materials.

As specified and generally indicated the Mechanical Contractor will be responsible for testing, recording results, surveying and verifying all the existing services affected by these works and prior to commencement of any work, to identify and establish **performance of ALL existing HEATING, HOT WATER and supplies to FANS/AHU systems** before any alterations are carried out. Following this, the Contractor must agree with the Consultant and Client representative all alterations to existing installations and proposals for complete removal of all redundant heating & hot water boilers with associated main pipework systems to be altered as indicated for **new installations including sports hall fans and designated radiator replacements.**

The existing pipework services which are to be diverted/modified must be left with appropriate labelling (temporary 'plant off' notices) to identify where the Mechanical Contractor safely isolated (valves noted) systems ready for new alterations and extensions for reconnection. Proper labels (for however short time period this may be) must be provided for the Clients Site Managers/Supervisors reference and to enable subsequent extension to be effectively and efficiently carried out. All open ends on new service pipes must always be covered and protected immediately until reconnected into the system. Working drawings to be produced and updated as the works progresses.

The Mechanical Contractor will also be responsible producing the necessary BWIC details and for liaising with specialists/ manufacturers and direct works Contractors to ensure all the requirements and recommendations are strictly followed. The new services should be set out and/or marked up by the Mechanical Contractor for the Consultant/Client to sign off prior to 1st fix (by the Mechanical Contractor).

It is important to Note **NEW SPIROTECH Air and dirt separator/Spirocross on common main** header is required **PLUS new X-Pot or equal and approved equivalent** on largest main VT circuit pump bearing in mind the mixed aged of installations but sampling/testing at commencement by the Contractor will be required to submit report within the first 10 days for consideration with respective specifications for flushing out all pre-operational contaminants from the system. When the system has been flushed through a heat test shall be carried out on the system and associated controls, and the tenderer will need to allow for suitable water treatment programme and introduction of suitable additional inhibitor for each heating system/circuit.

The water treatment to be in strict accordance with the boiler manufacturer's instructions and water treatment specialists recommendations for long term system maintenance; Contact Boiler manufactures in the first instance to check on any particular aspect of water treatment or recommendation by specialist such as; Fernox Manufacturing Co Ltd or Hercules Betz Dearborn (Sentinel Division).

Labelling to be fully encapsulated, and left attached to the main heating plant air and dirt separator (low loss header) and/or dosing pot if more suitable place. A copy of this information is also to be kept in the O&M manual.

All the existing combustion and mechanically assisted air supply ventilation systems and equipment are to be retained and tested/re-commissioned by the Mechanical Contractor as indicated. The Mechanical Contractor is to allow for all re-commissioning of new and modified plant preferably by the manufacturer and/or his own 'approved' specialist. The Contractor is to include for all new requirements as part of this specification.

All pre-commissioning cleaning, chlorination etc. will be carried out by an approved specialist to the satisfaction of the Client and Consultant.

Samples for each cleaned and treated system must be taken after 2 weeks of use and sent to an independent laboratory for analysis and confirmation that the systems have been satisfactorily cleaned/treated and therefore fit for public use.

3.0 CONTRACT PARTICULARS AND PRELIMINARIES REQUIREMENT

Please refer to the Preliminaries which form part of the tender package.

It will be the responsibility of the Principal Contractor to provide the Services Subcontractor's with all relevant details of the Main Contract to follow from the Client/CBC.

Specific Preliminary items

The Principal Mechanical Contractor must allow for management costs within their price.

The Contract

The Contract to be prepared by the Client will be based on the Agreement for Minor Building Works with Contractors Design – JCT 2016 Edition

III **PARTICULAR SPECIFICATION AND SCHEDULE OF WORKS FOR LODGE PARK SPORTS CENTRE**

Site Address: Lodge Park Sports Centre, Shetland Way, Corby, Northamptonshire, NN17 2SG

Sports Centre Leisure Manager: Kevin Williams, Tel: 01536 400033, Mob: 07763 876712

NEW MAIN BOILER PLANT AT LODGE PARK SPORTS CENTRE

1. SCOPE OF WORKS

A) General

Provide TWO new twin LPHW condensing heating boilers and associated plant with main pipework system alterations to replace six Ideal Concord Super S4 50 modular heating boilers and associated primary pumps but upgrade and replace main isolating and regulating valves, CT & VT system circulating pumps and motorised control valves, complete with new air dirt separator as part of new low loss header arrangement PLUS X-Pot on VT circuit with new 3-port motorised control valve on flow (currently on return) and new VT pump on mixed flow with new additional main F&R for separate circuit to Crèche for independent control. In addition Isolate and remove F&E tanks open vent and cold feed to be replaced with new Mikrofill-3 or equivalent sealed system F&E expansion system and vessel, with all associated upgrades to existing automatic control panel as specified for plant room – refer to quotations appended.

Retain existing incoming main supplies, all domestic water services and general heating/distribution pipework but **replace two Lochinvar CE600auto 139kw 245litre direct acting hot water storage boilers (one out of order and currently beyond economical repair) with new high recovery efficient cylinders (complete with solar pre-heat option**) as specified with new CT primary also served from new boilers complete with new flues, new duty/standby system pumps & F&E equipment with associated control panel upgrades as specified. **Replace Sports hall fans on point for point basis** but generally retain other existing AHU's, **designated radiators,** pipework circuits (except **where indicated** otherwise) and controls fed from boiler room as specified. Retain existing gas meter and automatic gas safety shut off valve system, subject to satisfactory test and re-commissioning of gas supply pipework entering boiler room. New condensate to existing foul drainage/gulley required in plant room as part of these works complete with new interfaces and safety shutdown system with relay/connection to existing fire alarm system as specified to shut down system and gas supply but final Fire alarm interface connection by the clients specialist.

Isolation, de-commissioning and removal of six existing Gas fired boilers and two direct acting DHWS boilers in first floor plant room, complete with Flues (see asbestos survey) but retain separate zone/mains pipework circuits at point of entry to boiler room for modification as specified for new pumps, extra main F&R pipework circuits and automatic controls for respective Sports Centre zones utilising **new Magna1D 50~150 VT** or equivalent duty/standby pump set with extra main branch circuit modification from plant room to serve Crèche after new 3-port installed required on mixed flow (currently 3port on return) plus **two single Magna1 40~60 CT or equivalent pumps** for AHU's and **new HWS cylinders (two required as specified in parallel with solar pre-heat buffer vessel)** installation **and new DHWS secondary return pump**. Existing main flow and return pipework to be upgraded with new IV/RIV within plant room for each existing circuit/system, as distribution pipework and heaters generally appear to be in reasonable working order and to be retained except for **TWELVE designated radiators** to replace existing panel radiators **complete with new Herzcules public service TRV's with 10 degC tamperproof control head and matching double regulating lockshield valve** on return, as manufactured by Herz or equal and approved equivalent.

The mechanical contractor is also to **replace TEN 450mmDia existing wall terminal fan units in sports halls** as indicated on point for point basis **including all associated BWIC, power and control wiring for reversing speed control and overhaul SIX passive roof vents/cowls.**

Supply and Install New : **TWO** Gas fire condensing heating boilers; each as manufactured by Remeha, type GAS Quinta ACE **160** cascade/modular boilers or equivalent complete with all ancillaries, flue condense kit and new stainless steel flue header and liners required to rise within existing openings to new roof terminal as manufactured by A1 Flues or equivalent, complete with condense traps to drain in accordance with manufacturers guidelines and recommendations. New Spirocross or equivalent air dirt separator low loss header with modifications to fully insulated two pipe heavy weight mild steel heating pipework headers and new Grundfos Magna1 or equivalent system pumps for duty/standby operation on VT and one for each CT circuit (HWS & CT but LPHW boiler primary pumps supplied as part of cascade). In addition, supply and install new Mikrofill-3 or equivalent F&E unit with 300 litre (min) expansion vessel and upgrade controls as specified. Retain and reuse existing mechanical assisted supply air and ventilation/louvres to provide ventilation with existing high-level ventilation louvred cowl to suit new plant in accordance with regulations.

All new fully insulated pipework services and alterations required within the boiler room including new isolating and regulating valves for each main branch/circuit but main pipework exit/entering plant room can only be retained if reliable from point of

entry to boiler room and as existing distribution pipework is to be retained, subject to satisfactory test and recommissioning.

Upon receipt of order the Contractor to organise a detailed survey without delay for performance check of installations and specifically with regard to the proposed work which must be carried out during normal working hours prior to removal of any equipment or plant. Phased enabling works, strip out and prefabrication will be required to minimise changeover time for new systems which must be tested and left fully operational during normal working day for Sports Centre activities. Associated making good and remedial works to be carried out by approved builder employed by the successful tenderer including redecoration works necessary.

Important to note : Maintain the integrity of all main supplies and domestic H&C water services at all times to rest of Sports Centre.

Carry out and demonstrate all new associated services commissioning before finally setting to work completed installation with draft manual/test certificates for final demonstration and snagging list to be completed for handover.

Following each work stage, the services must be left fully functional under automatic control to prove system. Heating system must be proved with full load/heat test as part of final commissioning during the heating season.

Electrical services described within this specification will also be the responsibility of the Principal (Services) Contractor. Allow for placing orders, organizing and liaising with the specialist Control Systems manufacturer who will be responsible for supply and installation of the requisite automatic control panel(s) upgrade and associated wiring within plant room as part of this contract. The mechanical contractor will also be responsible for all builders work, scaffolding and any asbestos removal that may be required.

B) Removal of Redundant Services

As specified and generally indicated the Services Contractor will be responsible for surveying the existing services before any work commences on site and for identifying, establishing and subsequently agreeing with the Consultant which are to be made redundant and highlighting any discrepancies found.

All obsolete tanks, redundant pipework, boilers, flues and associated electrical works are to be removed by the Services Contractor without delay and must not be allowed to accumulate except where reused and/or agreed otherwise. Obsolete

materials and debris must be safely and properly disposed of by the Services Contractor with due regard to all Health and Safety precautions. A 'licenced asbestos contractor' should be in attendance as indicated to deal with any suspect materials found when dismantling boiler and flues. **Asbestos Management report and refurbishment survey inspection with register to be kept** on site for inspection by all contractors and for all trade persons attention prior to any works.

All services which are to be reused and/or extended are to be carefully identified and proved before they are cut off and modified at point of entry into the boiler room. Proper labels (for however short time period this may be) must be provided to enable subsequent extension to be effectively and efficiently carried out. All open ends on existing service pipe must be covered and protected immediately until reconnected into the system. Working drawings to be produced and updated as the works progresses.

C) Associated Builders Work

The Principal Mechanical Contractor will also be responsible for the following which applies to the **boiler house(s) only** :-

(a) Clean down and degrease existing floors, and make good walls and ceilings immediately after removal of redundant plant and services and allow for sealing/painting walls and ceilings and upgrading plant room floor with sealed protective anti slip floor paint. After completion make good and touch up any areas which may have been affected by new services works. Refer to Section which follows for all Painting requirements.

(b) Re-level floor and/or construct new plinths to extend/replace existing bases as required for new free-standing boilers and fame/cascade equipment. Infill with standard in-situ concrete mix reinforced with wire mesh and smooth trowelled finish and insert metal rods dowelled into the edge of the existing plinths at 100mm intervals.

(c) NOT APPLICABLE.

(d) Contractors container/compound, all barriers/Heras fencing and scaffolding (if applicable) and works in connection with new flue liners and removal of old plant etc min order to provide independent safe and secure compound/access via carpark with lockable access gates to side of Sports Centre that must not be blocked off. Shared fire escape routes from Sports Centre must be maintained (refer also to appendices)

(e) NOT APPLICABLE.

(f) NOT APPLICABLE.

(g) At Least 3 weeks prior to any works the contractor must refer to Asbestos Survey Report and employ licensed specialist to carry out asbestos refurbishment survey for the working areas and report to be issued within 14 days to serve respective notices. This requirement is in addition to any register available or issued by CBC as management plan or previous non-intrusive survey may not be satisfactory under latest legislation – further information to follow from CBC regarding risk of **Asbestos but associated removal works and respective timeframe allowances would need to be included as part of proposed contract programme for this all to be safely completed in advance of main contract/installation works. Tenderer to allow for all arrangements and surveys required by licensed specialist to be approved by CBC, contact APEC Environmental Ltd, Rotherham, S60 1BY Tel.01709 364646 or Oracle Solutions, Kettering, NN16 8PX Tel : 0844 800 0801 or equal and approved equivalent specialist and for tender purposes but include all allowances to manage and complete the specified works.**

New Equipment and Services Alterations

The Contractor is to supply and install all of the following equipment generally in accordance with the relevant preceding sections of the specification and all associated M&E services installation drawings and schedules.

Orders may only be placed after the Client and Consultants approval to proceed has been given.

NO ALTERNATIVE EQUIPMENT WILL BE ACCEPTED WITHOUT THE CONSULTANTS PRIOR APPROVAL. THE CONTRACTOR MUST THEREFORE ALLOW FOR THE SPECIFIED EQUIPMENT ONLY UNLESS OTHERWISE AGREED DURING TENDER STAGE. FAILURE TO FOLLOW THIS REQUIREMENT WILL RESULT IN THE EQUIPMENT BEING REMOVED AND REPLACED AT THE CONTRACTORS OWN EXPENSE.

D) Existing Main Supplies

(a) Electrical Supply

Main supply cable(s) to be checked and upgraded if required for new plant supplies and upgrading control panel.

At the appropriate stage upgrade existing Automatic Control Panel by an approved Control Systems specialist and all associated supplies and wiring required under this contract.

(b) Tank Room

Contractor to allow for conversion to sealed system. Check and verify all old tanks disconnected and moth balled or removed but obsolete cold feed and open vent pipework to be removed and holes/sleeves fire sealed through plant room penetrations.

(c) Gas Supply

The existing incoming gas main enters the respective boiler room. THE CONTRACTOR MUST ENSURE THE GAS MAINS ARE ADEQUATELY PROTECTED AND ISOLATED AS APPROPRIATE DURING THE COURSE OF THE WORKS, BUT THOSE SERVING THE OTHER HWS BOILER MUST BE MAINTAINED AS WELL AS ALL THE OTHER BUILDING SERVICES DURING THE COURSE OF BOILER REPLACEMENT WORKS.

Retain existing main supply pipework and respective gas solenoid valves but install new heating boiler pipework header with new main GC on branch to replace existing for new boilers required as part of these works. New branch GC and modification to existing supply as appropriate to serve new boiler plant. The approved control system specialist or Fire Alarm contractor to connect between fire alarm relay and safety shut-off system in existing control panel.

(d) Water Supply

The existing water supply to the building(s) and mains tank feed generally appear to be in order (refer to water Hygiene report) but reconnect main to new Mikrofill-3 or equivalent F&E system and/or equal and approved RPZ anti-vac/check valve as appropriate for WRAS/Local authority requirements. Water hygiene report to be checked and survey required at the outset to ensure the building water systems are fully compliant and no dead legs or ongoing issues.

E) Existing Boiler House & Associated Equipment

New F&E System – MicroFill-3 or equivalent (300litre/1bar)	Contractor to check/verify size/location/operating system pressure and report on water treatment/ condition.
Allow for testing and commissioning pressurisation unit and expansion vessel(s).	Change over from old system will be subject to access/constraints and programme to be agreed.
Ventilation:	
Check and confirm to verify adequate low and high level ventilation with review to rationalise existing to suit new boiler plant, in accordance with BS/Regulations.	Retain and upgrade mechanical assisted ventilation louvres/grillage at high level. For purposes of tender allow for cleaning overhauling and upgrading as indicated and to confirm satisfactory to meet current BS/requirements.
Other Notes:	
	Existing LTHW pipework to be modified as generally indicated and existing/new pipework in plant room to be completely refinished in metal clad with new extensions/alterations fully insulated as specified.

F) New Automatic Control Services

Supply and install automated controls for the following new equipment and ancillaries in accordance with this specification.

In order to ensure compatibility and negate potential issues or project complexity the control system must be modified for pant replaced and upgraded with new equipment but design, control panel alterations/manufacture, field controls, BMS controller & touch-screen, electrical installation and commissioning shall be sourced

from a single, independent BMS Controls Specialist contractor who shall have all of the following in-house facilities;

1. Design and manufacture custom-built site-specific control/extension panel.
2. Supply BMS controllers and user-friendly touch-screen display (housed within the control panels and accessible with controlled access levels/codes to be agreed)
3. Provide electrical installation in connection with BMS/control systems in accordance with GGA master specification for workmanship and standards that will apply to this particular project.
4. Site specific software design/engineering to suit site specific equipment and particular specification.
5. Provide commissioning of BMS/control systems and separate client demonstrations upon completion and at the start of the next heating season (date TBA)
6. Provide maintenance of installed BMS/control systems for the first 12 months and provide quotation for annual PPM thereafter.
7. Ability to provide off-site BMS monitoring facilities with out-of-hours response if required by the client in the future.

