



Worthing Hospital West Block

**Specification for Procurement of Packaged Domestic Hot Water Services PHE  
& Buffer Vessels**

for

Western Sussex Hospitals NHS Foundation Trust

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Project: Worthing Hospital West Block DHWS Calorifier Replacement

Document: Specification for Procurement of Packaged Domestic Hot Water Services PHE & Buffer Vessels

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**PART A – Preliminaries**

## **A1 The Project Generally**

### **A1.1 Project Particulars**

The Project:

Worthing Hospital West Wing Domestic Hot Water Services calorifier Replacement

Purchaser:

Western Sussex Hospitals NHS Foundation Trust

Employer's Agent:

N/A

CDM Co-ordinator:

TBC

Consulting Services Engineer:

Alonso Marshall Associates

Quantity Surveyor:

TBC

### **A1.2 Intent of Specification**

The scope of supply and work of Vendor shall cover design, engineering, procurement, inspection, testing, packing and delivery of 2 no. packaged plate heat exchanger and buffer vessels complete with controls to site details of which are furnished in subsequent clauses. Each packaged plant shall comprise of 2 sections, to enable positioning in the plantroom.

Each plant section shall be designed to fit within the space constraints mentioned in this specification, to enable delivery and positioning on site.

The Purchaser's objectives are to purchase and receive the successful tenderers equipment and take delivery before 31<sup>st</sup> March 2017.

Alternatively the packaged units shall be stored at works for call off once the site has been prepared. In this case the equipment shall be clearly identified as the property of WSHNFT.

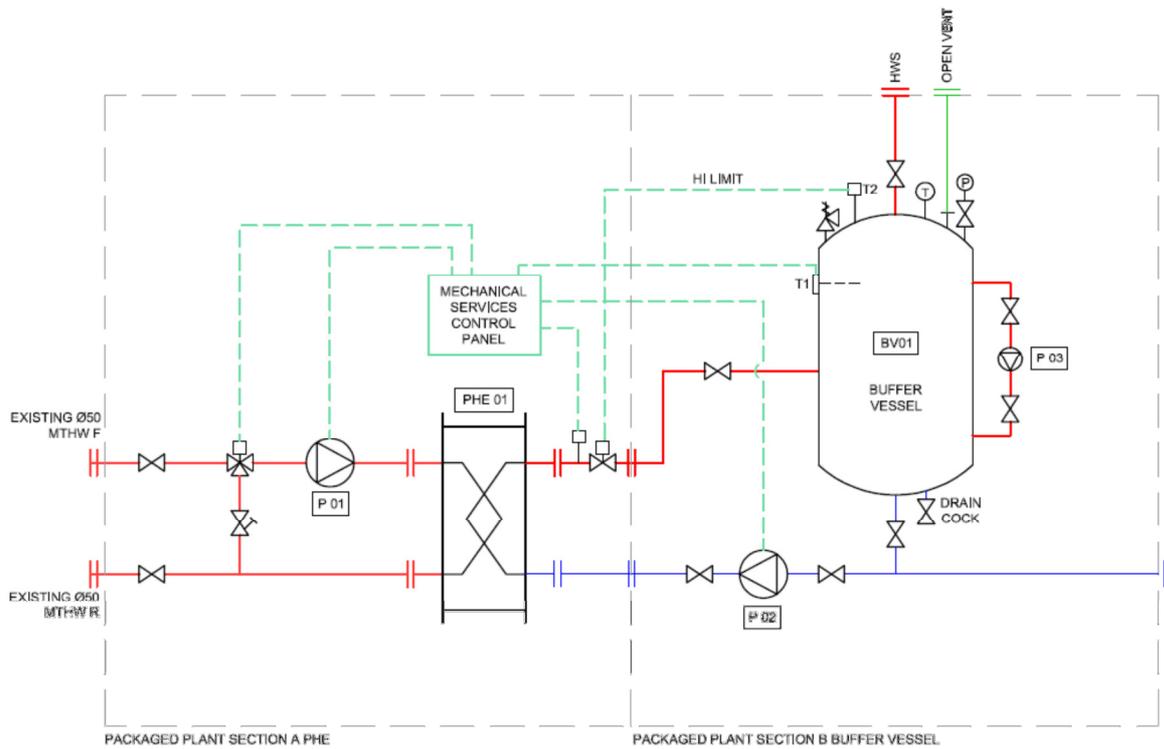


Fig.1 Schematic showing design intent of packaged plant.

