Method Consulting

Intelligent engineering, sustainable buildings

Midsomer Norton Town Hall – Phase 1

M&E Services Specification

February 2022

Document History

This document has been revised and issued as below:

Revision	Date	Description	Created by	Approved by
P01	10/01/22	First Issue	DMS	MAS
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Contents

1 Introduction

This specification has been written to describe the proposed mechanical and electrical works for the first phase of the refurbishment project at Midsomer Norton Town Hall, Radstock and shall be read in conjunction with all relevant drawings and documents as listed in the Document Issue Register.

The project comprises the re-modelling of the ground and first floor areas of an existing Grade II listed building to provide a new reception, office, accessible WC as well as the refurbishment of the existing Market Hall. All modifications to the existing structure must be of a sympathetic nature and agreed with the conservation officer.

2 Project Phasing & Future Provision

2.1 Phasing

The overall refurbishment project is planned to be completed in two phases (pending funding available for phase 2), this contract is for phase 1 of the refurbishment:

- Phase 1: Refurbishment of Market Hall and other ground floor areas (incl. incoming supplies). Partial refurbishment of first floor to form a new WC area and circulation space.
- Phase 2 (pending funding): Refurbishment and remodelling of second floor (incl. Assembly Room) and third floor areas.

2.2 Spare capacity

New incoming supplies have been sized with spare capacity to allow for provision of Phase 2 of the refurbishment (e.g., future additional WC areas, heat pumps etc.)

3 Engineering Services Scope of Works

3.1 Scope

The Contractor shall undertake all works associated with the provision of new/diverted/modified/stripped out mechanical and electrical services (including builder's work – which shall be undertaken by the Main Contractor) as described in the following contract documents prepared by Method Consulting:

- Mechanical & Electrical Services Drawings
- Mechanical & Electrical Services Specification
- Mechanical & Electrical Services Equipment Schedules
- Instructions issued and ratified during the course of the works
- Refer also to documents prepared by the Quantity Surveyor, Architect & Structural Engineer

The engineering services works shall be undertaken as described in this specification. The Contractor's scope of works includes the supply, installation, testing and commissioning to form complete and working systems. This includes staff instruction in the use of new services installations. Removals shall also be included for identified redundant equipment and systems, whether complete or parts of existing installed systems. All containment, supports and bracketry shall be included. Allow for attendances on all specialist contractors.

Statutory requirements

The execution of all mechanical and electrical services design and installation works shall comply strictly with all applicable laws, rules, regulations and codes of practice including but not limited to the latest standards, codes, rules and regulations of the following Institutions and Bodies:

- Chartered Institute of Building Services Engineers
- CIBSE Society of Light and Lighting
- The Institution of Engineering and Technology
- Institute of Plumbing
- British Standards and Codes of Practice (including harmonised versions of European Standards)
- Institute of Refrigeration
- Health & Safety Executive
- The Institute of Gas Engineers
- Heating and Ventilation Contractors Association
- Government Indemnity Scheme

Asbestos

The M&E sub-contractor shall review all on-site Asbestos Management Plan and CDMC file prior to carrying out any works on site. Should the Mechanical & Electrical Contractor, during the execution of their work, identify any form of Asbestos and/or hazardous materials not previously identified and being dealt with under the contract, the Contract Administrator shall be notified immediately and the M&E sub-contractor operatives withdrawn from the area awaiting further instructions.

The Contractor and their operatives shall be aware of their obligations under the Health and Safety at Work Act and COSHH (Control of Substances Hazardous to Health) Regulations.

4 Building Regulations Part L – Conservation of Fuel & Power

As this project involves an internal refurbishment of an existing building, Part L2B of the Building Regulations applies.

This does not require a particular overall carbon emissions rate to be achieved/ demonstrated for the building as a whole, but new services and other controlled elements (e.g. any replacement thermal elements) will need to comply with the minimum elemental standards given in Part L2B and the Non-Domestic Building Services Compliance Guide. However, the listed nature of the building may allow specific items to be exempted from these requirements if these cannot be achieved without compromising the historic character of the building.

5 Specialist Contractor Designed Packages

There are a number of packages for which detailed design shall be completed by specialist subcontractors based on a performance design and indicative drawings by Method. These include:

- **Audio Visual systems**
- **Security systems** (incl. Access control, CCTV, intruder alarm etc.)
- **Fire alarm system** (incl. modifications to the existing system)
- **Assistance call system**
- **Hearing aid induction loop**
- **Building & Energy Management System (BMS)**

- **Lightning Protection system**

The relevant specialist shall be responsible for developing the design, supply, installation, testing, commissioning and setting to work of all these systems and the M&E sub-contractor shall manage the process.