BMS contractors who cannot provide <u>all</u> the above or who provide any of these services via sub-contractors or separate suppliers shall not be considered.

The control specialist and contractors should be based within a 1-hour response time or 30 mile radius of the site to keep the environmental impact of project delivery to a minimum and promote speedy site response during the contracted work and for the 12 month defect liability period.

The controls specialist must be an accredited partner of the BMS manufacturer being proposed and as such, must demonstrate to the manufacturer that they satisfy qualification criteria and undergo regular formal audits to ensure their activities continue to meet the manufacturer's required standards.

The successful tender will be expected to confirm the specialist contrails contractor at time of tender and before any orders are placed, subject to agreement to contract programme.

(a) <u>Gas Supply</u>

Retain and test/recommission gas main from existing meter (not utilities supply below ground level) and existing safety solenoid shut-off valves/branches on supply to boiler room with thermal link/knock off button by door and Fire alarm interface by the Sports Centres specialist (TBC). Supply and install new main header from

existing gas supply with 32mm GC/branches to each boiler with purge/test point on new 50mm (min) pipework header to new heating boilers.

(b) Optimiser/Compensator (to be incorporated in control panel(s) by AES or equivalent control system specialist)

BMS based night set back, optimiser and weather compensation controller required with web browser/IT/alarm interface facilities. Sequence control included and rotation for Summer/Winter lead/lag boilers, duty operation and separate zone/extension timers with manual overrides and rotation switches for duty/standby pumps sets and push button count back extension timers for each zone.

Separate time switch channel included for heating and operation of respective new duty/standby heating pumps, internal/external sensors, common/mixed flow and system return sensors with high limit protection provided on heating systems.

CONTROLS

3	Room temp Sensors (VT heating & AHU1)
1	Duct temp. sensor (AHU 2)
1	Outside air temp. sensor
3	40 mm, 3-port motorised valves (VT heating AHU1 & AHU2)
2	25 mm, 3-port motorised valves (HWS)
3	Electro-thermal links
2	Immersion sensor (boilers common flow & return)
1	Immersion sensor (VT valve control)
2	Immersion sensor (DHWS monitor)
2	Duct thermostats (AHU1 & 2 fan hold-off)
2	Room thermostats (small sports hall heating)
1	BMS Controller & I/O modules
1	BMS HMI

Option

4	25 mm, 3-port motorised valves (sports halls heating)

CONTROL PANEL

Wall mounting single section BMS enclosure providing control of the heating, DHW & AHU plant.

ASSOCIATED ELECTRICAL INSTALLATION

- Disconnect and strip out wiring to;
    - Electro-thermal links above old heating boilers
    - Boiler sequence panel, flow switch, immersion sensor and 6 No. boiler modules
    - Boiler circulation, VT and CT heating pumps
    - VT valve and immersion sensor
    - 2 No. Gas Fired Water Heaters
- Relocate existing gas sensor & socket outlet (for space for new BMS enclosure)
- Modify thermostat wiring within sports halls
- Fit aforementioned BMS enclosure and then install wiring to:
    - 3 No. Electro-thermal links
    - 3 No. new Boilers
    - 3 No. Boiler circulation pumps (from boilers)
    - Boiler flow & return sensors
    - New CT & VT pumps
    - New VT valve and immersion sensor
    - New DHWS immersion sensors
    - New DHWS Control valves
    - DHWS circ. Pump (relocated)

SOLAR WIRING OPTION:

- From existing control panel wire power supplies to Solar Controller and Solar hi limit thermostat / valve.
- From Solar Controller install wiring to;
    - Fault signal to existing control panel
    - Grundfos or equivalent flow sensor
    - Vessel sensor
    - Collector sensor
    - Solar pump
    - Solar Pasteurisation Pump
    - Heat Meter
- From Solar Heat Meter install wiring to;
    - Associated temperature sensors
    - Volume flow sensor
    - Existing control panel

The installation will comply with the latest IEE regulations. Power cabling to be LSF 6491B singles and controls cabling to be CY screened. This cabling will be installed in galvanised conduit/trunking within plant room and risers.

COMMISSIONING OF CONTROLS

- Remove old controller from existing control panel and blank-off aperture
- Modify existing control panel for new BMS control
- Install interconnecting wiring between new BMS enclosure and existing control panel

Upon completion of the installation the control system MUST be fully tested and commissioned assuming the following:-

i. Any electrical installation not covered by the controls scope is complete and tested.
ii. Gas/oil is available and systems are filled.
iii. A permanent electrical supply is available.
iv. Continuity of the site work is available.

Any handover or pre-commissioning visits must be included.

Abortive visits must not be charged or passed onto client/CBC.

Note: Refer to tender analysis cost options for client and ensure quotations allow for the following:-

a. New room thermostats included for the Sports Hall heating. Option price to be detailed for replacement valves for the Sports Hall heating.
b. Complete control, electrical supplies or required contactors and installation associated with the electric immersion heaters.
c. Tender includes for the supply of any controls associated with the Solar DHWS Pre-Heat plant. The entire installation would be supplied by the mechanical contractor and include for the associated electrical installation of such.

In the absence of any further detailed information in the specification/information regarding installations, prepare quotation on the basis of the existing electrical installation being compliant with BS 7671 and adequate for the additional works.

(c) Proposed Heating boilers:

Supply and install TWO new Remeha Gas **160 ACE** condensing boilers or equivalent or equivalent each complete with flue condense kit to Deltavent SF or equivalent manufacturers to BS EN 1856-1 and constructed from 0.71mm thick 304 grade fully seam welded flue and components with spigot location and sealed V-band jointing

system (carrying minimum 4 hour fire rating certificate) header with 45 degree elbows to double 45 degree base tee and drain for flue(s) rising vertically approximately 4metres from boiler spigot and through existing windavent terminal to new termination at least 1m above parapet wall. Complete flue system to be supplied and installed by flue specialist, Messrs A1 Flue systems or equivalent approved specialist.

Include terminals, storm collars/flashings and upstands, site survey, working/record drawings & documentation, secure safe bracketry and access equipment/scaffold, boiler adaptors, sleeves, new class 1 flue components, ½" BSP test points per appliance, access towers/platforms, condense traps/drain points in accordance with regulations and boiler manufacturer's guidelines.

In addition supply and install new Spirocross or equivalent low loss air/dirt separator as part of SMART cascade/manufacturers supply. Also supply and install new X-Pot on new Magna1D VT or equivalent duty/standby twin head invertor driven circulating pumps and separate Magna1 or equivalent pumps for each CT circuit as specified but all other circuits/zones to be reused with new separate main regulation/isolation valves as indicated. NB: shunt pumps as part of boiler package cascade with boilers to be supplied as specified complete with cascade system for each boiler complete with new stainless-steel flue systems and flue terminal/liners, plus weathering by approved builder/roofing Contractor.

CONDENSING HEATING BOILERS and ancillaries required plus manufacturers commissioning for extended warranty or equal and approved equivalent, for example:

Product	**Description**
2 x 7625903	Quinta Ace 160
2 x L002-2	Comm-Quinta/110/120/GAHP(2)
KTS00253	Cascade for 2 x Quinta Ace 160 Boilers - Free standing in line

Kit contains:

- 1 x 111699 - Flange blank gas DN65
- 1 x 111703 - Flange blank water DN100
- 3 x 111807 - Set Screw
- 2 x 7611804 - Insulation Set Ace Cascade
- 3 x 7612941 - I-leg Ace cascade
- 2 x 7613401 - Insulation Set Pipes QP Ace
- 1 x 7614795 - L2 DN100 Ace
- 2 x 7621566 - Frame between legs Ace cascade
- 2 x 7622701 - Connection set straight Ace
- 2 x 7631858 - Insulation back Ace cascade

1 x 7641015 - Mounting Plate Control Ace

Plus:

XC100FK45	Rem-DS Air Dirt Separator DN100
TBX100	Insulation for Dirt Separator DN100 (100mm)
2 x 7637223	Pump QAce 160 - UPMXL 25-105 180 Auto (230v 50/60hz)
2 x MG410081165	Siphon h=150
2 x MG410085130	Condense drain 100dia

(d) DHWS:

The contractor is to supply and install **new UPS 15-50 bronze DHWS secondary return pump and two new 300 litre Lochinvar high recovery enamelled lined steel HWS indirect cylinders** or equivalent each complete with unvented system kits/expansion vessels, correx powered anode kit, 6kw (3phase) immersion heaters and associated back up power supplies with contactors **PLUS solar buffer/pre-heat option** with destrat pasteurisation pump kit flat plate solar collection package to replace existing main DHWS plant, and include for all equipment listed below or equal and approved equivalent. Refer to appendices for further details/schematic.

Item Number	Description	Qty.
SIVS66GE	300 LTR SINGLE COIL INDIRECT WATER HEATER *Enamelled steel,Maximum pressure 8bar,300 litres storage,45kW coil,1,083 litres @ 50°C rise maximum in first hour*	2
WH90-SIVS66	1" UNVENTED KIT COMPLETE WITH 1" T&P VALVE *Kit includes: 1x Pressure reducing valve, 1x Manifold/Non-return valve, 1x Temperature and pressure relief valve, 1x Tundish*	2
V35-B	EXPANSION VESSEL - 35L 3.5BAR C/W MOUNTING BRACKET	2
LM900043	IMMERSION HEATER ASSEMBLY - 6KW 1/3PH *Immersion Heater (Immersed Length 15") - 6 kW 1 ph / 3ph c/w 2¼" Adaptor Plate for models LST66GE. LST100GE & LST110GE*	2
LV310545	CORREX POWER ANODE KIT - SINGLE ANODE	2
	Solar	0
LSPA03	3 no. LSP20+ FLAT PLATE SOLAR COLLECTOR PACKAGE *3no. LSP20+ Flat Plate Solar Collectors complete with A Frame*	1
SOLPAK1	SOLAR CONTROL PACKAGE *Pump Station and Control package for up to 4 Flat Plate Solar Collectors*	1
PHV480UV	SOLAR PRE-HEAT VESSEL PACKAGE c/w UNVENTED KIT *480 litre capacity Pre-heat Vessel complete with Unvented kit and Expansion vessel*	1
WH9S	SOLAR PASTEURISATION PUMP KIT *Solar Pasteurisation Pump Kit*	1

(e) Primary Boiler shunt pumps:

For Each boiler: Supply and install new primary heating system pumps and pipework and control/signal as part of new low loss header from boiler connections with new reverse return pipework (equal loop length connections to each boiler) – refer to manufacturers schematic and installation instructions.

(f) Space Heating Pumps: Duty/Standby

Supply and install New Grundfos Magna1D or equivalent Twin head system pump sets for duty/standby pump arrangement to serve Sports Centre VT heating zones with new main branch to Crèche for independent control if required plus two new CT pumps for AHU and primary HWS, and each zone/circuit with new regulation/isolating valves within boiler room, as follows for example:

CT Zone 1 – MAGNA1D 40-60 F 220 1x230V PN6/10 or equal and approved equivalent duty and standby single head variable speed glandless circulator energy efficiency index 0.22

VT Zone 2 – MAGNA1D 50-150 F 220 1x230V PN6/10 or equal and approved equivalent duty and standby single head variable speed glandless circulator energy efficiency index 0.21

All zone pumps must be of the canned-rotor type, which means that pump and motor form an integral unit without shaft seal and with only two gaskets for sealing. The bearings are lubricated by the pumped liquid.

The MAGNA pumps for example is a pump with no maintenance requirements and with extremely low life cycle cost.

Characteristic features

- AUTOADAPT
- FLOWADAPT and FLOWLIMIT (reduces the need for pump throttling valves)
- Proportional-pressure control
- Constant-pressure control
- Constant-temperature control
- Differential temperature control (requires an additional temperature sensor)
- Constant-curve duty
- Maximum and minimum curve duty
- Automatic night setback
- Heat energy monitor
- No external motor protection required

- Innovative clamp ring with only one screw enabling easy repositioning of the pump head
- Insulating shells supplied with single-head pumps for heating systems
- Large temperature range due to air cooled electronics

Communication

- Wireless communication for example with Remote app
- Fieldbus communication via CIM modules
- Digital inputs
- Relay outputs
- Analog input

The MAGNA for example, is a single-phase pump and characterised by the following

- Controller integrated in the control box
- Control panel with TFT display on the control box
- Control box prepared for optional CIM modules
- Built-in differential-pressure and temperature sensor
- Cast-iron pump housing (also available in stainless steel versions)
- Carbon-fibre-reinforced composite rotor can
- Stainless-steel bearing plate and rotor cladding
- Aluminium alloy stator housing
- Air-cooled power electronics
- Motor and electronic controller

The MAGNA for example incorporates a 4-pole synchronous, permanent-magnet motor (PM motor). This motor type is characterised by higher efficiency than a conventional asynchronous squirrel-cage motor.

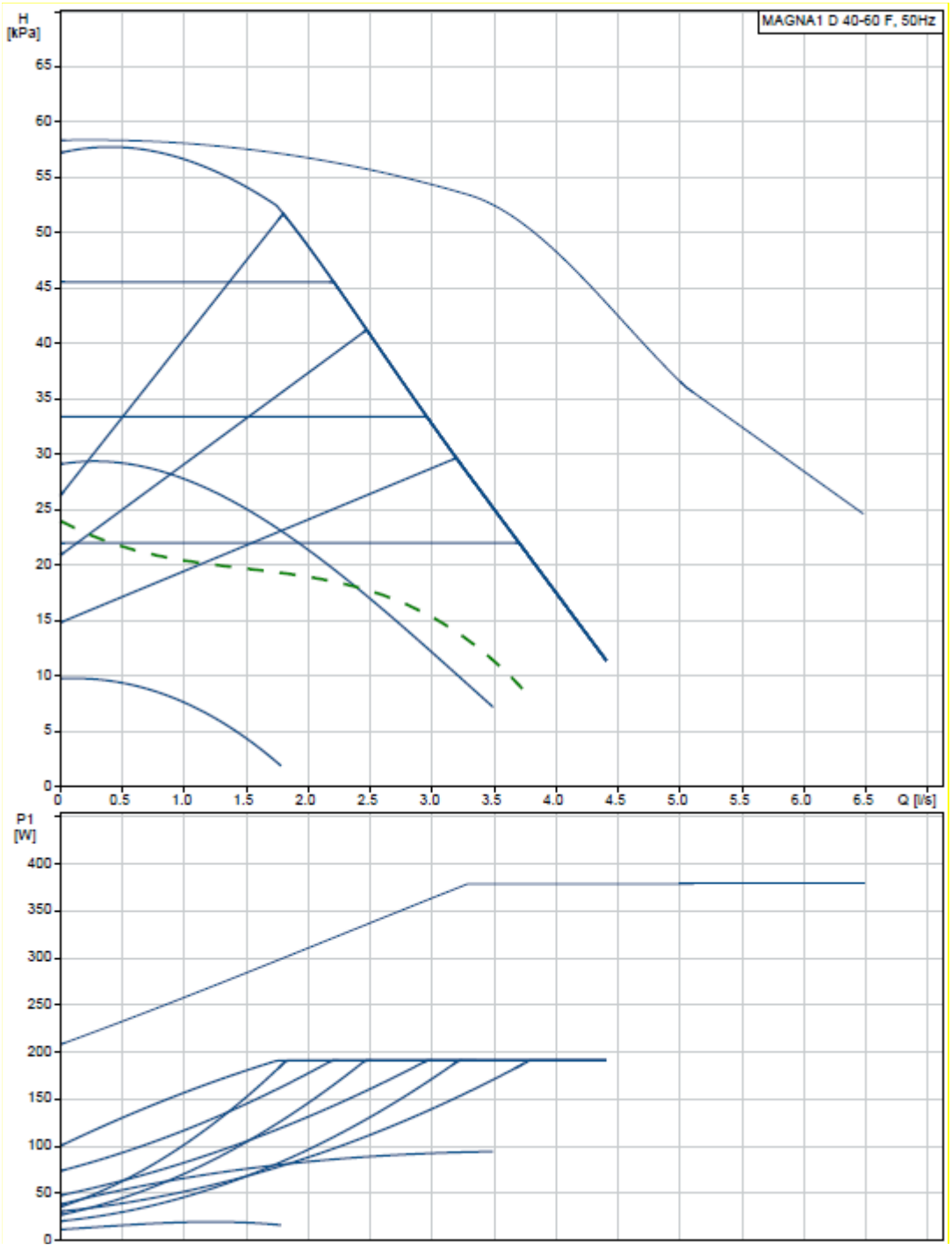
Pump speed must be controlled by an integrated frequency converter.
Liquid:
Pumped liquid: Water
Liquid temperature range: -10 .. 110 °C
Selected liquid temperature: 60 °C
Density at selected liquid temperature: 983.2 kg/m³
Technical:
TF class: 110
Approvals on nameplate: CE ,VDE ,E AC,CN R OHS ,WE E E
Materials:
Pump housing: Cast iron
E N-GJ L-250
AS TM A48-250B
Impeller: PE S 30%GF

