

OUTLINE PERFORMANCE SPECIFICATION

For the

DESIGN, SUPPLY AND INSTALLATION OF THE MECHANICAL AND ELECTRICAL ENGINEERING SERVICES

Bingley Public WC

Conversion & Refurbishment Works

1.00 STANDARDS

The new buildings development shall be designed and built in the accordance with Building Regulations 2019, European Standards, British Standards and Codes of Practice as well as the following :

- CIBSE Design Guides, Application Manuals, Energy Guide and Commissioning Code
- Current IEE Regulations and Recommendations.
- HVCA Design Guides and Installation Recommendations.
- Current Gas Regulations
- Current Water Supply Byelaws

2.0 THERMAL MODELLING

The design software used for this project shall be IES and be in compliance with the current building regulations design and energy requirements.

For the purposes of Building Regulations compliance The weather data for the Thermal Model shall be CIBSE TRY & DSY. Operating hours shall be been taken as 9 hrs continuous occupation 7 days a week

The Contractor shall be responsible for producing and lodging an Energy Performance Certificate (EPC) on completion of the building. In addition a preliminary EPC shall be produced at detailed design stage to indicate the likely performance of the building.

The Contractor shall be responsible for achieving compliance with Part L of the Building Regulations

3.0 REMOVAL OF EXISTING SERVICES

Existing primary service connections shall be disconnected at source and modified /upgraded as necessary to facilitate the design of the new building use,

4.0 EXTERNAL SERVICES

Electrical

The site has an existing supply which serves the building. This supply shall be modified and upgraded as necessary to accommodate the Contractors Design. The building shall be metered as per the existing metering arrangement .

The contractor shall liaise with the local electricity Company to agree feedback from the PV systems. The contractor shall provide all necessary equipment required by the LEC in order to provide a complete system incorporating feedback to the LEC network.

Mains Water Services

The site has an existing water supply which serves building. This supply shall be modified and upgraded as necessary to accommodate the Contractors Design.

Natural Gas

The site has an existing gas supply which serves both the outbuilding. This supply shall be modified and upgraded as necessary to accommodate the Contractors Design.

Telecoms

The site has an existing Telecoms supply which serves both the outbuilding. This supply shall be modified and upgraded as necessary to accommodate broadband as part of the Contractors Design.

ELECTRICAL SERVICES

Electrical Power Supply

The existing low voltage, power supply shall be retained and/or upgraded to suit the Contractors Design and maintained/obtained from the Electricity Supply Company's LV distribution network.

Final Circuit Distribution

Final circuit distribution equipment shall be provided at strategic locations to service dedicated areas of the building to enable isolation of discrete services without impacting on other areas.

Distribution boards shall be MCB type with lockable doors and a minimum of 25% spare ways.

General Purpose Power Installation

General power shall be provided by ring and radial circuits from local distribution boards for each department and/or tenant area. Fixed single phase electrical items below 3kW shall be connected to ring circuits via switched fused connection units. Larger fixed items of equipment with a single phase supply in excess of 3kW or equipment requiring three phase supplies shall be supplied via dedicated radial circuits and suitable load break switch disconnectors adjacent to the item of equipment. The loads for these items of equipment shall be assessed from the equipment listed.

All socket outlets shall be twin switched type, except for cleaning sockets, which shall be single switched type. Cleaner's sockets shall be fed from a separate dedicated circuit with outlets at a maximum of 10m spacing and within each occupied space and corridors.

2 No Twin Switched Socket outlets in accordance with the room Data Sheet shall be provided at each designated desk position, generally dado mounted.

All circuits shall be in accordance with Section 607 of BS 7671 (high integrity earthing).

Ring and radial circuits feeding socket outlets shall be supplied by RCD circuit breakers at the distribution board, where defined under IEE 17th Edition.