**A1.3 The Site/ Delivery and off loading**

The site is located in the grd floor calorifier room of west block, located at Worthing Hospital, Lyndhurst Rd, Worthing BN11 2DH.

The drawing below indicates location of packaged plant and dimensional restrictions in the plantroom.

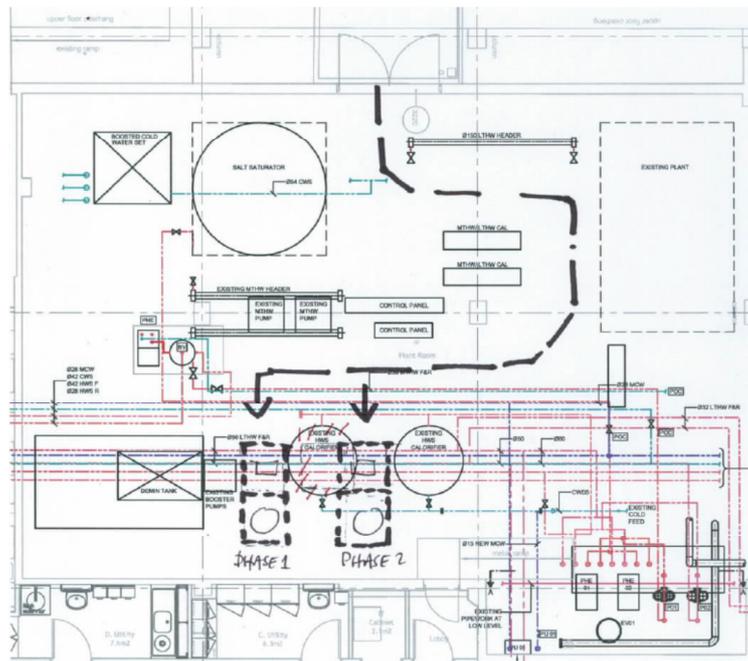


Fig.2 Calorifier Room sketch showing location of packaged plant.

### **A1.4 Instruction to Vendor**

The equipment covered under the scope of supply shall conform to the technical specifications, general requirements and the relevant standards (latest revision) in respect of dimensions, sizes, material of construction, manufacturing, inspection, testing, painting & insulation, marking and packaging procedure.

## **A2 Technical Details for Procurement of Packaged Plate Heat Exchangers**

### **A2.1 Brief Scope of Supply & Work**

The successful tenderer will become a vendor to Western Sussex Hospitals NHS Foundation Trust.

The quotation shall remain open for acceptance for a period of 30 days from date of quotation.

#### Factory Testing

The units will be pressure tested at works.

#### Protection

The units shall be provided with suitable protection for transit.

#### Storage.

The vendor shall offer an option of storage off site, to facilitate phased installation.

#### Transport/Craneage/Offloading

The vendor shall allow in their price for transport and offloading at Worthing Hospital at a location to be agreed with the Purchaser.

#### Commissioning Training

The vendor shall allow to revisit site once the packaged plant has been installed by others to carry out commissioning.

#### Spares

The vendor shall allow to revisit site once the packaged plant has been installed by others to carry out commissioning.

#### Handover Documentation

1 no. electronic copy of operation and maintenance manuals is required, which shall include:

Documentation supplied with the packaged will include:

- Safety Information, nomenclature and unit specification
- Pressure test certificate
- Welding statement
- Declaration of conformity (where applicable)
- Electrical test (where applicable)
- Assembly drawing and parts list
- Wiring diagram

Warranties

The Vendor shall provide a warranty period of 3 years from the date of installation.

**A2.2 References – Design Codes**

The unit(s) will be fully compliant with the Pressure Equipment Directive as detailed in the European Community Directive No. 97/23/EC and CE marked where appropriate. All equipment shall be WRAS approved and compliant with HTM 0401.

**A2.3 Equipment Design Criteria**

Performance required from each packaged plant:

| Parameter                      | Value                      |
|--------------------------------|----------------------------|
| Primary MTHW flow              | 100degC (max temp 120degC) |
| Primary MTHW return            | 80 degC                    |
| MTHW operating pressure        | 5 bar                      |
| Secondary inlet temp.          | 10                         |
| Secondary outlet temperature   | 60                         |
| Cold feed inlet pressure       | 2 bar                      |
| Buffer vessel storage volume   | 1000 litres                |
| Buffer vessel working pressure | 2.5 bar                    |
| Buffer vessel test pressure    | 5.0 bar                    |
| Peak DHWS flow*                | 5.0 l/s                    |
| DHWS demand*                   | 1500 litres per hour.      |

\* In terms of selection to satisfy peak demand, assume both packaged units working together.