6 Contractors Drawing Submittal and O&M Manuals

The Contractor shall issue the following documents, for review, before installation works commence:

- **Installation drawings for all services** – to be based on the design drawings and kept updated by the contractor to reflect any changes made on site
- **Combined services coordination drawings**
- **Ductwork fabrication drawings**
- **Detailed wiring containment proposals**
- **Technical submittals for CDP elements (CCTV, Security Alarm and Detection, Fire alarm installation, Assistance call system and Hearing aid induction loop),** to include datasheets for all proposed equipment, wiring schematics and installation drawings (as above)
- Building & Energy Management System technical submittal, to include description of operations, panel drawings and datasheets for proposed sensors, wall controllers etc.
- **Plantroom layout drawing** including sections and access requirements for maintenance

All layout drawings shall be produced at 1:100 or 1:50 scale @ A1. All plantroom and details drawings shall be produced at 1:20 scale @ A1.

On completion, the contractor shall provide an Operations and Maintenance (O&M) manual to fully comply with BSRIA BG79/2020. Provide 2no hard copies + 2no CD copies.

For the O&M manual the Contractor shall produce fully coordinated 'as built' drawings, (not as last instructed or construction issue drawings), but drawings that are checked and signed off as representing what has been installed.

Other information required includes:

1. Health and Safety Precautions
2. Description of Installation, date of completion etc.
3. Description of Installation
4. Schedules of Equipment, Manufacturer details etc.
5. Operating procedures
6. Routine Maintenance (Specific and with frequencies tabulated)
7. Copies of distribution board charts
8. Testing and Commissioning certificates
9. Manufacturers Literature (relevant, not whole catalogues, clearly identifying equipment used)
10. Labelling of all smoke/heat detectors and emergency lighting points

The Contractor shall also update the Building Log in accordance with TM31.

Refer to the Preliminaries for further details regarding the requirements of the O&M manuals.

7 Training

The Contractor shall prepare a training schedule for building occupiers/premises managers, timed appropriately around handover and proposed occupation plans, which includes the following content as a minimum:

a) The building's design intent.
b) The available aftercare provision and aftercare team main contacts, including any scheduled seasonal commissioning and post occupancy evaluation.
c) Introduction to, and demonstration of, installed systems and key features, particularly building management systems, controls and their interfaces.
d) Introduction to the Building User Guide and other relevant building documentation, e.g. design data, technical guides, maintenance strategy, operations and maintenance (O&M) manual, commissioning records, log book etc.
e) Maintenance requirements, including any maintenance contracts and regimes in place.

8 Maintenance, Defects & Warranties

All maintenance and warranty costs for the first 13 months after handover shall be included and executed within this contract.

9 Commissioning

The Contractor shall complete a schedule of commissioning and testing that identifies and includes a suitable timescale for commissioning of all complex and non-complex building services, control systems and testing.

The schedule shall identify all the appropriate standards that all commissioning and testing activities will be conducted in accordance with, such as current Building Regulations, BSRIA and CIBSE guidelines and/or other appropriate standards, where applicable.

A commissioning specialist shall be appointed to test and commission all new building services systems in line with best practice in the industry, the current Building Regulations. Applicable codes include;

CIBSE Commissioning Codes: Set of Seven Codes (2003):

CIBSE Commissioning Code A: Air Distribution Systems (1996 confirmed 2006). ISBN: 9780900953736
CIBSE Commissioning Code B: Boilers ISBN: 9781903287293
CIBSE Commissioning Code C: Automatic Controls ISBN: 9781903287132
CIBSE Commissioning Code L: Lighting (SLL Commissioning Code L). ISBN: 9781903287323
CIBSE Commissioning Code M: Commissioning Management. ISBN: 9781903287330
CIBSE Commissioning Code R: Refrigerating Systems. ISBN: 9781903287286
CIBSE Commissioning Code W: Water Distribution Systems ISBN: 9781906846152.

BSRIA Commissioning Guides:
Application Guide 1/91 - Commissioning of VAV systems in Buildings
Application Guide 20/95 - Commissioning of Pipework Systems
Technical Memoranda 1/88.1 - Commissioning HVAC Systems
Application Guide 3/89.3 - Commissioning of Air Systems in Buildings
Application Guide 29/2011 - Pre-commission Cleaning of Pipework Systems
Application Guide 2/2010 - Commissioning Water Systems
Application Guide 11/2010 – Commissioning Job Book

As a building management system (BMS) is specified, the Contractor shall also account for the following:

1) Commissioning of air and water systems is carried out when all control devices are installed, wired and functional.
2) In addition to air and water flow results, commissioning results include physical measurements of room temperatures, off coil temperatures and other key parameters as appropriate.
3) The BMS/controls installation should be running in auto with satisfactory internal conditions prior to handover.
4) All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface before handover.
5) The occupier or facilities team is fully trained in the operation of the system.

The Contractor shall ensure that an appropriate project team member is appointed to monitor and programme pre-commissioning, commissioning, testing, and, where necessary, re-commissioning activities on their behalf.

The Contractor shall account for the commissioning and testing programme, responsibilities and criteria within their budget and main programme of works, allowing for the required time to complete all commissioning and testing activities prior to handover.

Specialist Commissioning Manager

The Contractor shall ensure that for all complex services a specialist commissioning manager is appointed prior to installation with responsibility for:

a) Undertaking design reviews and giving advice on suitability for ease of commissioning.
b) Providing commissioning management input to construction programming and during installation stages.
c) Management of commissioning, performance testing and handover/post hand-over stages.