Fused connection units shall be provided for the following items:

- Fire Alarm System
- Security System
- Electrical supplies to mechanical equipment which require no more than 2 Kw capacity (extract fans, water heaters etc)
- Tea Boilers
- All final circuit wiring shall be LSF Flat Twin & Earth

5.00 Containment

Distribution routes, where possible, shall be within common areas. Consideration shall also be given to avoiding routing electrical sub main cables through areas of high fire risk.

Cable Basket shall be medium duty, galvanised steel.

Separate or segregated cable basket systems shall be installed for the Fire Alarm system, miscellaneous systems and IT/Voice structured cabling systems. Consideration shall be taken of the minimum separation distances with other services.

Containment for final circuits shall generally be high impact plastic conduit systems and stirrups within ceiling voids.

Concealed conduits minimum diameter 20mm shall be used to provide the containment routes to/from the trunking and basket systems for the final circuits and IT/Voice cabling respectively.

All dropping conduits below ceiling level shall be recessed and concealed, except for plant areas.

The office power density shall be designed to achieve:

- 2 no TSSO's per desk position
- Power outlets to be provided in accordance with the Room Data Sheets

General Lighting

The General Lighting illumination levels and lighting designs shall be in accordance with:-

- .01 All relevant current CIBSE Code for lighting designs
- .02 LG2 as a minimum in Treatment/Food Prep areas
- .03 LG3 Visual environment for display screens
- .04 Lighting to Office Areas in the Spirit of LG7
- .06 All relevant British Standards and Codes of Practice.
- .07 IES Technical report 'The daylight lighting of buildings'

Lighting circuits shall generally be so arranged that their maximum loading does not normally exceed 75% of the protective device rating generally using 10A MCBs.

Where discharge lighting circuits are designed for high loadings due to the luminaire type, the circuits and the MCBs shall be sized accordingly.

Lighting designs shall be integrated with architectural designs, ceiling systems, interior design schemes, etc.

Lighting shall generally be LED or high efficiency fluorescent luminaires with high Frequency electronic control gear, lamps of the long life type, providing lighting levels and colour rendering in accordance with CIBSE Lighting Guide 2, HBN 46, and the current Building Regulations.

Lighting for the Reception/Waiting/ areas shall be generally be via compact fluorescent recessed downlighters (with decorative attachments) to create visual interest, and complement the interior design.

Illumination shall be to the following minimum maintained standards:

- General circulation 200 lux at floor level
- Administration areas 400/500 lux at desk level
- Waiting areas 300 lux at desk level

Glare shall be minimised for the comfort of staff

A complete system of internal lighting control shall be provided to allow local control of all areas and provide compliance with the building regulations Part L 2014.

A last man out switch shall be provided at the final exit door (1No)

Lamps and Tubes

Fluorescent tubes shall be manufactured to BS 1853 and shall be T5.- or LED

All general areas shall utilise white colour lamps (3500°k) all lamps shall be of the triphosphor type.

Emergency Lighting

Emergency lighting shall be designed and installed to comply with Building Regulations and where appropriate shall comply with with BS 5266 Parts 1 and; 1999 and BS EN 1838. Due consideration shall be taken of the defined escape routes and any other requirements of the defined routes and any other requirements of the Building Control and/or Fire Officer.

Emergency lighting shall be provided primarily by emergency versions of the normal lighting fittings. Self-contained illuminated emergency exit signs (maintained) shall be installed above all final exits, with non-maintained bulkheads outside. All emergency fittings shall have integral battery backup for a minimum of 3 hours.

Additional illuminated emergency exit signs shall be provided to supplement any Architectural signage, in order to meet the Building Control/Fire Officer's requirements. Routine testing of the emergency lighting shall be by local test key switches.

External Lighting

The external lighting scheme shall be designed and installed in accordance with all relevant British Standards, Codes of Practice, the CIBSE Code for exterior lighting and BS 5489 Part 9.

The external lighting installation shall fully conform to the Dark Sky Directive.

A strategy for external lighting shall be designed and installed to provide illumination to all exit and entrance doors in accordance with all relevant British Standards, Codes of Practice, CIBSE guide "The Outdoor Environment" and BS 5489-1-2003.