Service Connections: MTHW Flow, 50dia (flanged or screwed)  
 MTHW Return 50 dia  
 Cold feed: 76 dia  
 HWS flow: 76 dia  
 HWS return: 54 dia

Physical Dimensions:

The overall physical dimensions for the packaged plant are key to facilitate installation in a phased manner within the existing West Block Calorifier Room. Each packaged plant shall be arranged so that it can be delivered to site in 2 sections, and assembled on site.

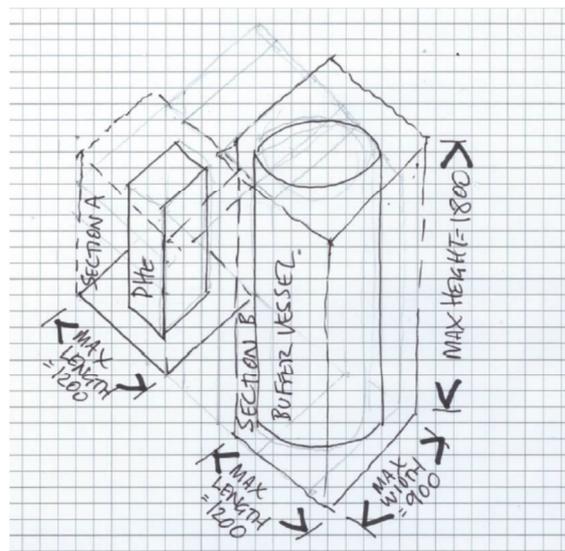


Fig.3 Limiting dimensions of plant.

## **A2.4 Equipment**

### A2.4.1 Plate Heat Exchangers

Plate heat exchangers to be brazed, stainless steel 316, suitable for use with domestic hot water on the secondary side and designed in accordance with the performance specification in A2.3

### A2.4.2 Pipework & valves

Primary MTHW pipework:  
Schedule 40 carbon steel to BS1600 ASTM A106 Grade B.  
Secondary pipework:  
Schedule 10 304 stainless steel secondary pipework.  
Valves shall be bronze and WRAS compliant.

### A2.4.3 Buffer Vessel

Description: Vertical stainless steel grade 316 storage vessel, WRAS approved and in compliance with BS EN ISO 15614-1:2004+A2:2012 and BS EN 12897:2016

Complete with inspection opening, and MS ringstand support.

Design: PED compliant.

Connections & accessories:

1 x 25mm Pressure Temperature Relief Valve  
1 x 20mm Anti-Vac Valve  
1 x 20mm Drain Cock  
1 x 100mm Pressure Gauge  
1 x 100mm Dial Temperature  
Destratification Pump.

The Pressure temperature relief valves shall comply with BS759, suitable for the operating conditions of the systems, and be manufactured by NABIC. The spring shall be pre-set for the lift pressure required and that pressure clearly marked on the body of the valve. Once set, the spring tension adjustment shall be padlocked and remain so throughout the installation period. Two keys for each padlock shall be handed over at the contract completion to the Clients representative.

The valve shall have a manual test lift facility and also the ability to rotate the lift plug on its seating, to clear dirt particles. The lift plug face and seating shall be of dissimilar materials, chosen to avoid corrosion and sticking.)

### A2.4.4 Pumps

|               |                           |
|---------------|---------------------------|
| Description:  | Primary Pump              |
| Type:         | Twin head                 |
| Manufacturer: | Grundfos                  |
| Duty:         | to be selected by vendor. |
| Description:  | Secondary Pump            |
| Type:         | Single head               |
| Manufacturer: | Grundfos.                 |
| Duty:         | to be selected by vendor. |
| Shunt pump:   | to be selected by vendor. |

#### A2.4.5 Controls

Each skid to be provided with packaged controls, including the following components:

3 port motorised valve controlling MTHW flow to plate heat exchanger.

Temperature sensors.

Hi limit stat.

2 port hi limit motorised valve on secondary flow from plate heat exchanger.

Packaged controls to be capable of the following:

Monitoring and control of outlet temperature and temperature in buffer vessel and control of 3 port valve and primary and secondary pump to ensure a minimum storage temperature of 60degC

Anti-legionella pasteurisation cycle.