Where there are simple building services, this role can be carried out by an appropriate project team member, provided they are not involved in the general installation works for the building services systems.

Seasonal Commissioning

The Contractor shall account for the following seasonal commissioning activities, to be completed over a minimum 12 month period, once the building becomes substantially occupied:

i. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback.
ii. Take all reasonable steps to re-commission systems following the review to take account of deficiencies identified and incorporate any relevant revisions in operating procedures into the O&M manuals.

10 Power Failure Test & Spares

10.1 Scope

Simulated failure

Once the installation has been installed, set to work and is functioning under normal control the Contractor shall undertake a simulated power failure test. The test is to determine that all emergency lighting is fully operational and that plant resets itself or end users are shown how to reset it. Following the restoration of power, the power supplies and plant equipment shall be checked to ensure they have reverted to normal operation.

Spares

The Contractor shall free issue the following spares to the Client on handover:

- 2No. lamps of each type for lighting
- 1No. cartridge valve flow restrictor of each type
- 2No. spare filters for MVHR 02

11 Strip out & Existing Circuit Tracing

11.1 Scope

All local redundant M&E services within the refurbished areas on the ground and first floors shall be stripped out and disposed of.

Prior to strip out, the contractor shall allow time for opening-up building fabric and tracing existing mechanical and electrical services in order to identify services to other areas (i.e. phase 2 areas) which run through the refurbished phase 1 area.

Such services shall be clearly identified on site and brought to the attention of the project team and Contract Administrator. Such services shall either be protected throughout the works, if practical, or diverted if not.

For example, the existing distribution board (DB 03) serving the second floor area is currently located within a cupboard on the first floor due to be demolished. This will need to be moved up to the second floor and existing cabling traced to confirm available locations for the board.

The contractor shall also ensure that existing LTHW heating flow rates for the second floor heating circuit are measured and recorded prior to any works on the system – this is to ensure that the heating circuit is re-balanced correctly at the end of the project.

12 Water & Energy Metering

Sub-metering of different sources of energy and water consumption within the building is required. Refer to the drawings for details.

Generally, sub metering shall be provided in accordance with Building Regulations and CIBSE Guide TM 39 and to monitor electrical usage of any individual supply above 10kW.

13 BREEAM

We understand that this is not required.

14 Below Ground Drainage

Specified by the **civil/ structural engineer** – Please refer to kb-2's package for further details

15 Above Ground Rainwater Drainage

Specified by the **Architect** – Please refer to PH3's package for further details

16 Above Ground Foul Drainage

16.1 Scope

The scope of works includes the supply, installation, testing and commissioning of new above ground foul drainage installation to drain all sanitary appliances and services plant within the refurbished Phase 1 area.

16.2 System Description

All sanitary appliances (refer to Architect's drawings) requiring a waste outlet shall be drained by the above ground foul drainage system and conveyed to the below ground foul drainage system. This shall include (but is not limited to):

- WCs
- Wash Hand Basins (WHBs)
- Sinks
- Dishwashers
- Condensate and pressure relief valve discharge from mechanical plant (Electric water heaters, MVHR units etc.)

A trap shall be fitted to every appliance. Rodding eyes shall be provided to allow the whole system to be effectively rodded. In each vertical stack, provide access at each floor level (above the highest branch connection on that floor).

We understand existing drainage stacks run externally using cast iron pipework, these shall be retained and re-used where possible, as indicated on the accompanying drainage layouts.

Where new Soil Vent Pipes (SVP) are required to suit the new layouts, these shall be ventilated to atmosphere above the roofline where possible. If this is not possible due to the existing listed building fabric, stacks shall be ventilated via Automatic Air Admittance Valves (AAAVs) and concealed in an accessible boxing/services void.

A new surface water drainage system for the lower basement is proposed using a pumped sump to discharge surface water build-up in this area.

The new twin head surface water pumping station (such as a Delta Dual V3 sump pump or similar) shall be capable of providing min. 4m head and shall connect into the above ground drainage system at ground floor level. The pumping station shall be provided with battery back-up and high-level alarm facility. A new concrete chamber shall be provided to house the sump pump, please refer to the manufacturers recommended guidance on chamber depths and size.

A new high-level alarm facility shall be provided for pumping station and linked to the BMS.

16.3 Standards & Approach

The whole installation shall comply with:

- BS EN 12056
- Building Regulations Part H

Any external stacks or pipework requiring replacement shall be traditional cast iron with caulked joints to BS 416 painted black, to match the existing.

All internal waste branch pipework shall be uPVC or ABS with solvent welded joints and shall connect directly to the soil stacks. New internal Soil stacks shall be uPVC with solvent welded joints and expansion joints as recommended by the manufacturer.

External penetrations through the roof shall be fitted with a weather collar and flashing with stacks terminated using a cowl or similar.

Pipework shall be concealed wherever possible in plumbing ducts, boxing or behind IPS panelling.

Intumescent fire collars shall be provided where pipes pass through slabs or fire compartments.

17 Water Services

17.1 Scope

The scope of works includes the supply, installation, testing and commissioning of a new domestic hot- and cold-water services installation to serve all water outlets within the refurbished building.