Installation:
Range of ambient temperature: 0 .. 40 °C Max. operating Pressure: 10 bar
Flange standard: DIN

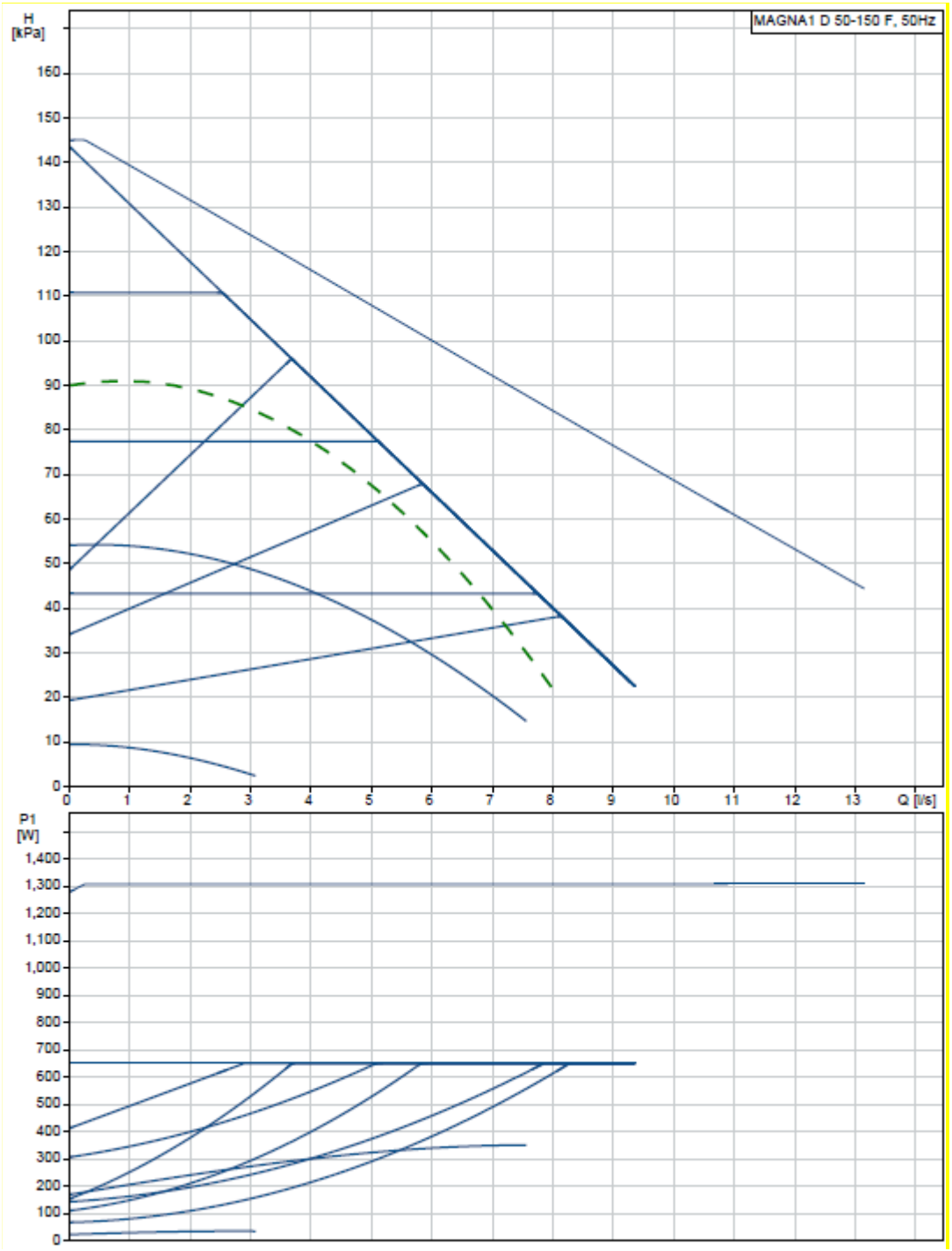
Pipe connection: DN 40 (Zone 1) and DN 32 (Zone 2)
Pressure rating: PN6/10
Port-to-port length: 220 to 280mm
Electrical data:
Power input - P 1: 12 .. 194 W and 23.77….653w respectively
Mains frequency: 50 Hz
Rated voltage: 1 x 230 V
Maximum current consumption: 0.11..1.58 A (Zone 1)
And (Zone 2) 0.26…2.88 A respectively
Enclosure class (IE C 34-5): X 4D Insulation class (IE C 85): F

Energy (EEI): 0.21 - 0.22

CT Zone 1 - Duty and performance must be plotted against existing UPSD 40~30 pump curve for consideration of any equivalent pump with system flow rates that must be checked and confirmed for consideration by consultant and for approval before draining down or decommissioning existing system.



VT Zone 2 - Duty and performance must be plotted against existing UPSD 50~120 pump curve for consideration of any equivalent pump with system flow rates that must be checked and confirmed for consideration by consultant and for approval before draining down or decommissioning existing system.



(g) Feed and Expansion Equipment:

Supply and install New Mikrofill-3 or equivalent F&E unit complete with respective 300/1.0 bar expansion vessels and ancillaries including quick fill arrangement:

Existing tank F&E system to be safely isolated and removed. Pipework checked and size/head to be confirmed prior to any alterations to system to current WRAC regulations and issue report on size/water content and condition of closed LPHW system; Suitable location and pipework to be checked and size/head confirmed prior to any orders or alterations to system and following the contractors' initial survey and report to client and consultant, to confirm size and condition of existing system. All vessels and charge pressure to be tested when empty and any new equipment or controls will need to be commissioned upon completion.

(h) Water Treatment:

Fernox or equivalent (See G(a) below).

(i) Boiler Flue System:

Supply and install new separate stainless steel flue for each boiler to new roof terminal, all associated builders work/weathering and access for new liners within existing shaft/roof openings, complete with new terminals/soaker plates and upstand curbs subject to satisfactory inspection. A1 Flue system or equal and approved installer if offered at time of tender.

At this stage allow for all associated builders work/weathering and access/openings for surveys and new flues within existing shaft to new terminals with soaker plates and upstand curbs. All subject to satisfactory survey and inspections included as part of the works. Include for all associated removals, additional BWIC/openings, access/scaffold guard rails and platforms by a Licensed and CBC approved Scaffolder Contractor and make good following installation, to match existing finishes as appropriate.

Flue System - Deltavent or equivalent multi-purpose, twin-wall, prefabricated Stainless Steel duct system manufactured for the conveyance of all associated products of combustion from a wide range of combustion and process equipment, capable of withstanding continuous flue gas temperatures of up to 760°C and designated as (H1) for pressure resistance in accordance with BS EN 1856-1.

The Flue systems to be designed for:

- A four hour fire rating is specified
- A watertight flue system is specified

Application Examples

- Fan Assisted Flue System & Condensing Boilers
- Oil and Gas Fired Boilers

- Incinerators/Cremators: use heavy duty flanges for jointing (Ultra seal)

Quality Assurance - The complete range of components are to be manufactured, tested, and where required, installed within scope of stringent quality controlled conditions in accordance with EN ISO 9001:2008 and BS EN 1856-1/2:2009 chimneys-requirements for metal chimneys with system(s) of assessment and verification of constancy of performance of the construction product as set out in Construction Products Regulation (2011) Annex V: System 2+ BSI certification issued for factory production. When requested, Flue System manufacturer shall submit copies of type test reports relating to product performance in addition to the "Certificate of Registration" administered by the British Standards Institute (BSI) and have EC-DECLARATION OF CONFORMITY Issued in accordance with the Construction Products Regulation (2011) EU No: 305/2011 for multipurpose double wall insulated stainless steel flue/chimney product to take both positive and negative pressurised waste gases and combustion Products from appliance to atmosphere.

Fire Rating - The flue system must be successfully assessed by the Loss Prevention Council for Fire Resistance. A fire rating of 4 hours to be achieved in accordance with stability and integrity criteria of BS 476: part 20. If required, Flue System manufacturer shall submit all test reports in support.

Construction - Deltavent flue or equivalent sectional lengths/fitting components to be fabricated in a variety of diameters and lengths with continuously welded vertical seams. The system to utilise four insulated/non-insulated annular variation options to provide a required minimum external case surface temperature. Inner liner coupler characteristics consist of male and female connection sockets complete with a 10mm 90° right angled flange formed at either end of all components. Joints shall be secured by clamping an externally fitted V-Band over the mating flanges of the adjoining components. Sealant, available from Flue Systems manufacturer, should be applied to the inside profile of the V-Band and to both flange faces before installation. Closure of the space between parallel external case components shall be achieved by first inserting a pre-cut length of insulation into the annulus void between the joining lengths and securing it into position using a profiled Clamp Band which locates within the grooves formed in all outer cases.

Product Description- Standard Number:

EN 1856-1: 2009. The standard for system chimney products - requirements for metal chimneys. Comprising of a series of essential harmonised European Standards and elements for both single and multi- wall chimney products with rigid metallic liners.

EN 1856-2: 2009. Requirements for metal chimneys- part 2: Metal flue liners and connecting flue pipes. Relates to the essential harmonised European Standards and elements of all products used to convey the products of combustion from appliances to the outside atmosphere.

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), all the provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the above standard(s) under system 2+ are applied and that the factory production control fulfils all the prescribed requirements. All components are manufactured to BS EN 1856-1-2:2009. Chimneys Requirements for Metal Chimneys. British Standard Institute (BSI) Certificate number:
0086-CPR-599465.

The CE Designation Scheme

The compliance of a chimney system product to the relevant technical performance characteristics according to the designation scheme is described by the following example.

Product Description	Product Designations						
System Chimney Product	EN 1856-1	T450	H1	D	V1	L20091	G(50)
Metal Flue Liners	EN 1856-2	T160	P1	W	V1	L20056	0(50)
Connecting Flue Pipe	EN 1856-2	T200	P1	W	V2	L50056	G(50)
	Standard Number	Temperature Level °C	Pressure Level N,P,H	Condensate Resistance	Corrosion Resistance	Flue Liner Specification	Soot Fire Resistance

Product Specification

Deltavent flue system or equivalent twin-wall stainless steel prefabricated chimney system with a 25/50/75/100mm thick Rockwool high density insulation. Dependent on diameter and specification, the liner can be constructed using either 0.70mm or 0.90mm grade 304 / 316 stainless steels. The relevant technical performance classifications and designations are:

Standard	Product Description					
	Temperature Class	Pressure Class	Condense Resistance	Corrosion Class	Material Specification Liner Grade + Thickness	Soot Fire Resistance
BS EN 1856-1	T600	H1	D	Vm	L20070	G(50)
				V2	L50070	
				Vm	L20090	
				V2	L50090	

Standard	Product Description					
	Temperature Class	Pressure Class	Condense Resistance	Corrosion Class	Material Specification Liner Grade + Thickness	Soot Fire Resistance
BS EN 1856-1	T200	H1	W	Vm	L20070	O(50)
				V2	L50070	
				Vm	L20090	
				V2	L50090	

Product Technical Information According To BS EN 1856-1 Par.7 and Annex ZA.1

Essential Characteristics Requirements According To BS EN 1856-1	Levels and/or classes: Informative Data	Document	Additional Information
Internal diameters Par.4.b	Available in diameters of 150mm-1200mm	Manufacturer's declared	Product catalogue Factory Production Control (Continuous Surveillance)
Liner Material Par. 4 .a and Par. 6.7.2	304 (1.4301 X5CrNi 18-10) 0.7mm + 0.9mm 316 (1.4404 X2CrNiMo 17-12-2)0.7mm+0.9mm	Manufacturer's declared	Product catalogue Factory Production Control (Continuous Surveillance)
Wind Load Resistance Par. 7.2 .d and Par. 6.2.3.2	Limitations of height location of exposed section of the chimney shall be 2.5 meters Maximum distance between lateral supports shall be 3.0 meters. Complied with the applied load of 312Kg on 200 Ø sections and fittings.	Manufacturer's declared Test report 19404/1/2	Annex A + Typical Installation

Compressive strength Par.7.2.e and Par.6.2.1			
Chimney sections and fittings Par.6.2.1.1 Chimney support Par.6.2.1.2	Chimney sections, fittings and Supports shall withstand an intensity of load of at least 3 x the declared design load, as per EN 1859 (Designated by the distance between supports)	Test report 19404/1 + test report AL3484	Annex A + Typical Installation
Tensile strength Par.6.2.2	Chimney shall withstand a load of at least 1.5 x manufacturer's declared, as per EH 1859	Test report 19404/1	
Lateral strength Par.6.2.3	Non-vertical installation. Maximum distance unsupported at 45° of 1.5 meters Vertical installation. Maximum spacing of lateral supports of 3.0 meters	Manufacturer's declared	Annex A + Typical Installation
Distance to combustibles, temperature related Par.7.2.f and Par.6.6.1	T600: 300mm T450:50mm T200:50mm	Test report 19404/1	
Flow resistance Par.7.2.g and Par.6.6.7	Mean value of roughness as per EN 13384-1:2002 Table B.4. 0.001mm	Manufacturer's declared Test report 19404/1	
Thermal resistance Par.7.2.h and Par.6.6.3	14.51 M^2k/Kw at T200°C	Test report 19404/1	
Thermal performance Par.6.61	Performance tests for designations	Test report 19404/1	Appendix A tests 4, 5, 6, 9, 10, and 11
Accidental human contact Par.6.6.2	Provide protective shield and/or place warning signs in access areas	Test report 19404/1	Appendix A tests 1, 2, 3, and 8
Gas tightness Par.6.5 and Table 1	The leakage rate for gas tightness 0.00064 $l/s/m^2$. Designation (H1)	Test report 19404/1	Factory Production Control (Continuous Surveillance)
Sootfire resistance Par.6.4	G(50):Yes Applies O(50):No	Test report 19404/1	
Water vapour diffusion resistance Par.6.6.4	D(Dry) T450 +T600 W(Wet)T200	Test report 19404/1/2	
Durability against corrosion Par.6.7	Stainless steel 304 (1.4301) or 316 (1.4404) 0.7mm and 0.9mm grades	Manufacturer's declared	Product catalogue

Fixing of Chimney Identification Plate

In accordance to BS EN 1856-1: 2009, chimney identification plates retaining information related to product specifications and designations are to be permanently secured to a chimney system and/or in close proximity to it in an un-obstructive but visible location. Suitable fixing positions would be either to/or near any Clean Out Doors, Draught Stabilisers, Manual Dampers or boiler connection components. It is also extremely important that this plate is not removed or defaced at any point. If the chimney plate is lost stolen off the system, then contact Flue System manufacturer for a replacement plate that must be fitted onto the system.

(j) <u>Heating Distribution System:</u>

Reconnect each existing two pipe mild steel heating services pipework systems to mains/risers within boiler room and issue report on completion of all works including recommission/balancing existing CT & VT circuits.

Also, report on any upgrade required to radiant panels/controls and/or radiators plus existing fan convectors (allow for at least two to be upgraded with new fan speed tamperproof stats with summer winter/fan speed controls on point for point basis as appropriate – contractor to survey and confirm quantities but for the purposes of **tender allow maximum of two at this stage to upgrade existing fan**

convectors plus replacement of twelve radiators (one of which LST and all new radiators must at least match existing heating outputs) including all associated alterations for new valves TRV/DRV with tamper proof limited turn down Herzcules or equivalent public service model TRV&DRV valve sets on F&R valve bodies suitable for manufacturers tool to service or swap without draining down if ever required.

(k) General:

The tenderer is to ensure that each circuit is capable of independent isolation (this may not be possible in all cases) and where this is not already provided new valves to be supplied and installed on main branches within boiler room(s).

Isolation valves should ideally, where possible be located at high level/point of entry.

On initial survey the tenderer is to check all dimensions and access for new plant to ensure that the new equipment and materials proposed will be satisfactory.

Test all heating and hot water circuits/outlets on completion, make good walls and surfaces including paintwork to match existing finishes.

On Initial completion:

Attention is drawn to the boiler manufacturer's recommendations concerning the flushing out of all pre-operational contaminants from the system with the boiler temporarily isolated. When the system has been flushed through and totally clear, a heat test shall then be carried out on the system and associated controls.

The tenderer shall allow for a suitable water treatment programme to be introduced into the heating system but only after the system has been thoroughly flushed through and satisfactory heat test carried out.

The water treatment is to be in strict accordance with the boiler manufacturer's instructions and recommendations.