PID control.

Duty/standby/duty rotate of primary pump P01.

Pump P02 control.

Pump P03 (destratification) pump control.

Compatible with existing site BMS for remote common fault monitoring, remote enable/disable, remote set point adjustment, Remote temperature readings

High limit over temperature protection

Control Panel Display to include

1. Alarms Display
2. Temperature/Parameter Display
3. High Temperature Alarm Indicator
4. Reset Pushbutton

#### A2.4.6 Insulation

Due to site restrictions in terms of delivery of plant, the Vendor shall allow to insulate and clad both buffer vessels in situ with 75mm thick fibreglass mattresses, secured to shell and enclosed in stucco aluminium sheet (self colour). C/w toggle clips to allow removal/replacement at site.

The plate heat exchangers are to be insulated with expanded polypropylene shells.

#### A2.4.7 Frame and Base

Frame and base construction of painted carbon steel, 50mm hollow box section with capped ends.

#### A2.4.8 Site Installation

Each packaged plant shall be designed so it can be split into 2 sections for delivery and positioning, and then bolted together in position on site.

## A3 Purchasers Requirements

### A3.1 General

The following conditions are supplementary to those stated in the invitation to tender and on the Form of Tender and Agreement:

- Programme – and delivery.
- Technical Information – manufacturers drawings
- Quality Control Resources – A statement must be submitted describing the organisation and resources which the vendor proposes and undertakes to provide to control the quality of the sub-contract works.
- Health and Safety Information – Submit a statement with the tender describing the organisation and resources which the vendor proposes and undertakes to provide to safeguard health and safety matters.
- Maintenance Contract – Provide a maintenance contract for twelve months from the date of Practical Completion.
- Annual Maintenance Contract – Submit with the tender a supplementary proposal for an annual maintenance contract.

### A3.2 Quality Standards/ Control

with any type test certificate obtained for arrangement of components.

Standards and Regulations - Provide all materials and works in accordance with the appropriate British Standard or Code of Practice and where no BS or CP is applicable the Agreement Certificate for the particular item.

Comply with all statutory instruments and regulations, relating to the area of the site current at the date of tender. Comply with the requirements of the Local Authority Building Inspector. Comply with all Statutory Obligations arising from current legislation and regulations, together with other requirements, including, but not limited to, the following:

- Statutory Obligations
- Health and Safety at Work etc. Act 1974
- Management of Health & Safety at Work Regulations 1999
- The Working Time Regulations 1998
- Building Regulations 2000 and current amendments
- Building Standards (Scotland) Regulations 1990 and current amendments
- Electricity Acts
- Electricity at Work Regulations 1989
- Factories Act 1961
- The Control of Pollution Act 1974 and Amendment Acts
- The Workplace (Health, Safety and Welfare) Regulations 1992
- The Construction (Design and Management) Regulations 2015 The Construction (Design and Management) Regulations 2015
- The Health and Safety (Display Screen Equipment) Regulations 1992
- The Control of Substances Hazardous to Health (COSHH) Regulations 2002
- The Control of Substances Hazardous to Health (Amendment) Regulations 2003
- Control of Asbestos at Work Regulations 2002
- The Provision and Use of Work Equipment Regulations 1998
- Personal Protective Equipment at Work Regulations 1992
- The Construction (General Provisions) Regulations 1961
- The Lifting Operations and Lifting Equipment Regulations 1998
- Other relevant Safety Regulations
- Public Utility Company and/or Statutory Authority regulations, specifications, and requirements.

- Other Requirements
- British Standards and Codes of Practice.
- BS 7671 - Requirements for Electrical Installations (IET Wiring Regulations).
- BS EN 50110.
- Insurance Company Requirements.
- Ensure all equipment and systems are designed and installed in accordance with the relevant standards and that operational compatibility exists between the systems and any other system installed at the same location.
- Supply plant and equipment to achieve the specified design conditions and to provide stable control.
- For insulation: Comply with online guide to check long term impact of material selection - [www.thegreenguide.org.uk](http://www.thegreenguide.org.uk)

Factory tests to include:

Complete package to be hydraulically pressure tested at works, and certification provided.  
A controls functional test shall be carried out.

**PART E – Tender Deliverables**



## E2 Tenderers Signature

Signed:

Print Name:

Position:

Date:

For and on behalf of:

Appendix 1 Schematic showing design intent of packaged plant