17.2 Incoming Mains Water Supplies

The existing dia28mm incoming mains cold water service (MCWS) enters at the front of the Market Hall (currently within the Acc.WC). This shall be isolated, stripped out and replaced with a new dia50mm supply entering in the Sarah Harris Bar area.

Following discussions with Bristol Water (contact: Jake Brown, Newsupplies@bristolwater.co.uk, 0345 602 8022) we understand that the existing buried supply pipe is galvanised steel and therefore will be replaced and upgraded by Bristol Water free of charge up to the proposed meter location. The contractor shall be responsible for excavating and laying a new dia50mm blue MDPE supply downstream of the meter into the building. The contractor shall be responsible for liaising with Bristol Water to ensure there works in the street are coordinated into the main programme.

Please note that the new pipework has been sized based on a max flow rate of 1.1ltr/s to include the future extension requirements.

17.3 System Description

17.3.1 Mains Water Service

All the hot and cold general outlets within the building shall be mains fed, similar to the existing system.

The existing mains cold water service (MCWS) in Phase 1 areas shall be stripped out back to the incomer in the corner of the Market Hall and replaced with new.

New supply pipework shall be installed from the incomer to serve all new sanitaryware and re-connect into the existing pipework serving second floor WC areas etc. New connections include but are not limited to:

- WCs
- WHBs
- Sinks
- Urinals – via flow control device linked to PIR
- Dishwashers

The mains water service shall also re-feed the existing LTHW heating system via the existing packaged pressurisation unit in the SF plantroom.

17.3.2 CAT 5 Water Service

Not required – we understand that there are no external taps proposed as part of phase 1.

17.3.3 Domestic Hot Water

Domestic hot water shall be provided to WHB's and Sinks via local electric water storage heaters (such as Heatrae Sadia unvented Multipoint units or similar). The storage heaters shall be located within joinery cupboards adjacent to or below the outlets served in order to minimise hot water legs.

Local electric storage heaters are proposed instead of connecting back onto the existing hot water cylinder in order to allow for this to be removed as part of Phase 2 (i.e. when LT heat pumps are intended to be installed).

The electric water storage units shall be installed complete with the manufacturers unvented system kit (incl. expansion vessel etc.) and any safety valves required to form a working installation.

17.4 Standards & Approach

The whole installation shall comply with:

- BS EN 806 (Parts 1-5) Water Installations in Buildings
- BS 8558 Complementary Guidance to BS EN 806
- The Water Regulations
- The Water Bylaws of Thames Water

Pipework shall generally be copper to BS EN 1057 with press fit joints as the Yorkshire Xpress fit system or equal and approved in order to avoid the need for hot works.

HWS deadlegs shall not exceed 3m. Exposed final pipework shall be chrome plated.

All pipework shall be concealed within ceiling voids or services risers where possible.

Make good to maintain compartment integrity wherever services pass through fire compartment walls/ floors.

17.4.1 Valves

All appliances shall be fitted with local screwdriver operated isolation valves. Allow for all necessary valves and pipeline ancillaries to form a complete installation.

Provide drain valves at all low points to allow the whole system to be drained easily.

17.4.2 Insulation

All water services pipework (hot and cold) shall be insulated to BS 5422:2009 except for exposed final connections to appliances.

All valves 40mm or greater shall be insulated with valve jackets.

All pipework insulation shall be Kingspan Kooltherm pipe insulation with EMS certification e.g. ISO14001 phenolic foam snap-on pipe sections.

17.4.3 Chlorination

All water services systems shall be chlorinated to BS 8558 and samples laboratory tested and a certificate produced before handover.

17.4.4 Thermostatic Mixing Valves

All handwash basins shall be fitted with TMV3 compliant safety mixing valves to prevent scalding.

TMVs are not required to:

- Bar sinks
- Cleaner's sinks

Provide appropriate safety signage to these outlets

17.4.5 Water Conditioners

New electromagnetic water conditioners (such as Hydrotec HY-MAG or similar and approved) shall be installed on the incoming mains water pipework at point of entry.

Power supplies are required for these and shall be installed by the electrician.

17.4.6 Flow Restrictors

Cartridge type flow restrictors shall be installed on the hot and cold water feeds to:

- Wash hand basins
- Sinks
- WC's (these shall be dual flush)
- Urinals
- Showers

Refer to the drawings for details of required flow rates, refer to the Architects package for sanitary ware details.

17.4.7 Electric Trace Heating

Electric trace heating (as Raychem WinterGard FS or similar) shall be provided on all non-buried, pipework runs outside the heated envelope for frost protection.

Self-regulating trace heating (such as Raychem HWAT or similar) shall also be provided for temperature maintenance on all domestic hot water pipework runs over 3m.

17.4.8 Metering

A new utility meter shall be installed by Bristol Water in the roadside. The BMS shall include the facility for future private meter connections on the incoming water supply – refer to controls section.

18 Fire Suppression/ Dry Risers

No works proposed.

19 Gas Services

19.1 Scope

The scope of works includes the local modification of the existing gas pipework runs within the building in order to suit the new layout.