Contact boiler manufacturer in the first instance to check on any particular aspect of water treatment or recommended water treatment companies such as :-
Fernox Manufacturing Co Ltd – Tel 0017 9955 0811, or,
Betz Dearborn (Sentinel) – Tel 0151 495 1861
Or equivalent

Attention is drawn to the variety of mixed metals which will be found in the heating system and accordingly this aspect should be discussed with one or both of the above-mentioned manufacturing companies.

The tenderer is to ensure that the system is adequately labelled within the boiler room stating:-

The heating system contains water treatment/inhibitor within it, and is not to be drained down unless at the request of the consultant.

The product used is Fernox MB1 (as example).
The amount required for the system is 50 litres (as example).
The product was installed on 15/03/2020 (as example).

All the above information is to be in **bold** print on the label.
The label itself is to be fully encapsulated, and left attached to the low loss header or if a more suitable place can be agreed on.

A copy of the above information is also to be kept in the O&M manual.

On Final Completion:

The tenderer shall allow for ringing and numbering all valves within the boiler room. Cable ties are not to be used.

The valves duty of operation and number information is to be clearly shown on a valve chart which is to be hung and displayed in the boiler room after being encapsulated and framed.

IMPORTANT NOTE :

1. The tenderer is to check the asbestos register before commencing any survey or works, paying particular attention to the boiler flue/terminals, boiler room ceiling and associated areas were works will take place, if there is any doubt about asbestos or you come across asbestos during the works which are not listed, you must stop work immediately and report the problem to the CA/Consultant. APEC/Oracle or equal and approved 'licensed asbestos contractor' should be in attendance as indicated to deal with any suspect materials when dismantling boiler and flues.

G) Additional Requirements

(a) Water Treatment:

Refer to additional clause and Section 9 of Part II of the main specification for all Alpha Fry Technology UK Fernox or equivalent water treatment and cleansing materials to be supplied and installed by the Services Contractor. Allow for

testing/reporting prior to draining, flushing and refilling with clean water at least 2 times and until clear before installing a total of up to approx **100 litres of MB1** (or 4% concentration) in the completed installation(s).

(b) Boiler Room ventilation and combustion air:

The existing grillage/louvres are to be cleaned or upgraded as previously specified (not less than 15mm wide spacing) for high level ventilation and low level air supply to the boiler rooms for combustion and ventilation to outside air but the Contractor is to allow for cleaning all dirt and dust from airways, shafts, windows/openings and louvres. Any additional new low-level louvres required must be approved.

(c) Associated Control panel and automatic control equipment:

Further to Clause F above - Alterations and extensions to control systems and associated field wiring to be carried out by a single, independent BMS Controls Specialist contractor who shall have all the in-house facilities to complete the new control system design and manufacture custom built site specific control panel with BMS controllers and touch-screen display, BMS software design/engineering to suit the site specific equipment and particular specification and full commissioning requirements, with off-site BMS monitoring facilities and out-of-hours response if required by the client in the future or for the maintenance of installed BMS / control systems which must be included for the first 12 months (quotation to be provided upon completion and handover of O&M manuals for annual PPM thereafter).

Specialist control system contractors to be employed as part of the mechanical contract must be able to provide all the above. If not able to provide any of these services, sub-contractors or separate suppliers shall not be considered.

The BMS contractor's office should be based within a 1-hour response time or 30-mile radius of the site to keep the environmental impact of project delivery to a minimum and promote speedy site response during the contracted work and for the 12-month defect liability period.

The specialist contractor must be an accredited partner of the BMS manufacturer being proposed and as such, must be able to demonstrate to the manufacturer that they satisfy qualification criteria and undergo regular formal audits to ensure their activities continue to meet the manufacturer's required standards.

The successful tender will be expected to confirm the specialist controls contractor at time of tender and before any orders are placed, subject to agreement to contract programme.

The associated electrical installation in connection with BMS / control systems must be compliant with the GGA master specification for workmanship and standards that will apply to this particular project.

This requirement excludes upgrades to general lighting and power or contactors on supplies but they can be approached for additional quote for this if required by tenderers as all costs must be included by the Principal Mechanical Contractor responsible for appointing Control System specialist. AES Ltd or equal and approved equivalent to be confirmed at time of tender, for complete manufacture and supply of all associated controls as indicated (points list/take off below) which excludes upgrades to general lighting and power or contactors on supplies to 3 phase standby immersion heaters but they can be approached for additional quote for this if required by tenderers as all costs must be included. The Principal Mechanical Contractor is to appoint electrician and Control System Specialist to be approved installer at time of tender for all associated controls as indicated (points list/take off below).

Project: Lodge Park Sports Centre, Corby			**Panel Type:** Single section BMS enclosure (reusing existing panel for power section)					**Date: 14/02/19**	**Quote No:** ENQ3461Q2	
Qty	**Controls Description**	**Plant** All plantomated below 4kW unless otherwise detailed	**Panel Equipment**	**Points** AI	DI	AO	DO	**Comments**	**Installation** PR	R
Control Panel Reference/Equipment Location: BMS Control Panel / 1st Floor Plant Room										
Disconnect and strip out wiring to: **2 – Electro-thermal links above old heating boilers** **Boiler sequence panel, flow switch, immersion sensor and 6 – boiler modules** **Pair boiler circulating pumps** **Pair CT heating pumps** **Pair VT pumps** **VT valve actuator** **VT flow sensor** **2 – Gas Fired Water Heaters**										
								Notes: Items shown in **bold** new / replaced otherwise, existing - indicates reuse of existing wiring installation		
1	**Room temp. sensor**			**1**				**VT Circuit Room Sensor**	**-**	
1	**Room temp. sensor**			**1**				**AHU 1 Room Sensor 1**	**-**	
1	**Room temp. sensor**			**1**				**AHU 1 Room Sensor 2**	**-**	
1	**Duct temp. sensor**			**1**				**AHU 2 Duct sensor**	**-**	
1	**Outside Temp. Sensor**			**1**						
1	**40 mm, 3-port valve & 0-10 V Actuator**					**1**		**AHU 1 heater battery valve**	**-**	
1	**40 mm, 3-port valve & 0-10 V Actuator**					**1**		**AHU 2 heater battery valve**	**-**	
3	**Electro-thermal links**				**1**			**Above new boilers. Safety circuit BMS monitored**	**3**	
3		**Boilers**	**3 x 1FSLLM**		**3**	**3**	**3**		**3**	
3		**Boiler Circulation Pumps**						**wired directly from associated boiler**	**3**	

Project: Lodge Park Sports Centre, Corby	**Panel Type:** Single section BMS enclosure (reusing existing panel for power section)	**Date: 14/02/19**	**Quote No:** ENQ3461Q2

Qty	Controls Description	Plant All plantomated below 4kW unless otherwise detailed	Panel Equipment	Points				Comments	Installation	
				AI	DI	AO	DO		PR	R
1	**Immersion sensor & pocket**			1				**Common boiler flow**	1	
1	**Immersion sensor & pocket**			1				**Common boiler return**	1	
2		**CT Heating Pumps**	**2 x 1FSLLM**		2		2	**New Magna 1D**	2	
2		**VT Heating Pumps**	**2 x 1FSLLM**		2		2	**New Magna 1D**	2	
1	**40 mm, 3-port valve & 0-10 V Actuator**					1		**VT circuit**	1	
1	**Immersion sensor & pocket**			1				**VT Valve control**	1	
2	**25 mm, 3-port valve & actuator**								2	
								NO ALLOWANCE INC. FOR IMMERSION HEATERS (6kW). ASSUME ELECTRICAL SUPPLIES AND NECESSARY CONTACTORS PROVIDED / INSTALLED BY OTHERS (EC)		
1		DHWS Circulation Pump	existing		1		1	trip / enable (wiring in case of repositioning / relocation)	1	
2	**Immersion sensor & pocket**			2				**2 x DHWS monitor**	2	
1		Magnetic Water De-scaler	Existing		1			On signal	-	

Project: Lodge Park Sports Centre, Corby	**Panel Type:** Single section BMS enclosure (reusing existing panel for power section)	**Date: 14/02/19**	**Quote No:** ENQ3461Q2

Qty	Controls Description	Plant All plantomated below 4kW unless otherwise detailed	Panel Equipment	Points				Comments	Installation	
				AI	DI	AO	DO		PR	R
	Solar DHWS Pre-Heat (OPTION)									
1		**Solar Controller Supply**	**1FM**		**1**			**Alarm signal (VFC) via AM1 Alarm Module**	**1**	
1								**Grundfos Flow Sensor (to Solar Controller)**	**1**	
1								**Vessel sensor (to SC)**	**1**	
1								**Collector Sensor (on roof to SC)**		1
1		**Thermostat / Valve Supply**	**1FM**					**High Limit Thermostat (to SC)**	**1**	
1								**Solar two-port valve (to SC)**	**1**	
1								**Solar Pump (to SC)**	**1**	
1								**Solar Pasturisation Pump (to SC)**	**1**	
1								**Heat Meter (to SC)**	**1**	
1					**1**			**Heat Meter (to control panel)**	**1**	
1								**Flow temp. sensor (to Heat Meter)**	**1**	
1								**Return temp. sensor (to HM)**	**1**	
1								**Volume flow sensor (to HM)**	**1**	
1		AHU 1 Supply Fan	Existing		**1**		**1**	Trip / enable	-	
1		AHU 1 Extract Fan	Existing		**1**		**1**	Trip / enable	-	
1	**Duct thermostat**				**1**				**-**	
1		AHU 2 Supply Fan	Existing		**1**		**1**	Trip / enable	-	
1		AHU 2 Extract Fan	Existing		**1**		**1**	Trip / enable	-	

Project: Lodge Park Sports Centre, Corby	**Panel Type:** Single section BMS enclosure (reusing existing panel for power section)	**Date: 14/02/19**	**Quote No: ENQ3461Q2**

Qty	Controls Description	Plant All plantomated below 4kW unless otherwise detailed	Panel Equipment	Points				Comments	Installation	
				AI	DI	AO	DO		PR	R
1	**Duct thermostat**				1				-	
1		Electric Door Heater EDC1	Existing				1	Enable	-	
1		Electric Door Heater EDC1	Existing						-	
1		Plant Room Vent Fan	Existing **+ add control switch and indicators**		1		1	Air flow prove (current sw.) / enable	-	
2	**Room thermostats**							**One for each sports hall. Disconnect wiring to one of the existing 'stats and join wiring in each hall.**		**2**
4	**25 mm, 3-port motorised valves (separately priced)**							**To replace existing if required**		
1								**Relocate existing gas sensor (to fit BMS enclosure to existing panel)**	**1**	
1								**Relocate existing double socket outlet (to fit BMS enclosure to existing panel)**	**1**	
1	**BMS Controller & I/O modules**									
1	**BMS Touchscreen / HMI**									

(d) Fire Stopping:

Supply and install 'Promaseal' range of proprietary fire-resistant penetration seals or equivalent around each service or group of pipe/duct or cable, which pass through a fire compartment wall, floor or ceiling/roof. Use Promaseal fire compound for large holes or Promaseal Silicone Sealant for smaller holes.

These seals must be applied in strict accordance with manufacturers recommendations, all as supplied by Messrs Promat UK Ltd, or equal and approved equivalent at time of tender.

(e) Drainage suitable temperature rated uPVC as required:

All overflows, condense, traps, as boiler manufacturers installation instructions, safety valve discharges via Tundish's to common low-level perimeter header and terminate at a safe position close to floor level, above existing or new floor gulley.

(f) Pipework Systems:

(i) Dosing Pots

Xpot or equivalent required as indicated above to be supplied complete with spare filters for changing monthly and after 3 months, then 6 months intervals thereafter as part of this contract until the end of the defects liability period.

(ii) Test Plugs for Commissioning Valves

As supplied by Messrs IHL (Walraven Group) or equivalent for example, type Twinlok ¼ BSP or equal and approved.
In addition, Twinlok test plugs to be fitted both sides of all circulating pumps with separate tee fitting suited for pumps with binder point for testing system differential pressure.

H) Specification for Painting and Finishes

The Mechanical Contractor is to allow for all cleaning down and for providing and installing subsequent new paint/stain finishes or equivalent to the following schedule as an example of material standard required:-

(a) Walls

Manufacturer :	ICI Paints – Dulux Trade Classic Colours
Primer :	One Coat Dulux Alkali resistant primer
Colour :	White
Finish :	2 Coats Dulux Trade quick drying eggshell
Colour :	White

NOTE : Existing walls to be rubbed down and thoroughly cleaned prior to new paint application.

Louvres and Doors

Clean down retreat timber work/frames (except where not appropriate/uPVC).

(b) Ceilings

Not Applicable.

(c) Floors

Manufacturer :	Flowcrete Industrial Flooring Ltd – Flowcoat SF41
Finish :	2 Coat 2 pack epoxy resin coating with anti-slip finish – 1st coat followed by fine sand spread before applying final coat
Colour :	Goosewing Grey 222
NOTE :	Refer to manufacturers data sheets which must be adhered to for application.

I) Electrical Services

The following electrical mains and upgrade works on main panel will be carried out by qualified electrician or equal controls specialist to be confirmed at tender stage but allow for new MEM electrical distribution board or equivalent to serve associated new lighting and power supplies for heating boiler plant room only and timely orders will need to be placed by the successful Mechanical Contractor who will be responsible for co-ordination and liaison. Existing main electrical distribution equipment and all other existing equipment must remain fully intact and operational at all times.

The contractor will be responsible for :-

- Strip out and removal of redundant main electrical and associated trunking within the old plant room.
- If required and existing faulty then, new LED enclosed linear 1500 long luminaires, lighting circuits and remove redundant lighting and associated wiring etc (See subsequent item i) Lighting).
- New emergency luminaire (may be integral as part of LED luminaire) fed from local lighting circuit.

All works will be carried out during normal working hours Monday – Friday and with continuous work being available around Sports Centre activities.

(i) Lighting

The boiler house existing lighting services wiring is to be reused unless needing rewiring with new low smoke single core cables enclosed in galvanised conduit altered to suit new layout/Led luminaires specified. The Mechanical Contractor and his electrician must allow for testing and verifying circuits and if required to supply and install the following new luminaires for installation. Alternative quotes with technical submissions will be required from the Contractor and preferably for consideration at tender stage, for example:-

Luminaires : General – 3 No main block Luceco 'Climate' LCL12W22E40 or equivalent LED (one with integral emergency pack) totally enclosed IP65 linear luminaires 1240mm (Min) long. The emergency pack to be wired on a permanent supply with key operated test switch adjacent to the general light switch at the entrance door labelled 'emergency light test'.

In addition, the existing luminaires in the boiler house are to be removed but the circuit protective device in the local distribution board replaced/upgraded as

appropriate for the new D/Board required for clear demarcation and testing purposes.

Switches : MK Metalclad 1 gang DP switch and adjacent 1 way secret key switch for emergency lighting test.

These will be wired as separate circuit from the new distribution board using 1.5mm sq LSF cables enclosed in galvanised conduit or MICV cables all surface fixed.

(ii) Small Power

Existing boiler room L&P circuits. 2 No MK Metalclad or equivalent surface mounted twin 13 amp SSO wired as a separate 20 amp radial circuit protected by a combined RCD/MCB in the distribution board with 2.5mm sq LSF single core cables enclosed in galvanised conduit all surface fixed. **In Addition** supply and install new power and control wiring as appropriate for replacement fans in Sports Hall plus 3 phase contactor controlled back up power supplies as part of mechanical works for each of the new HWS cylinders - refer to details appended for example.

(iii) Additional Main Earth Bonding

Additional main bonding between the main electrical supply earth terminal and separate protective equipotential bonding to the incoming water and gas supplies to be supplied and installed using appropriately sized insulated green yellow LSF cables.

(iv) Automatic Controls

Upgrade existing automatic control panel to be carried out by Messrs AES Control Systems or equivalent specialist approved at tender stage to include all associated controls and electrical wiring to new plant, equipment and remote controls as part of the Mechanical Services Contract. All temporary wiring provisions that need to be allowed for in the Services Contractors tender must be included. New relay required on existing fire alarm system to shut down system and gas supply. Fire alarm interface by the clients specialist.