Control of the external lighting shall be via photocell control/time control. A manual override facility shall be provided for maintenance purposes.

All external lighting luminaires shall be building mounted.

Earthing

Earthing arrangements and protective conductors shall be in accordance with BS 7671 and BS 7430.

Functional earth connections and conductors shall be provided for both IM&T and telephone equipment.

Lightning Protection

A lightning protection system shall be installed where necessary in accordance with BS6651

IM & T Communications

The data and telephone installations shall comprise of CAT 5e UPT cabling and RJ45 outlets, fully terminated and tested to ISO110801 and TSB67.

Each outlet, designated either voice or data, shall comprise of a single enhanced Category 5 RJ45 outlet at the user end, and shall be wired on to a hub portlocated in the office area.

No single point outlets shall be installed. All outlets shall be double.

The following shall be provided:-

For each RJ45 outlet designated for use for Voice services, a ¼ metre Yellow RJ45 – RJ45 CAT 5e patch lead, together with a 3 metre Yellow RJ 45

RJ45 Cat 5e patch leads.

For each RJ45 outlet designated for use for Data services, a ¼ metre Yellow RJ45 – RJ45 CAT 5e patch lead, together with a 3 metre Yellow RJ 45

RJ45 Cat 5e patch leads.

All active equipment, in the form of switches, routers etc. shall be the responsibility of the end user.

Full handover documentation shall be provided following completion of the installation. This will take the form of Warranty Certification, test data in electronic and paper format and outlet location drawings.

Disabled Alarm System

The Contractor shall design; supply and install a disabled WC call system to the disabled toilet .

Intruder Alarms

A NACOSS Approved open protocol intruder/security detection system, generally by Dual technology PIR sensing & Magnetic contacts, shall be provided as follows:

Ground Floor

To all ground floor areas with external windows and doors. All External doors shall be protected by magnetic contacts.

The Staff entrance/final exit door shall have separate intruder keypad control panel.

The systems will be provided with the facility for 'open protocol' remote off site monitoring via a secure communications route.

Integral battery back up facilities shall be provided with this system.

Fire Detection and Alarm

An open protocol fire alarm system shall be provided throughout the Reception and Utility buildings which shall comply with the recommendations of BS 5839: Part 1 2002, including Amendment 1 and shall conform to the requirements of the Building Control Officer in every respect.

The main fire alarm system control panel shall be located adjacent the main office entrance and shall operate and monitor all fire alarm and detection functions throughout the buildings. The main panel shall provide full alarm, fault and health monitoring of the detection loops and alarm circuits. A manual override facility shall be provided to allow auxiliary equipment to be overridden during testing of the system.

The fire alarm system shall be provided with self contained battery backup at the main panel.

Suitable interfaces shall be provided to include mechanical plant shutdown,

The system shall be fully analogue addressable, with both visual and audible alarm indication at the main reception area and have the 'capability' of off site monitoring facility (e.g. BT Redcare).

The design of the system shall cater for at least 25% spare capacity in all detection loops and sounder circuits.

Red Zenon beacons shall be provided for the benefit of the hard of hearing.

Where detection devices are located within areas which are normally locked or not visible a remote L.E.D. shall be provided to indicate operation of the device.

All fire alarm system cabling shall be carried out using fire resistant cable complying with BS6387 categories C, W and Z.

RENEWABLE ENERGY SYSTEMS

The Contractors attention is drawn to Compliance with Building Regulations 2 whereby it is the Contractors responsibility to ensure that a prescribed minimum percentage improvement on Target Emissions Rate shall be achieved.

The Contractor shall having undertaken his own assessments provide all necessary LZC Technologies to achieve the target figures to ensure that the Target Emissions Rate shall be achieved.

Where Renewable Energy is required the Contractor shall utilise a PV solution in part or whole generally in the spirit of the following

Photovoltaic (PV) Array Installation

The Contractor shall design, supply, install, test and commission a PV array onto the rooftop of the new buildings.