19.2 System Description

The existing U16 gas meter is located within the basement area. The gas pipework then rises from the basement within the existing Beauchamp room on the ground floor, runs at low level to the external wall and rises up to the plantroom on the second floor.

This supply shall be retained and locally modified to move the existing gas pipework running at low level within the Beauchamp room to high level, in order to allow for the new office layout.

New ventilated boxing shall be provided in order to conceal the internal pipework until it is stripped out as part of Phase 2.

19.3 Standards & Approach

The whole installation shall comply with BS EN 1775: 2007, the IGEM publication UP11 and the HSE approved Code of Practice.

All gas pipework shall be exposed or installed in ventilated voids. Gas works shall only be carried out by Gas Safe registered personnel.

20 Heating

20.1 Scope

The scope of works includes the supply, installation, testing and commissioning of a new Low Temperature Hot Water (LTHW) distribution system to serve all new heat emitters in refurbished areas as well as the existing retained radiators on the SF.

20.2 System Description

20.2.1 Main LTHW Heating system

The existing local radiators and heating pipework serving the refurbished phase 1 areas shall be stripped out back to the low loss header within the plantroom and replaced with new – please refer to the heating schematic for details.

The existing 90kW gas fired condensing boiler (Remeha Quinta Pro 90kW) shall be retained and re-used. This shall eventually be replaced with Air Source Heat Pumps

(ASHP) as part of phase 2, hence new pipework and equipment downstream of this must be sized based on lower LTHW flow and return temperatures.

The existing automatic pressurisation unit as Mikrofill 3 and expansion vessel in the attic shall be retained and re-used.

The existing Constant Temperature (CT) circuit shall be retained and re-used to feed the LTHW heating coil within the hot water calorifier.

A new variable temperature (VT) circuit shall be installed to provide heating to the building, using the existing connections onto the low loss header. Existing pipework serving the second-floor radiators shall be re-connected into the new system – **flow rates for the existing heating circuit must be recorded prior to decommissioning in order to ensure these are re-balanced at the end of the project.**

Please note that pipework will need be sized and selected based on flow rates required to achieve 10°C ΔT, in order to allow future integration of low temperature ASHP. Please refer to the mechanical equipment schedule for details.

The new ground floor and first floor heating circuits shall include 3-port thermostatic mixing valves linked to the BMS to maintain flow temperatures to these circuits at 55°C.

Dual-head variable speed pumps (such as Magna3 D range or similar and approved) shall be provided on the new heating circuits. These shall be linked to the BMS for speed control based on master thermostats within the floors served.

Existing pumps appear to still be in good condition; therefore, these are intended to be re-used on the primary circuit and the second-floor heating circuit – Please refer to heating plant schematic and mechanical plant schedule for details.

Controls for the LTHW heating system shall be provided by the BMS. Please refer to the controls section for further details.

Pipework shall generally be distributed around the building within ceiling and wall voids where possible. Where pipework is required to run within the existing floor structure, existing penetrations through the joists shall be re-used. If new penetrations are required, these shall be agreed with the design team prior to any works taking place.

Heat shall generally be delivered to the refurbished areas by means of underfloor heating. The underfloor heating system shall be designed and installed by a specialist such as Warmafloor (or equal and approved).

We understand a new beam and block floor is proposed on the ground floor with underfloor heating pipework run within the insulation layer. On the first floor, the suspended floor is retained, underfloor shall therefore run within the insulation between the joists. Please refer to the architect's package for final floor finishes and floor build-ups proposed.

Underfloor heating pipework shall be plastic PEX with an oxygen diffusion barrier, and laid on a layer of rigid board insulation as recommended by the underfloor heating specialist.

Underfloor heating water temperatures: 45°C flow, 35°C return.

Underfloor heating shall include a packaged controls system with room temperature sensors with local set-point adjusters within each zone. The system shall be enabled via the BMS, please refer to the controls section for further details.

Underfloor heating manifolds shall be supplied complete with;

- Mixing pump
- Three port control valve
- Air vents
- Regulating valves for balancing
- 2 port control valve for each outgoing heating circuit, connected to and controlled by;
- Local tamperproof room temperature sensors with set point adjusters (as indicated on the drawings)

In some locations (e.g. Market Hall) the underfloor heating shall be supplemented by Low temperature fan convectors as Jaga Strada DBE or similar and approved (pictured below). These shall be sized based on future circulation temperatures required for the ASHP's of 55/45°C. All fan convectors shall include Jaga Dynamic Boost Effect (DBE) technology in order to automatically maintain set outputs at varying flow and return temperatures using integral fans to boost airflow through the heat exchanger. Fan speed settings shall be linked to a thermostat within the space served.

Figure 1 Jaga Strada/Strada DBE fan convector

In some instances, fan convectors shall be concealed within perimeter boxing. Where this occurs, remote sensors as Jaga High level top valve with capillary tube shall be installed and fixed within the front face of the panelling to allow the sensors to read room temperature and allow for user adjustment. Concealed heat emitters shall also utilise decorative linear bar grilles installed in the boxing at the base and top to allow for air-circulation through to the unit, these shall be provided by the mechanical sub-contractor and are specified within the architect's package.