J) **Schedule of PC and Provisional Sums (see following breakdown)**

In addition to the foregoing which the Contractor must allow for in his tender the Services Contractor is also to allow the following :-

1. For possible additional BWIC with Services and roof terminals.
Allow a Provisional Sum of £ 750.00

2. For possible additional work associated with existing electrical and Fire Alarm System interfaces.
Allow a Provisional Sum of £ 1750.00

3. For contingency required for this section of upgrade works or for spares.
Allow a Provisional Sum of £ 1500.00
TOTAL **£ 4000.00**

K) Key dates and times for LODGE PARK SPORTS CENTRE

Winter 2020 - LPSC Open seven days per week
Centre opens at 6am and closes at 10:30pm
Shared access via receptions lobby with Gym members 6-8:30am
(all deliveries by prior arrangement to be received and signed for by contractor, preferably before 8:30am)

Normal activities from 8:30 and spray tan area from 9am.
General access to be agreed by arrangement.
Creche open from 9am until midday on Monday, Wednesday and Friday's**.**

L) The following requirements will need to be met if successful:

- **Risk Assessments and Method Statements** will be required before the successful contractor can commence any works.
- **Safeguarding:** All contracted staff (including sub-contractors and volunteers) working within the building will be required to hold a current enhanced DBS Certificate. The Client will require a letter of confirmation from the successful bidder which includes list of employee names and DBS reference numbers, date DBS certificate issued and to allow the Client to conduct its legal safeguarding duties, as appropriate.
- **Asbestos:** Certain areas or items within buildings built prior to the year 2000 may contain Asbestos. These include insulation (board and lagging), shafts, gaskets, floor and ceiling tiles etc. The successful bidder must read latest management survey for the site and sign the Asbestos Log Book held on site before they carry out any work that may disturb the fabric of the building or the services installed in it.

All Tenderers to allow for the complete supply and installation, testing, commissioning and setting to work, as indicated and specified. Please complete fully the separate breakdowns for the three options to be offered to the client (refer to spreadsheet in tender pack, as illustrated below).

	LODGE PARK SPORTS CENTRE BOILER & FAN REPLACEMENT	668 – LPSC – AOT
OPTION 1	**BREAKDOWN OF WORKS**	(sheet 1 of 3)
	Inspections, Reports, Removal and Temporary Works	£
1.1	For the contract inspection and reports, removal of all obsolete services and temporary provisions including lockable skips (if required).	
1.2	**New Main Plant**	
1.2.1	New LPHW gas fired boiler plant and HWS cylinders (& HWS pump) as specified including two new boilers, two new HWS cylinders, flue systems and terminal, plus new invertor pump sets for each circuit and new sealed system F&E.	
1.3	**New Piped Services**	
1.3.1	Extending existing gas supplies with new pipework to serve new boilers including utilising existing safety shut-off valve:	
1.3.2	Modify existing LPHW mains, headers and distributing pipework within boiler houses including new Spirocross low loss air/dirt separators, new X-Pot c/w auto-controls and connections to existing distribution system retained/reused with new additional F&R pipework circuits on existing VT and CT mains within boiler room.	
1.3.3	Essential temporaries and modifications to existing heating and electrical services to facilitate new boiler plant & convectors/radiators plus new separate fully insulated concealed F&R pipework circuit to Crèche	
1.4	**New Thermal Insulation**	
	All Pipework Services: **FOR PLANT ROOMS** and new F&R pipework to Crèche	
1.5	**Electrical Services**	
1.5.1	Lighting Installation – alterations.	
1.5.2	Small Power Installation – alterations.	
1.5.3	Earth Bonding – Upgrades.	
1.5.4	Upgrade controls/supplies to two HWS immersion heaters (3-phase each with contactors)	
1.6	**H&V Control Panel Installations**	
	Supply of upgraded BMS controller, controls, wiring and final commissioning by AES	
1.7	**BWIC Services**	
1.7.1	Extension and alterations to floor/concrete bases for plant.	
1.7.2	Cleaning and modifying associated floor gulley/drainage FOR PLANT ROOM.	
1.7.3	Making good and fire stopping around services.	
1.7.4	Flue/terminal structural remedial works and redecoration works as specified.	
1.7.5	BWIC with replacing sports hall wall terminal fan units	
1.8	**Testing and Commissioning**	
1.8.1	Existing and New Gas Services.	
1.8.2	Cleansing and final water treatment for all LPHW space heating and associated domestic pipework systems.	
1.8.3	All new boiler plant, equipment, pipework services, associated H&V control panel, controls and electrical services	
1.8.4	Ventilation system	
1.9	**Drawings and Manuals**	
1.9.1	Fully co-ordinated detailed working and associated BWIC drawings.	
1.9.2	'As Installed' drawings and details.	
1.9.3	All Operating and Maintenance Manuals.	
1.9.4	Handover procedures and practical demonstration to Sports Centre staff.	
	Sub-Total for Option 1 =	£ -
	PC and Provisional Sums	**£ 4,000.00**
	TENDER SUM for Option 1 =	

	LODGE PARK SPORTS CENTRE BOILER & FAN REPLACEMENT	668 – LPSC – AOT
OPTION 2	**BREAKDOWN OF WORKS**	(sheet 2 of 3)
	Inspections, Reports, Removal and Temporary Works	£
1.1	For the contract inspection and reports, removal of all obsolete services and temporary provisions including lockable skips (if required).	
1.2	**New Main Plant**	
1.2.1	New LPHW gas fired boiler plant and HWS cylinders (& HWS pump) as specified including two new boilers, two new HWS cylinders, flue systems and terminal, plus new invertor pump sets for each circuit and new sealed system F&E.	
1.2.3	Ten large new wall terminal fan units for sports halls to replace existing within existing wall openings as indicated and upgrade/replace existing controllers in first floor bar adjacent to HVAC split system controllers.	
1.3	**New Piped Services**	
1.3.1	Extending existing gas supplies with new pipework to serve new boilers including utilising existing safety shut-off valve:	
1.3.2	Modify existing LPHW mains, headers and distributing pipework within boiler houses including new Spirocross low loss air/dirt separators, new X-Pot c/w auto-controls and connections to existing distribution system retained/reused with new additional F&R pipework circuits on existing VT and CT mains within boiler room.	
1.3.3	Essential temporaries and modifications to existing heating and electrical services to facilitate new boiler plant & convectors/radiators plus new separate fully insulated concealed F&R pipework circuit to Crèche	
1.3.4	S&I of twelve new radiators and TRV/DRV valve sets complete with all associated pipework alterations and extension to existing systems plus two fan convector control upgrades utilising Honeywell tamper proof fan boost stats or equal and approved.	
1.3.5	Retain existing F&R pipework circuit to serve high level radiant panel heaters in each sports Hall but report on 3-port control valves and upgrade supplies with new float type AAV's at highest point and new black bulb common sensor with wire guard for each sports hall.	
1.4	**New Thermal Insulation**	
	All Pipework Services: **FOR PLANT ROOMS** and new F&R pipework to Crèche	
1.5	**Electrical Services**	
1.5.1	Lighting Installation – alterations.	
1.5.2	Small Power Installation – alterations.	
1.5.3	Earth Bonding – Upgrades.	
1.5.4	Upgrade controls/supplies to two HWS immersion heaters (3-phase each with contactors), Ten new Sports hall FANS grouped each end (4 groups in total) associated reversing controllers (two for each sports hall), upgraded FAN CONVECTOR supplies (allow two for tender purposes)	
1.6	**H&V Control Panel Installations**	
	Supply of upgraded BMS controller, controls, wiring and final commissioning by AES	
1.7	**BWIC Services**	
1.7.1	Extension and alterations to floor/concrete bases for plant.	
1.7.2	Cleaning and modifying associated floor gulley/drainage FOR PLANT ROOM.	
1.7.3	Making good and fire stopping around services.	
1.7.4	Flue/terminal structural remedial works and redecoration works as specified.	
1.7.5	BWIC with replacing sports hall wall terminal fan units	
1.8	**Testing and Commissioning**	
1.8.1	Existing and New Gas Services.	
1.8.2	Cleansing and final water treatment for all LPHW space heating and associated domestic pipework systems.	
1.8.3	All new boiler plant, equipment, pipework services, associated H&V control panel, controls and electrical services	
1.8.4	Ventilation system and new fans	
1.9	**Drawings and Manuals**	
1.9.1	Fully co-ordinated detailed working and associated BWIC drawings.	
1.9.2	'As Installed' drawings and details.	
1.9.3	All Operating and Maintenance Manuals.	
1.9.4	Handover procedures and practical demonstration to Sports Centre staff.	
	Sub-Total for Option 2 =	£ -
	PC and Provisional Sums	**£ 4,000.00**
	TENDER SUM for Option 2 =	

	LODGE PARK SPORTS CENTRE BOILER & FAN REPLACEMENT	668 – LPSC – AOT
OPTION 3	**BREAKDOWN OF WORKS**	(sheet 3 of 3)
	Inspections, Reports, Removal and Temporary Works	£
1.1	For the contract inspection and reports, removal of all obsolete services and temporary provisions including lockable skips (if required).	
1.2	**New Main Plant**	
1.2.1	New LPHW gas fired boiler plant and HWS cylinders (& HWS pump) as specified including two new boilers, two new HWS cylinders, flue systems and terminal, plus new invertor pump sets for each circuit and new sealed system F&E.	
1.2.2	Solar pre-heat buffer vessel and collector package with destrat pump/pasteurisation kit and all associated power and controls (not part included in controls quote attached)	
1.2.3	Ten large new wall terminal fan units for sports halls to replace existing within existing wall openings as indicated and upgrade/replace existing controllers in first floor bar adjacent to HVAC split system controllers.	
1.3	**New Piped Services**	
1.3.1	Extending existing gas supplies with new pipework to serve new boilers including utilising existing safety shut-off valve:	
1.3.2	Modify existing LPHW mains, headers and distributing pipework within boiler houses including new Spirocross low loss air/dirt separators, new X-Pot c/w auto-controls and connections to existing distribution system retained/reused with new additional F&R pipework circuits on existing VT and CT mains within boiler room.	
1.3.3	Essential temporaries and modifications to existing heating and electrical services to facilitate new boiler plant & convectors/radiators plus new separate fully insulated concealed F&R pipework circuit to Crèche	
1.3.4	S&I of twelve new radiators and TRV/DRV valve sets complete with all associated pipework alterations and extension to existing systems plus two fan convector control upgrades utilising Honeywell tamper proof fan boost stats or equal and approved.	
1.3.5	Retain existing F&R pipework circuit to serve high level radiant panel heaters in each sports Hall but report on 3-port control valves and upgrade supplies with new float type AAV's at highest point and new black bulb common sensor with wire guard for each sports hall.	
1.4	**New Thermal Insulation**	
	All Pipework Services: **FOR PLANT ROOMS** and new F&R pipework to Crèche	
1.5	**Electrical Services**	
1.5.1	Lighting Installation – alterations.	
1.5.2	Small Power Installation – alterations.	
1.5.3	Earth Bonding – Upgrades.	
1.5.4	Upgrade controls/supplies to two HWS immersion heaters (3-phase each with contactors), Ten new Sports hall FANS grouped each end (4 groups in total) associated reversing controllers (two for each sports hall), upgraded FAN CONVECTOR supplies (allow two for tender purposes)	
1.6	**H&V Control Panel Installations**	
	Supply of upgraded BMS controller, controls, wiring and final commissioning by AES	
1.7	**BWIC Services**	
1.7.1	Extension and alterations to floor/concrete bases for plant.	
1.7.2	Cleaning and modifying associated floor gulley/drainage FOR PLANT ROOM.	
1.7.3	Making good and fire stopping around services.	
1.7.4	Flue/terminal structural remedial works and redecoration works as specified.	
1.7.5	BWIC with replacing sports hall wall terminal fan units	
1.8	**Testing and Commissioning**	
1.8.1	Existing and New Gas Services.	
1.8.2	Cleansing and final water treatment for all LPHW space heating and associated domestic pipework systems.	
1.8.3	All new boiler plant, equipment, pipework services, associated H&V control panel, controls and electrical services	
1.8.4	Ventilation system and new fans	
1.9	**Drawings and Manuals**	
1.9.1	Fully co-ordinated detailed working and associated BWIC drawings.	
1.9.2	'As Installed' drawings and details.	
1.9.3	All Operating and Maintenance Manuals.	
1.9.4	Handover procedures and practical demonstration to Sports Centre staff.	
	Sub-Total for Option 3 =	£ -
	PC and Provisional Sums	**£ 4,000.00**
	TENDER SUM for Option 3 =	

LODGE PARK SPORTS CENTRE BOILER & FAN REPLACEMENT
WINTER 2020 WORKS

ANALYSIS OF TENDER : MECHANICAL

I/We confirm that the above tender is offered and is fully inclusive of all installation requirements in accordance with the specification and details, and inclusive of allowances for contract conditions and preliminaries and Contractors discounts.
I/We further agree that our personnel CV/registration details and detailed tender breakdown will be made available for the inspection of the Consultant and the prices contained therein will form the basis of a schedule of rates for the purposes of assessing and agreeing any cost variations which the Client, Consultants may subsequently decide upon.
I/We confirm that our tender will remain open for the period of 1 month from the return of tender for acceptance by the Client and Consultant.
I/We confirm that all operatives will have enhanced DBS (formerly CRB) certification for inspection upon arrival to site for inspection/approval by the Sports Centre at the outset of the project.
I/We confirm the day work percentage will be:-

Labour	……%
Material	……%
Plant	……%

I/We confirm the above tender is based on the following normal working hours for operatives:-