The panels shall be certified and approved on the "Microgeneration Certification Scheme" database to enable "Feed In Tariffs" to be received by the client. The panels shall be type tested in accordance with IEC 61215.Ed 2 and IEC/EN 61730

Upon completion of the system, the contractor shall register the system through the MCS with OFGEM and issue the MCS certificate as part of the O&M information.

The panels shall be based on mono-crystalline technology and shall have a STC conversion efficiency of not less than 15%. The output degradation time profile shall be such that after 12 years the output is at least 90% of the minimum rated power (P_{min}) and after 25 years the output shall be at least 80% of minimum rated power.

The PV panels shall be mounted on a proprietary frame. DC cables shall be solar specific double-insulated and clipped to a suitable containment system both on the roof and within the building.

Cables running vertically shall be clipped to the frame, horizontal cable runs shall be secured to cable basket. All cabling, ties, clips and fasteners shall be resistant to the effects of UV light including embrittlement. Each string shall be provided with its own local isolator rated for the maximum string design voltage.

The Panels and proprietary frame support system shall not be fixed directly to the roof to resist wind but shall be provided with a proprietary footing and ballast system for this purpose. No penetrations to the roof structure are permissible.

The array shall be arranged and so that no part of it is shaded at any time of the year and to ensure that all panels can be cleaned and inspected from a standing position using an extended brush and water hose, without risk of damage to the panels and without the need for steps or platforms.

G83/G59 works are to be undertaken by a REC approved contractor.

The Contractor shall include for all REC requirements including arrangement of a 'feed in tariff' and works such as furnishing of test and commissioning data information site attendance to witness testing (if required) and all other DNO requirements.

Upon completion of the works, the contractor shall on behalf of the client, provide REC with confirmation of installation and commissioning data (G83/G59 Appendix) to allow REC to update their records including for all site attendances required the REC for their testing & commissioning.

Main Low Voltage Switchgear G59 Inverters & Protection

All sources of on-site electrical energy generation shall be connected via proprietary inverters certified to G59/2 in order to protect the grid and the local, private distribution system. The settings for the inverter shall be agreed with the DNO, specific to the UK

Each inverter shall be provided with a switch-disconnector or a protective device on each input and each output. The switch-disconnector or protective device shall be suitable for use as a point of isolation in accordance with BS EN 60947 and shall be capable of breaking the load safely under fault conditions.

Earthing Arrangement

The Contractor shall allow for liaison, co-ordination and termination of main equipotential/supplementary bonding and earthing conductor requirements in accordance with BS7671 and BS 7430 whilst adhering to all local regulations.

Sub-metering/Import Export Metering

Metering is to be provided as required to meet MCS, DNO and ECA minimum requirements.

Testing and Commissioning

Whenever reference is made to a British Standard (BS) a British Standard Institution recognised equivalent European Standard would also comply. Each type of equipment/material selected shall comply fully with either the BS or the European Standard.

BS 7671 IEE Wiring Regulations (17th Edition)

BS 5266 Code of Practice for the installation of Emergency Lighting CIBSE Commissioning Codes.

The Contractor shall specifically include for

- G59 final notification to CE Electric
- MCS notification (this enables you to claim your feed-in tariff from your energy supplier only MCS accredited companies can make this notification).

MECHANICAL SERVICE

LPHW HEATING

The Contractor should obtain the approval of the Employer's Agent to the siting of all Mechanical and electrical equipment and controls

Space Heating and Hot and Cold Water The design criteria shall be as follows:

External Winter -4oC db -4oC wb

Internal Temperature Control as the Room Data Sheets Internal set back temperature shall be no less than 14oC.

The Building shall be heated using a traditional gas fired condensing heating combination boiler utilising self finished LST panel radiators with thermostatic valves in all rooms. Each boiler shall be high efficiency 90.1% SEDBUK2009 minimum 88% capable of simultaneous and individual operation of both heating and hot water systems and have a load compensation facility. The boiler to be as manufactured by Worcester Bosch, Buderus, Ideal or equal and approved.