The contractor shall ensure that plug sockets are installed adjacent to all fan convectors in accessible locations and that units are provided with plug socket accessory.

Pipework shall generally be concealed in services voids, or boxed where services voids have not been provided.

20.3 Standards & Approach

The whole installation shall comply with BS 5440 and BS 6644.

Design temperatures:

- Winter external design temperature: -3°C
- Market Hall: 21°C
- Admin/offices/meeting: 21°C
- Reception area 21°C
- Corridors, toilets: 18°C
- Stores: 16°C

Please note that the LTHW heating system serving the phase 1 areas has been sized based on a 10°C ΔT in order to allow for the future addition of air-to-water heat pumps as the primary heat source.

20.3.1 Pipework

Main pipework shall be medium grade steel pipe to BS 1387 with screwed joints. Copper pipe is not considered to be suitably robust and shall not be used. Pipework shall be concealed wherever possible with exposed pipework limited to final connections to radiators. All heating and water services pipework shall be insulated to BS 5422 and all valves shall have fabric valve mate covers.

Connections to equipment or plant shall be compression joints.

Pipework shall generally be concealed within voids and perimeter boxing or boxed in where service voids have not been provided.

20.3.2 Insulation

All pipework shall be insulated, and foil wrapped to BS 5422 except for exposed final connections to appliances. All valves >32mm shall be insulated with valve mate fabric covers. Pipework in plantrooms shall be fitted with aluminium cladding for mechanical protection. Pipework in external areas shall be wrapped in a laminated cladding system (as 3M Ventureclad or similar approved).

Pipework insulation shall be pre-formed mineral wool sections with a factory applied aluminium foil facing.

20.3.3 Electric trace heating

Required on all, non-buried, external pipework runs and any non-buried pipework runs through un-heated spaces.

20.3.4 Valves

The system shall include all valves to form a complete system including isolation valves, regulating valves, differential pressure control valves, commissioning sets.

The installation shall include air vents at all high points and drain valves at all low points to allow the whole installation to be completely drained.

All heat emitters shall be equipped with TRV's and Lock Shield Valves (LSVs) for local balancing and isolation.

20.3.5 Pumps

All pumps shall be variable speed, inverter driven, selected from the Grundfos Magna range. Main circulation pumps shall be of twin head duty/ standby type with auto-changeover and load cycling facility.

Pumps to the ground and first floor heating circuits have been selected and commissioned based on system flow rates at 10°C ΔT, in order to allow future addition of ASHP's.

20.3.6 Flushing loops

Install in-line with flushing strategy. The LTHW distribution pipework shall be pressure tested in accordance with BSRIA / CIBSE guidance prior to concealment and thermal insulation being applied. The distribution pipework shall be cleaned and flushed thoroughly in accordance with BSRIA/CIBSE guidance and chemically treated to the boiler manufacturer's recommendations.

20.3.7 Cleaning and chemical treatment

The LTHW distribution pipework shall be pressure tested in accordance with BSRIA/CIBSE guidance prior to concealment and thermal insulation being applied. The distribution pipework shall be cleaned and flushed thoroughly in accordance with BSRIA/CIBSE guidance and chemically treated with corrosion inhibitor to the heat pump manufacturer's recommendations.

21 Mechanical Cooling

21.1 Scope

No new works proposed.

Existing split unit serving Sarah Anne Room to be stripped out and disposed of.

22 Ventilation

22.1 Scope

Supply, install, test, commission and set to work new mechanical ventilation systems for the Market Hall, office space, meeting rooms and new WC areas.

22.2 System Description

22.2.1 Market Hall

The Market Hall shall be mechanical ventilated via a new mechanical ventilation and heat recovery (MVHR) unit installed within the attic space.

In order to avoid creating new openings in the listed building façade or roof to install the unit, the installation must be completed using the existing access routes available. We understand Farmwood M&E Ltd (contact: Aaron Atkinson, aaron@farmwood.co.uk) are able to offer a service whereby they deliver the unit in sections and re-assemble/re-commission it on site. A quotation for this service has been developed within Farmwood. The contractor shall be responsible for progressing this quotation unless they are able to find an alternative method of installing the unit in one piece.

The unit shall include;

- Double skinned galvanised steel casing
- Supply filter and extract filter – side access
- Counter flow heat exchanger
- Electric heater battery (generally tempering fresh air)
- Variable speed supply and extract fans
- Face and bypass dampers
- Attenuators
- Drain pan and condensate pump
- Anti-vibration mounting
- Packaged controls linked to a C02 sensor and manual switch within the Market Hall and to BMS for enable/ fault:
    - Unit to run at trickle speed (say, 50% of design flow) based on enable signal from BMS, boost triggered based on activation of switch or C02 sensor with Market Hall
    - Automatic operation of heater battery to maintain minimum supply temperature set-point [16°C] adjustable.

- Automatic control of bypass damper to provide free cooling when required and available
- Fan failure and filter monitoring by pressure switches
- Condensation pump interlock and alarm

Access doors to the attic void shall be enlarged to allow access for maintenance and filter replacement of the MVHR unit.