Normal working hours per week	……

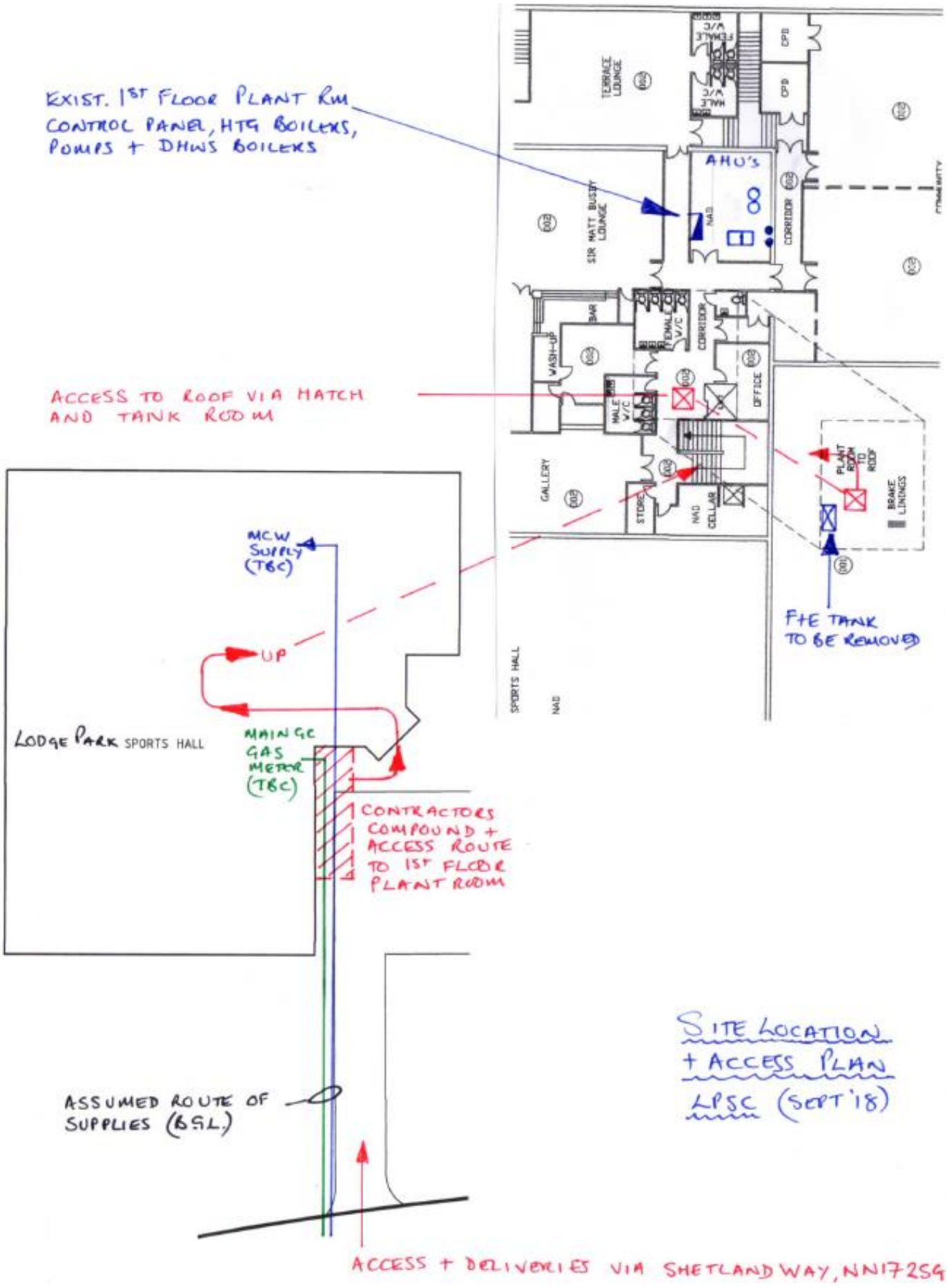
NAME OF MECHANICAL CONTRACTOR	
COMPANY ADDRESS	

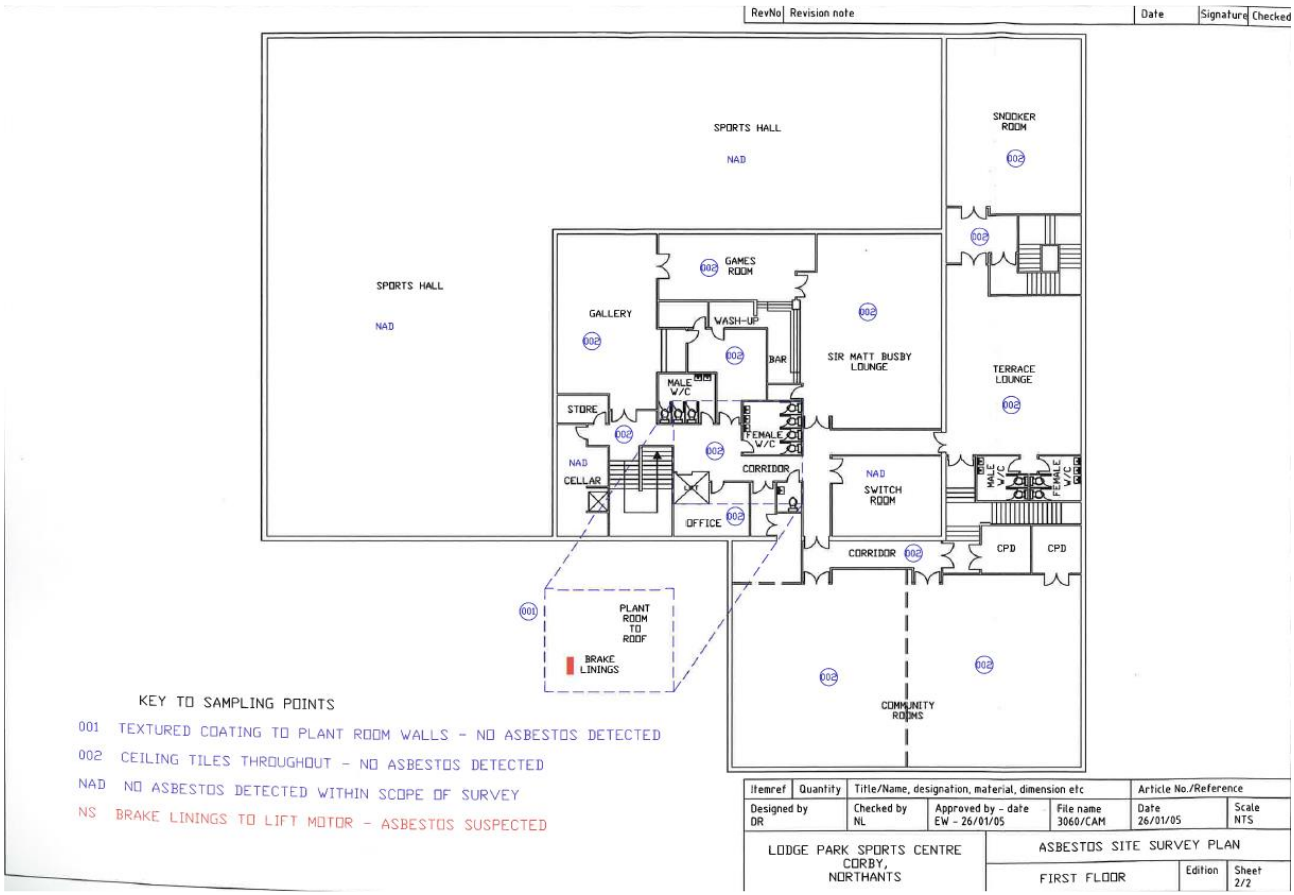
SIGNED BY:	
PRINT NAME:	
DATE:	

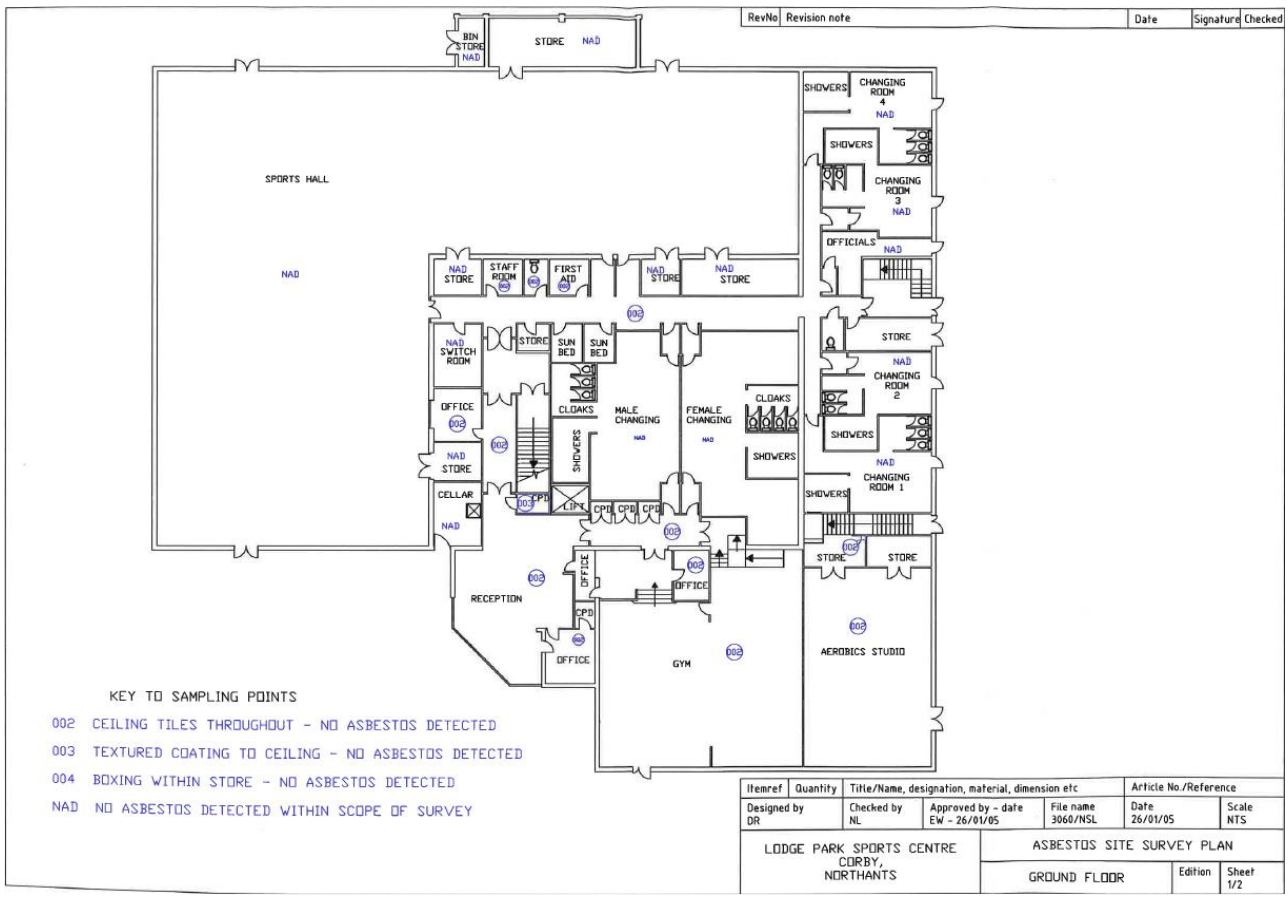
APPENDICES – GGA Spec Part III 668

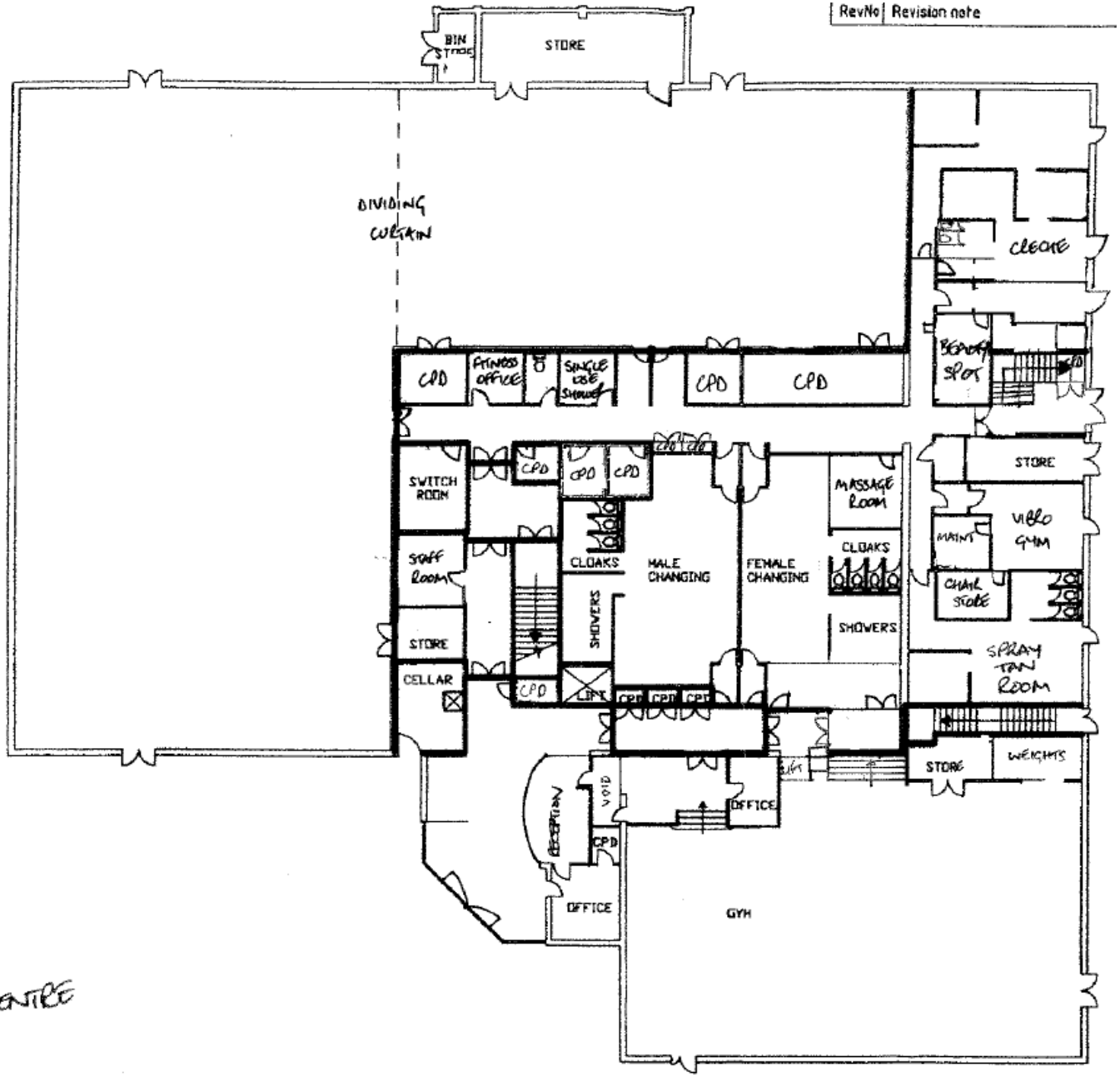
The following quotations from manufacturers will apply :-

1. Site Location/access plan, asbestos survey plan & internal layouts – page 50 - 53
2. Proposed LPHW heating upgrade and radiator/fan replacements – page 54 - 55
3. DHWS details & typical schematic – pages 56 - 60
4. Refer to latest Asbestos Management plan (Dec 2019), Fire Risk Assessment (13.12.18), Water hygiene/Legionella report (10.5.19) – full copies uploaded as separate file/download on LGA portal for information only to all Tenderers before carrying out their own any surveys and inspections.


EXIST. 1ST FLOOR PLANT RM
CONTROL PANEL, HTG BOILERS,
POMPS + DHWS BOILERS
ACCESS TO ROOF VIA HATCH
AND TANK ROOM
TERRACE LOUNGE
FEMALE W/C
MALE W/C
CPD
CPD
AHU's
SIR MATT BUSBY LOUNGE
CORRIDOR
BAR
WASH-UP
FEMALE W/C
CORRIDOR
OFFICE
MALE W/C
GALLERY
STORE
NAD
CELLAR
PLANT ROOM TO ROOF
BRAKE LININGS
SPORTS HALL
NAD
F+E TANK TO BE REMOVED
MCW SUPPLY (TBC)
UP
LODGE PARK SPORTS HALL
MAIN GC GAS METER (TBC)
CONTRACTORS COMPOUND + ACCESS ROUTE TO 1ST FLOOR PLANT ROOM
ASSUMED ROUTE OF SUPPLIES (BSL)
ACCESS + DELIVERIES VIA SHETLAND WAY, NN17 2SG
SITE LOCATION + ACCESS PLAN
LPSC (SEPT '18)

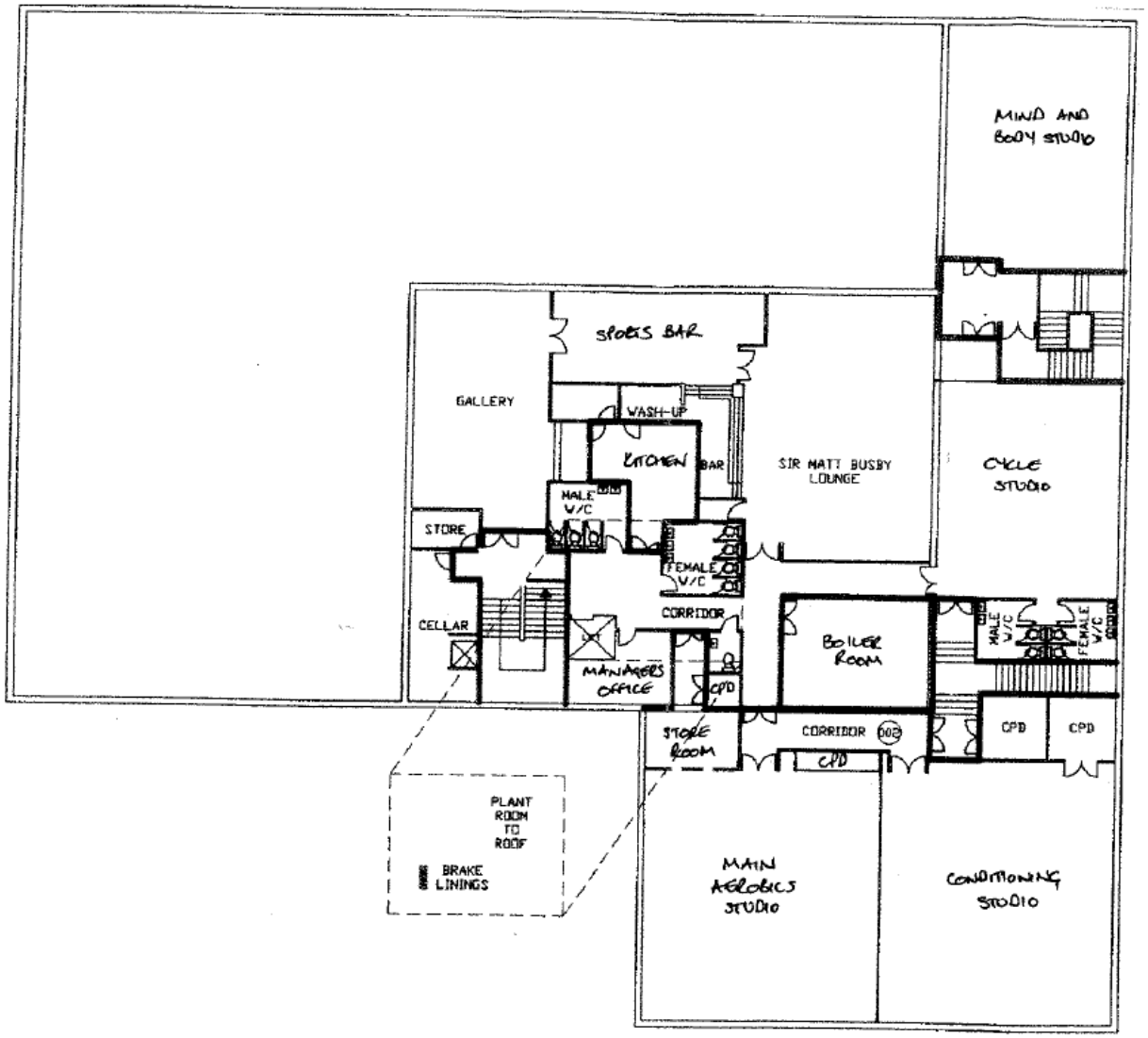

RevNo Revision note Date Signature Checked
SPORTS HALL
NAD
SNOOKER ROOM
002
GAMES ROOM
GALLERY
WASH-UP
BAR
SIR MATT BUSBY LOUNGE
TERRACE LOUNGE
MALE W/C
FEMALE W/C
STORE
CELLAR
CORRIDOR
OFFICE
SWITCH ROOM
CPD
PLANT ROOM TO ROOF
001
BRAKE LININGS
COMMUNITY ROOMS
KEY TO SAMPLING POINTS
001 TEXTURED COATING TO PLANT ROOM WALLS - NO ASBESTOS DETECTED
002 CEILING TILES THROUGHOUT - NO ASBESTOS DETECTED
NAD NO ASBESTOS DETECTED WITHIN SCOPE OF SURVEY
NS BRAKE LININGS TO LIFT MOTOR - ASBESTOS SUSPECTED
Itemref Quantity Title/Name, designation, material, dimension etc Article No./Reference
Designed by DR
Checked by NL
Approved by - date EW - 26/01/05
File name 3060/CAM
Date 26/01/05
Scale NTS
LODGE PARK SPORTS CENTRE CORBY, NORTHANTS
ASBESTOS SITE SURVEY PLAN
FIRST FLOOR
Edition
Sheet 2/2