The hot water delivery from the Boiler shall be limited to serving hot water to the Reception Building only – The Utility Building hot water shall be via Under Counter Electric Storage Water Heaters.

The boiler shall be provided with a separate thermostat to act as frost stage protection.

The boiler shall be complete with all integral time controls, pump and expansion vessels. The boiler shall be provided with a safety valve discharging to the foul drainage system by a suitable in line odourless trap. The boiler shall have a condensate drain discharging to the foul drainage system by a suitable in line odourless trap.

The Boiler flues shall be designed and installed to the manufacturers recommendations and shall discharge through the walls or through the wall with a suitable cowl.

A digital programmable controller shall be provided to give setback and master temperature control, separate Zone control valves shall be provided for the Reception Building and the Utility Building. Remote digital Thermostats shall be provided for each zone control to communicate with the master controller.

Controls shall fully comply with the Domestic Building Services Compliance guide

A mains water cold fill loop shall be provided for quick fill and topping up procedures to the sealed system.

All heating pipework in unheated areas to be insulated (including ceiling voids and pipework within the Store room.

All heating water pipes within habitable rooms to be concealed either in pipe boxings or within floor or wall voids except final connections to radiators and appliances.

From the Boiler copper pipe work to be insulated where concealed and connected to each appliance. Hepworth Hep20 may be utilised as an alternative pipework material utilising proprietary system fittings – No fittings will be allowed within concealed locations – i.e. walls chases, stud partitions.

All visible heating, hot and cold water pipework to be primed and painted two undercoats and one coat gloss.

All pipes in floor ducts to be wrapped and protected with metal covers. And general design and layout to be neatly set pipe work properly clipped and supported to prevent pipe vibration and installed to avoid proximity of hot and cold pipes.

All pipes in wall chases to be protected with metal capping covers. And general design and layout to be neatly set pipe work properly clipped and supported to prevent pipe vibration and installed to avoid proximity of hot and cold pipes. Pipework drops within walls shall be uniform in design , in that they shall be centreline of radiator all concealed pipework shall be identified on the individual 'as Fitted ' drawing

Provision for easy draining of the heating system shall be included for in the design located in easy to maintain positions.

Stelrad or equal and approved LST Steel panel radiators complete with thermostatic valve on the flow and LSV on return to be provided to all rooms. The locations and sizes of each radiator shall be agreed with Bowman Riley at Design stage.

Only one appliance per zone shall not have a TRV valve.

Pipework distribution shall be table 'X' copper tube with a minimum dimension of 15mm I.D.

All heating pipework in unheated areas to be insulated. Thermostatic radiator valves to be Danfoss or equal and approved

Each system shall be tested and commissioned in accordance with current regulations.

Gas service pipework shall be installed from the meter position to the boiler.

Only Gas Safe registered installers may be used for installation of gas heating systems and Safety Certificates must be provided.

Domestic Water Services

- a) Potable water service
- b) Hot water services
- c) Connections to sanitary appliances, domestic appliances and boiler

The water services systems shall be designed to meet the following design criteria.

- a) Pipework systems are to be designed to the recommendations of CIBSE.
- b) Cold Water storage shall not be provided, the site and systems shall be serviced purely by the Local Water Company mains water supply.
- c) The control of Legionella and prevention of Legionnaires Disease in accordance CIBSE TM13
- d) Water flow rates shall be in accordance with sizing procedures in CIBSE Guide Book G.
- e) Water velocities shall comply with CIBSE and not to exceed 1.0 m/s below 54mmØ and 1.5m/s at and above 54mmØ, or such lower velocities as are necessary for silent operation.
- f) The Domestic Water Systems shall comply with the requirements and codes of practice laid out in BS6700 with particular reference to sterilisation of pipework, which must shall applied to all mains and hot water services
- g) Drain cocks shall be provided at all system low points and air vents at all high points.
- h) Disabled WC's shall have a maximum effective flush volume of 4.5 litres. All other WC's shall have 6L/4L dual flush facility.
- i) Where dual flush toilets are specified they have guidance or symbols instructing the user on the appropriate operation of the flushing device. This can be provided on the flush control buttons, cistern, or nearby for a group of cisterns. Flushing controls to WC;s must be suitable for 'frail/infirm hand' use
- j) All WC cisterns shall be provided with a delayed action inlet valve
- k) Kitchen taps shall have a maximum flow rate less than 5 litres / min for a water pressure of 0.3MPa.
- l) Wash Hand Basins taps shall have a maximum flow rate less than 3.75 litres / min for a water pressure of 0.3MPa.