The units shall be variable speed with the maximum motor speed set at commissioning stage to ensure the unit meets the required air volume duty.

Air shall be delivered to and extracted from the Market Hall via grilles located within the ceiling. These shall be separated as much as possible to ensure air-circulation through the room.

Exhaust and intake shall be via weatherproof cowls installed through the existing roof. Finish to be painted to match slate roof colour.

22.2.2 FF meeting rooms, GF office and WC areas

A new local mechanical ventilation and heat recovery unit shall be installed within the attic to provide supply air to the offices/meeting rooms and extract air from the WC's.

The unit shall include:

- Supply filter and extract filter
- Counter flow heat exchanger – to ensure no crossover of air paths
- Variable speed supply and extract fans
- Face and bypass dampers
- Attenuators
- Drain pan and condensate pump
- Anti-vibration mounting
- Packaged controls linked to a CO2 sensor/boost switch in office and PIR's in the WC areas and meeting rooms for boost control. Relay module to be provided in order to allow multiple switches to control the same unit. Unit to run continuously at 50% design flow rate otherwise.
- Links to BMS for fault monitoring and fire alarm shutdown

Access shall be provided to the attic space for future maintenance and filter replacement on the MVHR unit.

Cross talk attenuators shall be installed on supply ducts between meeting rooms to ensure no noise transfer via the ducts.

Fire rated transfer grilles with intumescent cores shall be installed within meeting room doors to ensure air circulation through the space.

Exhaust and intake shall be via weatherproof cowls installed through the existing roof. Finish to be painted to match slate roof colour.

22.2.3 Plant room

The existing plantroom is ventilated via 3no. passive ducts installed within the ceiling and run through the attic to roof cowls. These shall be retained where possible. It is likely that the duct in the centre of the attic space will need to be removed to allow space for the new MVHR unit. For tendering purposes, allow for the central passive duct to be stripped out and the duct above the DHW cylinder to be increased to dia250mm to account for the free area lost.

Make-up air shall also be maintained to basement storeroom as this contains natural gas equipment and exposed gas pipework. Please refer to the ventilation layout for details.

22.3 Standards & Approach

- Building Regulations Part F
- Building Regulations Part L

22.3.1 Ductwork

All ductwork shall be manufactured, installed and pressure tested in accordance with DW 144 c/w access panels, leakage tested and cleaned to TR19.

All ductwork shall be galvanised using spirally wound or rectangular sections, fabricated to suit the specific requirements of the system.

22.3.2 Ductwork velocities

The ventilation systems shall operate at a maximum velocity as follows:

- Main runs: 4m/s
- Branch ducts: 2.5m/s

22.3.3 Attenuators

Matched acoustic primary attenuators shall be provided on both sides (i.e. room side and atmospheric side) of all ducted fans.

22.3.4 Grilles & louvres

Refer to drawings and schedules

22.3.5 Fans

All fans shall be EC, variable speed, inverter driven, installed on anti-vibration mounts.

22.3.6 Fire dampers & intumescent grilles

Where ductwork passes through fire rated walls, floors or cavity barrier, the ductwork shall include a fusible link operated fire damper, complete with access door. Where grilles are located on fire compartment walls or fire doors, fire compartmentalisation shall be maintained to the structure with the provision of intumescent seals or fire dampers.

22.3.7 Flexible ductwork connections to grilles

Acceptable only on final 300mm to grille.

22.3.8 Insulation

All ductwork shall be insulated and foil wrapped to BS 5422 and concealed within ceilings or boxings.

All ductwork insulation shall be Kingspan with EMS certification e.g. ISO14001 phenolic foam snap-on pipe sections.

23 Central Controls

23.1 Scope

Design, supply, install, test, commission and set to work a complete new Trend BMS based automatic controls installation to power and control new main building services plant and retain meter readings for all new sub-meters.

We understand that the existing control panel is not maintained and has no record information available; therefore, for tendering purposes, the contractor shall allow for a new BMC control panel.

Existing controls and panels to be stripped out and replaced with new.

23.2 System Description

23.2.1 New local mechanical control panel

A new sheet steel control panel shall be provided within the plantroom. This panel shall include both control and power sections;

The power section shall supply all new central mechanical equipment. The controls specialist shall be responsible for the design of power supplies to this mechanical plant.

The control section shall include a BMS outstation as the Trend IQ4 system. The specialist shall be responsible for the design of all field wiring and the selection of control valves and sensors.

Provide a 7" touchscreen interface on the panel for local control from the panel. Provide a data point, network switch etc. as required to allow remote monitoring and control via the client's network.

Manual "on/off/auto" switches and indicator lamps mounted on the panel facia shall also be provided for all equipment in order to facilitate commissioning, testing etc.

The BMS shall include a link to the fire alarm system to ensure that plant is shut-down and gas solenoid valves closed in the event of an alarm.