RevNo Revision note Date Signature Checked
BIN STORE NAD
STORE NAD
SPORTS HALL
NAD
SHOWERS
CHANGING ROOM 4 NAD
SHOWERS
CHANGING ROOM 3 NAD
OFFICIALS NAD
NAD STORE
STAFF ROOM
FIRST AID
NAD STORE
NAD STORE
STORE
NAD SWITCH ROOM
SUN BED
SUN BED
CLOAKS
MALE CHANGING
FEMALE CHANGING
CLOAKS
SHOWERS
SHOWERS
CHANGING ROOM 2 NAD
OFFICE
NAD STORE
CELLAR NAD
CPD
LIFT
CPD
CPD
CPD
SHOWERS
CHANGING ROOM 1 NAD
STORE
STORE
RECEPTION
OFFICE
OFFICE
OFFICE
GYM
AEROBICS STUDIO
KEY TO SAMPLING POINTS
002 CEILING TILES THROUGHOUT - NO ASBESTOS DETECTED
003 TEXTURED COATING TO CEILING - NO ASBESTOS DETECTED
004 BOXING WITHIN STORE - NO ASBESTOS DETECTED
NAD NO ASBESTOS DETECTED WITHIN SCOPE OF SURVEY
Itemref Quantity Title/Name, designation, material, dimension etc Article No./Reference
Designed by DR
Checked by NL
Approved by - date EW - 26/01/05
File name 3060/NSL
Date 26/01/05
Scale NTS
LODGE PARK SPORTS CENTRE CORBY, NORTHANTS
ASBESTOS SITE SURVEY PLAN
GROUND FLOOR
Edition
Sheet 1/2

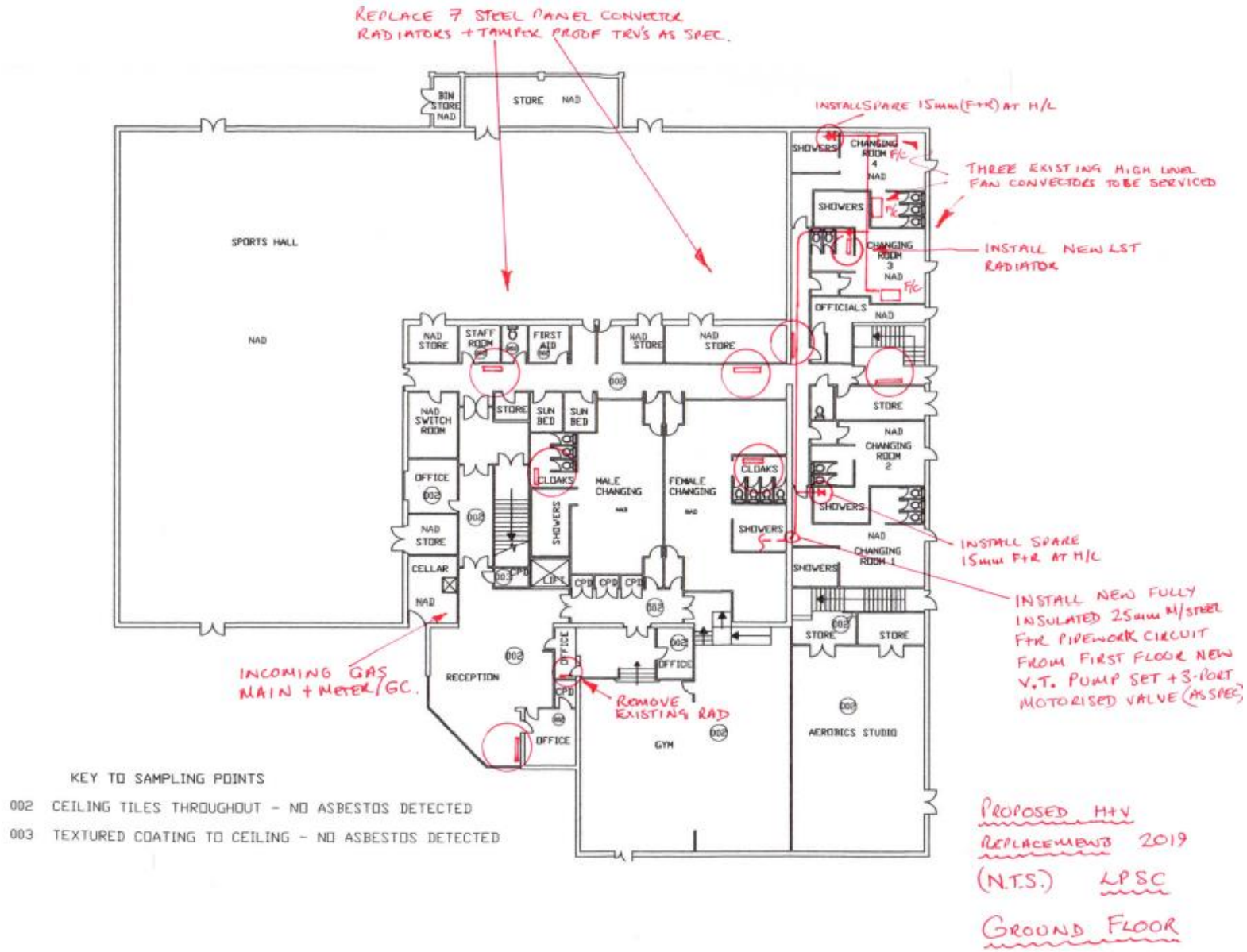


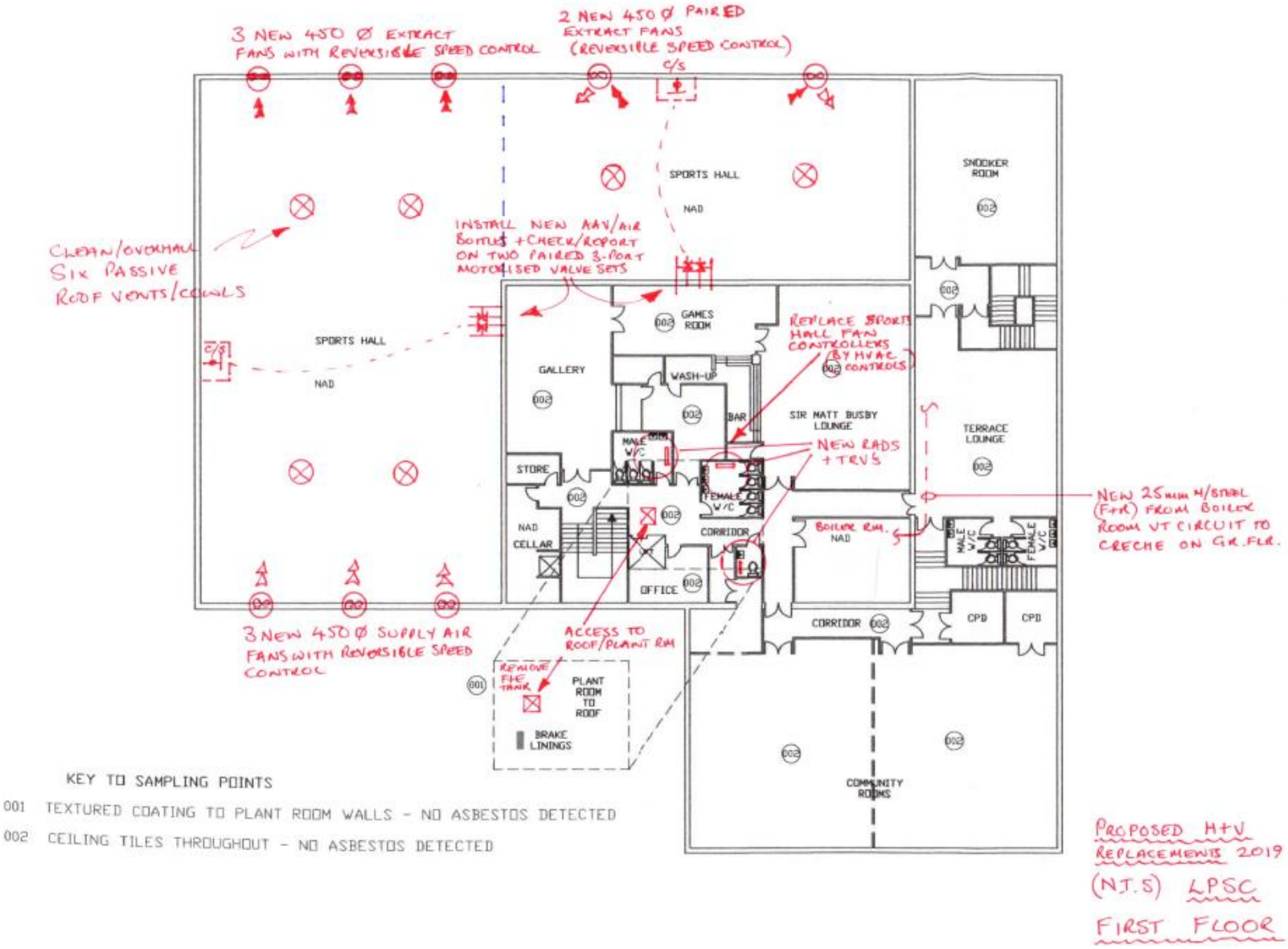
LODGE PARK SPORTS CENTRE

GROUND FLOOR



LODGE PARK SPORTS CENTRE
FIRST FLOOR

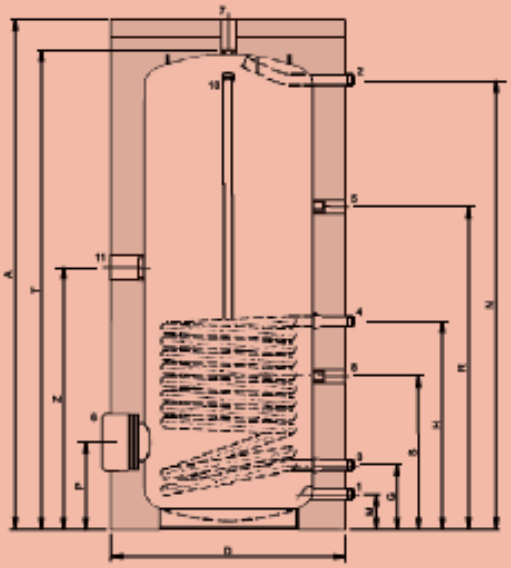

REPLACE 7 STEEL PANEL CONVECTOR RADIATORS + TAMPER PROOF TRV'S AS SPEC.
INSTALL SPARE 15mm (F+R) AT H/L
THREE EXISTING HIGH LEVEL FAN CONVECTORS TO BE SERVICED
INSTALL NEW LST RADIATOR
INSTALL SPARE 15mm F+R AT H/L
INSTALL NEW FULLY INSULATED 25mm M/STEEL F+R PIPEWORK CIRCUIT FROM FIRST FLOOR NEW V.T. PUMP SET + 3-PORT MOTORISED VALVE (AS SPEC)
INCOMING GAS MAIN + METER/GC.
REMOVE EXISTING RAD
BIN STORE NAD
STORE NAD
SPORTS HALL
NAD
SHOWERS
CHANGING ROOM 4 NAD
SHOWERS
CHANGING ROOM 3 NAD
OFFICIALS NAD
NAD STORE
STAFF ROOM
FIRST AID
NAD STORE
NAD STORE
STORE
NAD CHANGING ROOM 2
NAD SWITCH ROOM
STORE
SUN BED
SUN BED
CLOAKS
MALE CHANGING
FEMALE CHANGING
CLOAKS
OFFICE
SHOWERS
SHOWERS
SHOWERS
NAD CHANGING ROOM 1
NAD STORE
CELLAR
NAD
SHOWERS
STORE
STORE
RECEPTION
OFFICE
OFFICE
OFFICE
GYM
AEROBICS STUDIO
KEY TO SAMPLING POINTS
002 CEILING TILES THROUGHOUT - NO ASBESTOS DETECTED
003 TEXTURED COATING TO CEILING - NO ASBESTOS DETECTED
PROPOSED H+V REPLACEMENTS 2019
(N.T.S.) LPSC
GROUND FLOOR


3 NEW 450 Ø EXTRACT FANS WITH REVERSIBLE SPEED CONTROL
2 NEW 450 Ø PAIRED EXTRACT FANS (REVERSIBLE SPEED CONTROL)
C/S
SPORTS HALL
NAD
SNOOKER ROOM
002
CLEAN/OVERHAUL SIX PASSIVE ROOF VENTS/COWLS
INSTALL NEW AAV/AIR BOTTLE + CHECK/REPORT ON TWO PAIRED 3-PORT MOTORISED VALVE SETS
SPORTS HALL
NAD
GAMES ROOM
GALLERY
WASH-UP
BAR
REPLACE SPORTS HALL FAN CONTROLLERS BY HVAC CONTROLS
SIR MATT BUSBY LOUNGE
TERRACE LOUNGE
NEW RADS + TRVS
MALE W/C
FEMALE W/C
STORE
NEW 25mm M/STEEL (F+R) FROM BOILER ROOM VT CIRCUIT TO CRECHE ON GR. FLR.
NAD CELLAR
CORRIDOR
BOILER RM. NAD
OFFICE
CPD
CPD
CORRIDOR
3 NEW 450 Ø SUPPLY AIR FANS WITH REVERSIBLE SPEED CONTROL
ACCESS TO ROOF/PLANT RM
REMOVE FHE TANK
001
PLANT ROOM TO ROOF
BRAKE LININGS
COMMUNITY ROOMS
KEY TO SAMPLING POINTS
001 TEXTURED COATING TO PLANT ROOM WALLS - NO ASBESTOS DETECTED
002 CEILING TILES THROUGHOUT - NO ASBESTOS DETECTED
PROPOSED H+V REPLACEMENTS 2019
(N.T.S) LPSC
FIRST FLOOR

Dimensional Drawings & Connection Details

Legend	Description	Unit	SIVS66GE
A	Total height	mm	1650
D	Diameter (without insulation)	mm	550
	Diameter (with insulation)	mm	750
G	Coil Outlet	mm	205
H	Coil Inlet	mm	675
M	Cold Water Inlet	mm	110
N	Hot Water Outlet	mm	1460
P	Clean Out Opening	mm	280
R	Building Return	mm	1050
S	Sensor Connection	mm	495
T	T&P connection	mm	1545
Z	1½ " Immersion Heater Opening	mm	850

Legend	Description	Unit	SIVS66GE
1	Drain/Coild Water Inlet	-	G 1"
2	Hot Water Outlet	-	G 1"
3	Coil Outlet	-	G 1"
4	Coil Inlet	-	G 1"
5	Building Return	-	Rp ¾
6	Clean Out Opening Diameter	mm	110
7	T&P connection	-	Rp 1"
8	Sensor Connection	-	Rp ¾
10	Magnesium Anode	-	G 1¼"
11	1½ " Immersion Heater Opening	-	G 1½"