Incoming Mains Cold Water

Mains cold water supplies shall be provided to the Reception Building and the Utility Building to serve the Combination Boiler, All Sanitary Fittings, Electric water Heaters and Domestic appliances (Washer)

The cold water supply shall incorporate a purpose made anti-shock device to alleviate water hammer.

All pipework which runs in unheated spaces shall be trace heated to protect against freezing.

All internal mains hot and cold water pipework distribution pipework, fittings, valves and accessories shall be undertaken utilising copper or stainless steel.

Isolating valves shall be installed not more than 100mm from the main branch connection. Deadlegs on cold water services shall not be permitted

All insulation shall achieve a minimum Green Guide to Specification rating of A+ . Drain cocks shall be provided at all system low points.

An external bibtap shall be provided for washdown and general usage purposes. This shall be mounted in a position on the Utility building as agreed with PSK

Hot Water System

Hot Water Services shall be designed to meet the requirements of Part L Building Regulations.

Hot water storage shall comply with the CIBSE Guides.

Hot water shall be generated employing Primary LPHW Heating Combination boiler.

Hot water to the Utilites building shall be generated employing Electric UTC storage water heaters. The systems shall be complete a 7 day time clock.

The system shall be designed to incorporate a periodic pasteurisation facility

The domestic water pipework shall be run in the corridor areas and not over the rooms to allow maintenance and isolation of rooms.

Thermostatic temperature control shall be provided within staff and public access areas to limit the outlet water temperatures to safe levels in compliance to the current Health Guidance Note on safe water temperatures.

All hot water pipework distribution shall be thermally insulated throughout except where on view immediately adjacent to sanitary appliances.

All insulation shall achieve a minimum Green Guide to Specification rating of A+ .

Ventilation.

Ventilation shall be provided to comply with Building Regulations with the following enhancements

General Supply and Extract Ventilation Systems

The ventilation is to be achieved by openable windows, but where supply and extract ventilation is required to meeting room and Treatment/Food Preparation areas, a mechanical ventilation system shall be provided controlled by local switching for occupant control

Fresh air that is supplied mechanically shall be provided at a minimum of 10 litres/second per person where necessary.

Ductwork shall be designed in accordance with CIBSE recommendations. Flexible ductwork connections from the duct to the grille shall be a maximum of

600mm and shall not be distorted by sudden changes in direction.

Ductwork shall be manufactured and installed in accordance with HVCA DW 144.

Sound insulation of plant and in-line Attenuators shall be provided where necessary to achieve the Noise Criteria as detailed.

Balancing dampers shall be provided at all grilles/valves and on branch ducts To achieve the design flow rates.

All ductwork shall be thermally insulated to prevent condensation formation

Return air ductwork shall be insulated where it passes through unheated areas.

All insulation shall achieve a minimum Green Guide to Specification rating of A+

Toilets, Showers, Disabled Toilets and Cleaners Stores

Extract Ventilation from toilet and utility areas shall be provided by dirty extract ventilation systems with PIR/Local Lightswitch interface.

The extract from toilet etc shall be local light switch controlled with over-run

Fresh air make up shall be via the surrounding areas. Stainless steel or similar finish non-vision door transfer grilles shall be provided.

The systems shall be complete a 7 day time clock

Acoustic and Vibration Transmission

Mechanical Services Noise Criteria

All Areas NR35

Above Ground Sanitation Systems

A fully ventilated sanitation pipework system shall be provided to conduct wastewater from sanitary and wastewater fittings to the underground drainage system.