SIVS66GE

Technical Specification

Indirect Storage Vessel Model		SIVS66GE	SIVS100GE	SIVS110GE	SIVS130GE	SIVS165GE	SIVS220GE	SIVS330GE	SIVS440GE	SIVS550GE	SIVS660GE
Storage Capacity	litres	300	390	480	650	730	1020	1580	1830	2600	2850
Efficiency Data - Building Regulations											
Heat Loss	Kw/24 hr	1.20	1.56	1.92	1.95	2.19	2.04	4.74	7.32	7.80	8.55
Efficiency Data - ErP											
Ecodesign Energy Label rating		C	C	C	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Standing Loss	W	92	100	104	126	126	146	154	171	232	243
General Data											
Dimensions (Height)	mm	1650	1710	2045	1840	2035	2005	1985	2175	2045	2070
Dimensions (Width with insulation)	mm	750	740	760	910	930	1100	1300	1300	1600	1600
Weight (Empty)	kg	117	139	180	241	254	336	398	426	576	520
Weight (Full)	kg	417	529	660	891	984	1356	1978	2256	3176	3340
Minimum Working Pressure	bar	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Maximum Working Pressure	bar	8	8	8	8	8	8	8	8	8	8
Coil and Performance Data											
Coil Output (80/60 °C)	kW	45	79	102	106	114	147	149	149	159	159
Coil Surface Area	m^2	1.47	2.45	3.11	3.45	3.72	4.82	5.2	5.2	6	6
Flow Rate (80/60 °C)	l/sec	0.55	0.93	1.19	1.24	1.34	1.73	1.6	1.6	1.69	1.69
Pressure Loss	kPa	5.6	24.4	48.9	10.4	12.8/	25.9	83	83	69.5	69.5
Maximum Coil Temperature	°C	110	110	110	110	110	110	110	110	110	110
Maximum Coil Pressure	bar	16	16	16	16	16	16	16	16	16	16
Max draw off Capacity (first Hour) at 50°C Temperature Rise	l/hr	1083	1706	2164	2420	2642	3497	3926	4206	5176	5456
Heat Up Time at 50°C Temperature Rise	min	22	17	16	22	23	24	40	47	63	69

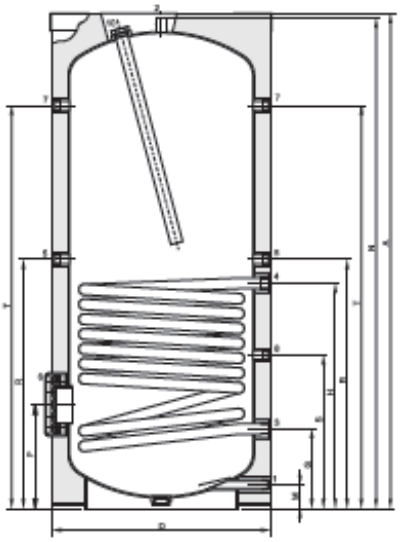
Indirect Storage Vessel Model		SIVT100GE	SIVT110GE	SIVT130GE	SIVT165GE	SIVT220GE
Storage Capacity	litres	388	475	650	730	1020
Efficiency Data - Building Regulations						
Heat Loss	Kw/24 hr	1.56	1.92	1.95	2.19	2.04
Efficiency Data - ErP						
Ecodesign Energy Label rating		C	C	n/a	n/a	n/a
Standing Loss	W	100	104	126	126	146
General Data						
Dimensions (Height)	mm	1710	2045	1840	2035	2005
Dimensions (Width with insulation)	mm	740	760	910	930	1100
Weight (Empty)	kg	145	196	245	262	340
Weight (Full)	kg	533	671	896	992	1360
Minimum Working Pressure	bar	0.5	0.5	0.5	0.5	0.5
Maximum Working Pressure	bar	8	8	8	8	8
Electrical Requirements						
Coil Data						
Coil Output (80/60 °C) Bottom/Top	kW	52/37	68/42	73/40	81/57	88/59
Coil Surface Area Bottom/Top	m^2	1.64/1.15	2.13/1.31	2.39/1.33	2.66/1.86	2.89/1.93
Flow Rate (80/60 °C) Bottom/Top	l/sec	0.62/0.44	0.81/0.5	0.86/0.48	0.96/0.67	1.04/0.69
Pressure Loss Bottom/Top	kPa	7.8/3.0	16.6/4.3	3.7/0.7	5.0/1.8	61/20
Maximum Coil Temperature	°C	110	110	110	110	110
Maximum Coil Pressure	bar	16	16	16	16	16
Max draw off Capacity (first Hour) at 50°C Temperature Rise (Top coil only)	l/hr	810	936	998	1301	1486
Heat Up Time at 50°C Temperature Rise (Top coil only)	min	36	39	56	45	61

PHV480UV Solar preheat vessel dim's and connections as per SIVS110 below

Dimensional Drawings & Connection Details

Legend	Description	Unit	SIVS100GE	SIVS110GE	SIVS130GE	SIVS165GE	SIVS220GE
A	Total height	mm	1710	2045	1840	2035	2005
D	Diameter (without insulation)	mm	600	600	750	750	900
	Diameter (with insulation)	mm	740	760	910	930	1100
G	Coil Outlet	mm	260	260	310	310	350
H	Coil Inlet	mm	1015	1205	1150	1210	1310
M	Cold Water Inlet	mm	70	70	85	85	95
N	Hot Water Outlet	mm	1655	1995	1805	2000	1965
P	Clean Out Opening	mm	330	330	420	420	450
R	Sensor Connection	mm	1100	1290	1240	1300	1400
S	Sensor Connection	mm	500	500	655	655	705
T	T&P connection	mm	1365	1700	1480	1675	1605

Legend	Description	Unit	Size SIVS100GE to SIVS110GE	Size SIVS 130GE	Size SIVS165GE to SIVS220GE
1	Drain/Coild Water Inlet	-	R 1½"	R 1½"	R 2½"
2	Hot Water Outlet	-	R 1½"	R 1½"	R 2½"
3	Coil Outlet	-	Rp 1"	Rp 1¼"	Rp 1¼"
4	Coil Inlet	-	Rp 1"	Rp 1¼"	Rp 1¼"
5	Building Return	-	Rp ¾"	Rp ¾"	Rp ¾"
6	Clean Out Opening Diameter	mm	115	180	180
7	T&P connection	-	Rp ¾"	Rp ¾"	Rp ¾"
8	Sensor Connection	-	Rp ¾"	Rp ¾"	Rp ¾"
10	Magnesium Anode	-	Rp 1¼"	Rp 1¼"	Rp 1¼"



SIVS100GE to SIVS220GE

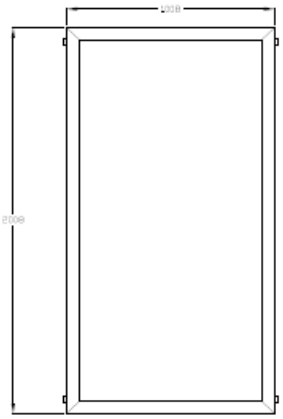
LSP20+ Solar collectors

Flat plate Solar Collectors

Includes:
Fully pre-mounted unit consisting of:
- Flat plate panel
- Meandering heat transfer pipe
- Integrated connection system

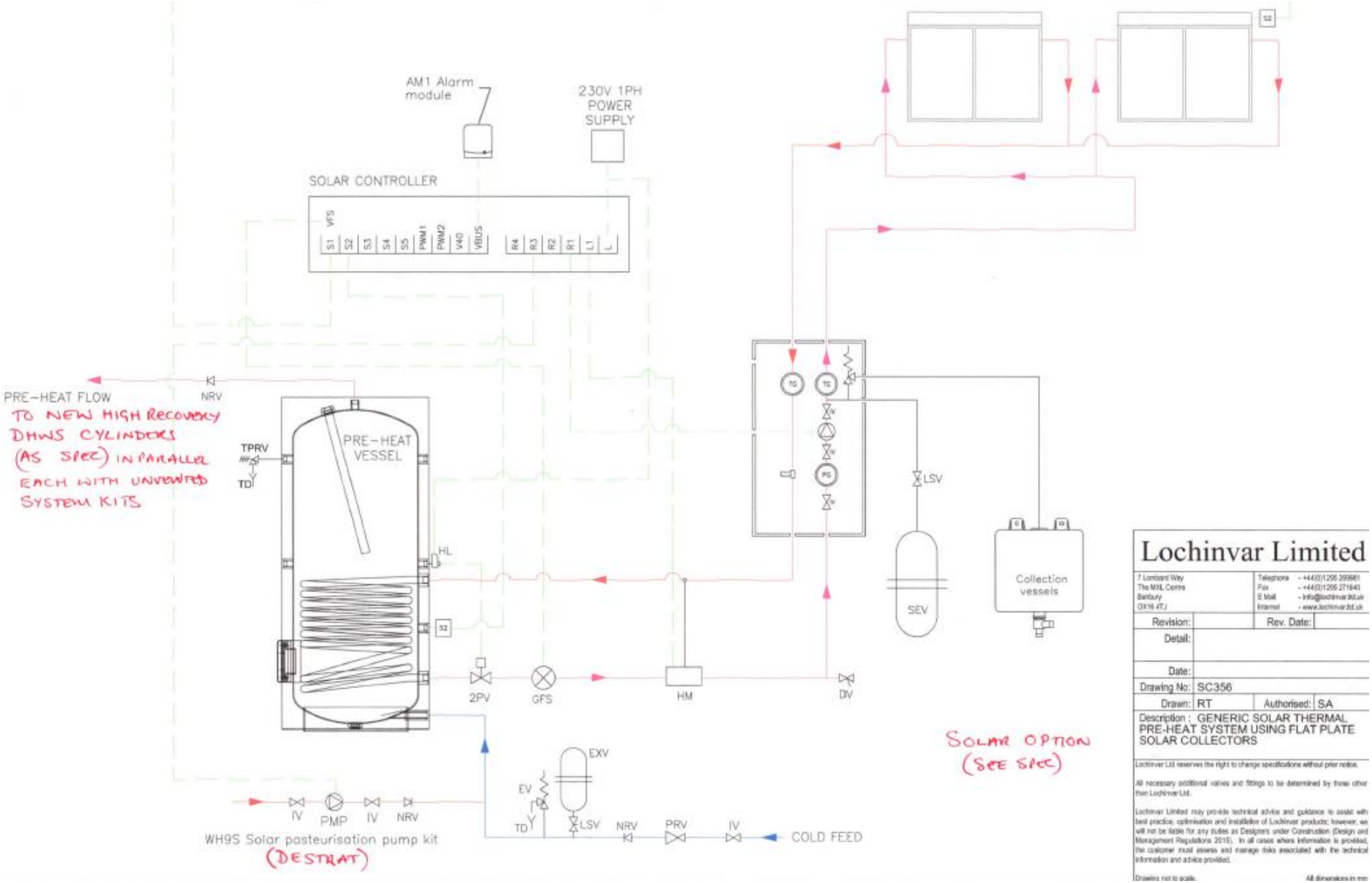
Mounting types:
- Roof mounting
- Roof integrated
- Flat roof / facade mounting

Warranty:
- Parts only 20 years conditional upon: Installation and/or commissioned by Lochinvar approved installers



Collector Identification Reference

Efficiency η_o (Aperture)	%	81
a_{1a} with wind, in relation to aperture	W/(m²K)	3.63
a_{2a} with wind, in relation to aperture	W/(m²K²)	0.011
Grid dimensions (length x width x depth)	mm	2008 x 1008 x 75
Gross surface area	m²	2.03
Aperture area	m²	1.79
Collector contents	litres	1.6
Weight	kg	36
Max. working pressure	bar	6
Max. stagnation temperature	°C	196
Min / max inclination	°	15/90
Glass tube material		4mm Safety solar glass
Collector material		Copper
Test and approvals		EN 12975, Solar Keymark ISO 9001
RHI ready		Yes



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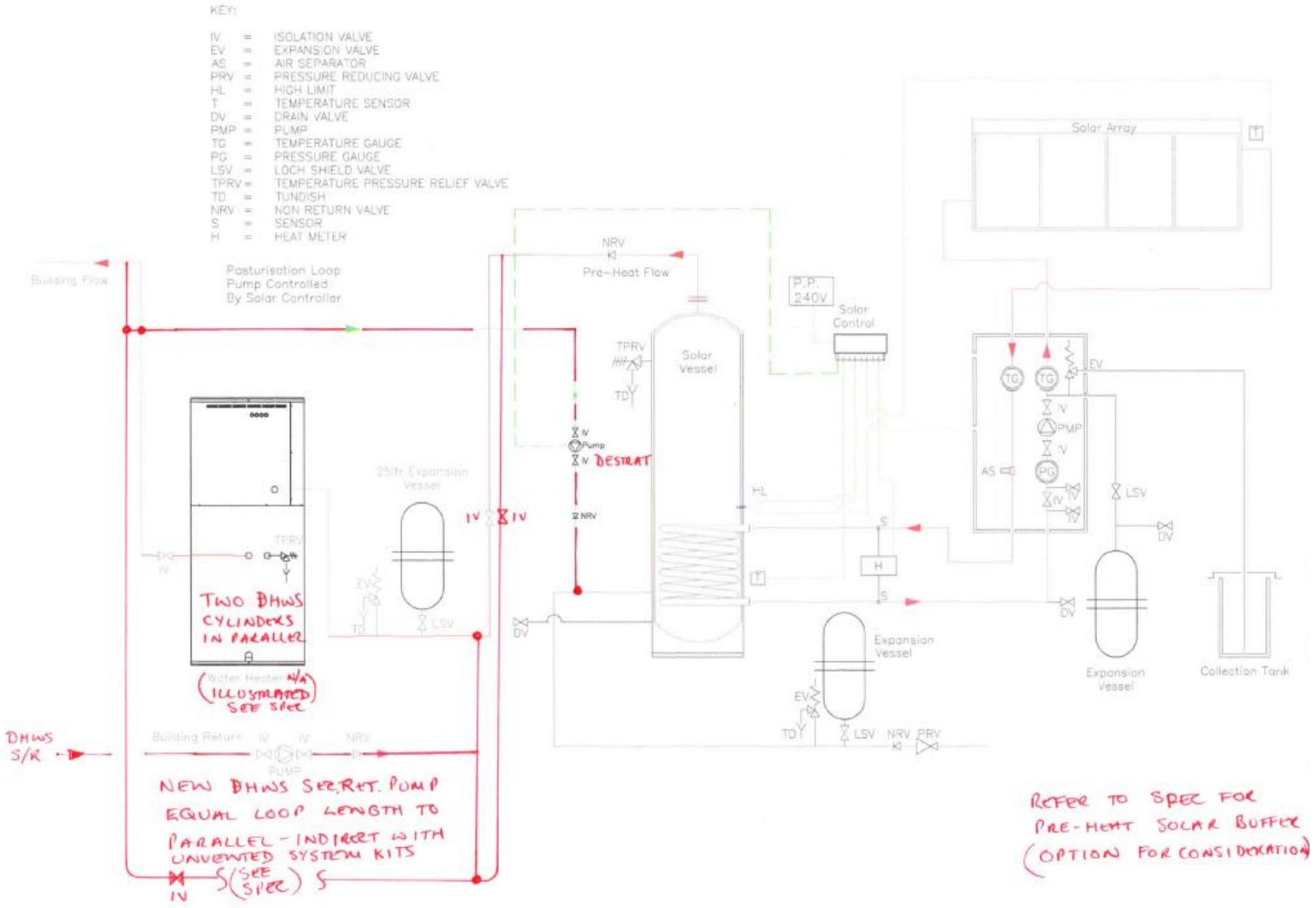
Revision:		Rev. Date:	
Detail:			
Date:			
Drawing No:	SC356		
Drawn:	RT	Authorised:	SA

Description : GENERIC SOLAR THERMAL PRE-HEAT SYSTEM USING FLAT PLATE SOLAR COLLECTORS


KEY:
IV = ISOLATION VALVE
EV = EXPANSION VALVE
AS = AIR SEPARATOR
PRV = PRESSURE REDUCING VALVE
HL = HIGH LIMIT
T = TEMPERATURE SENSOR
DV = DRAIN VALVE
PMP = PUMP
TG = TEMPERATURE GAUGE
PG = PRESSURE GAUGE
LSV = LOCH SHIELD VALVE
TPRV = TEMPERATURE PRESSURE RELIEF VALVE
TD = TUNDISH
NRV = NON RETURN VALVE
S = SENSOR
H = HEAT METER
Pasturisation Loop
Pump Controlled
By Solar Controller
Building Flow
NRV
Pre-Heat Flow
P.P. 240V
Solar Control
Solar Array
Solar Vessel
TPRV
TD
Pump
DESTRAT
25ltr Expansion Vessel
TWO DHWS CYLINDERS IN PARALLEL
(ILLUSTRATED N/A SEE SPEC)
Water Heater
Expansion Vessel
Collection Tank
DHWS S/R
Building Return
PUMP
NEW DHWS SER.RET. PUMP EQUAL LOOP LENGTH TO PARALLEL - INDIRECT WITH UNVENTED SYSTEM KITS
(SEE SPEC)
REFER TO SPEC FOR PRE-HEAT SOLAR BUFFER (OPTION FOR CONSIDERATION)