In addition to this, the BMS shall control or monitor the following equipment:

- LTHW heating system (Power, control & fault) incl. underfloor heating system
- Domestic Hot Water system (Power, control & fault)
- Heating pressurisation unit (Power & fault – local packaged controls)
- MVHR units serving Market Hall and office areas (Time scheduling and Fault – local packaged controls)
- Boiler room gas solenoid (Power, control & fault)
- New gas, water and electricity meters (Monitoring)
- Fire alarm (interface for automatic operation of services plant on fire alarm event)

23.2.2 Link to fire alarm system

The MCP shall be linked to the fire alarm system (hard wired link). A fire signal shall:

- Close gas solenoid valve
- Turn off MVHR units and close dampers

The system shall automatically reset when the fire signal ends i.e. manual reset of equipment is not required.

23.2.3 Spare capacity

The MCP shall include spare capacity for power and control of the items below (to be installed as part of phase 2):

- Air Source Heat Pumps (Power, control and fault)
- MVHR unit for Assembly Room (Power, control and fault)
- A/C split unit for computer room (Power and fault – local packaged controls)

23.2.4 LTHW heating system controls

Provide a complete heating control system with:

LTHW Heating System:

- Optimum start
- Weather compensation on VT circuits
- Separate control of 2No. heating circuits
- 7-day time clock control for each zone
- Easy to operate heating override facilities (override on and override off)
- Control of 3-port mixing valve on VT circuit based on flow temperature sensor (maintain flow at [55°C])
- Automatic changeover and duty rotation of all twin head pumps
- Enable signal to underfloor heating system wiring centres
- Night setback
- 2-stage frost protection
- Holiday routine which turns heating to frost protection only
- All necessary safety interlock devices
- Weekly run routine for each of the gas boilers and pumps (to ensure that they are occasionally enabled)
- Automatic shut-down on fire alarm

23.2.5 Domestic hot water system controls

The existing calorifier shall be connected back to the central BMS which shall provide;

- HWS primary circuit to be enabled by programmable 7-day timeclock
- HWS return pump to be enabled when calorifier is enabled
- Fault monitoring of calorifier by BMS
- Temperature sensors on DHW flow pipework

23.2.6 MVHR units (Market Hall & Office areas)

The unit shall be supplied with the manufacturer's own integral controls, as described in the ventilation section.

The unit shall also be connected back to the central BMS which shall provide;

- Time schedule control (365 day programmable)
- Fault reporting
- Maintenance reporting (e.g. filter change, based on hours run)
- Fire alarm shut-down signal

23.2.7 Fault Monitoring

The BMS shall include fault monitoring for all main equipment, including (but not necessarily limited to):

- Pressurisation set
- LTHW system (boilers, pumps/ flow switches etc.)
- DHW systems (calorifier temperature, pumps/ flow switches etc.)
- Ventilation systems (MHVR units)
- Pumping station in basement

23.2.8 Metering

Link to all meters to provide monitoring to meet Building Regulations Part L requirements. Meters include:

- Electricity sub-meters
- Water sub-meter

23.3 Standards & Approach

Trend IQ4 Building & Energy Management System (BMS).

Open protocol system.

The whole of the Contract installation works shall be carried out strictly in accordance with:

- BS 5839 Fire detection and fire alarm systems for buildings
- BS 7671 Requirements for electrical installations (IEE wiring regulations)
- BS 7799 Parts 1 & 2 Code of Practice for Information Security Management
- BS 7807 Code of Practice for design, installation and servicing of integrated systems incorporating fire detection and alarms systems and/or other security systems for buildings.
- BS EN 50081-1 Generic emission standard
- BS EN 50082 Parts 1 & 2 Generic immunity standard
- BS EN 50174 Information technology - cabling installation
- BS EN 60439-1 Low-voltage switchgear and control assemblies
- BS EN 60529 Degrees of protection provided by enclosures
- EN ISO 16484-5 Building automation and control systems - Part 5: Data communication protocol
- BSRIA Application Guide AG 7 Library of Control Strategies
- BSRIA Application Guide AG 9 Standard Specifications for BMS
- CIBSE guide H Building Control System
- CIBSE Commissioning Code C Automatic Control
- EC Directives:
    - Low Voltage Directive 73/23/EEC and amendment 93/68/EEC
    - Construction Products Directive 89/106/EEC
    - General Product Safety Directive 92/59/EEC
    - Electromagnetic Compatibility (EMC) Directive 89/336/EEC
- Building Regulations Part L, including Non-Domestic Building Services Compliance Guide

23.3.1 Wiring

Generally wiring shall comprise of wiring to the same standard as specified for the low voltage distribution system:

- Wiring within plant rooms: single core cables in galvanised steel conduit and trunking

- Field wiring outside plant rooms: LSF sheathed cables run on cable tray or trunking or in galvanised steel conduit.

23.3.2 User Instruction and Follow Ups

Allow sufficient time for training users.

23.3.3 Power Loss and Restoration of Power

Under loss of power condition all plant shall stop but shall resume normal operation whether under standby power generation or normal mains power supply. During commissioning a simulated test shall be carried out. No manual intervention shall be necessary to restart the plant or reset controls.

24 Low Voltage Distribution

24.1 Scope

Supply, install, test, commission and set to work complete new low voltage electrical distribution system.

Existing Low Voltage electrical distribution infrastructure within the remodelled building will be stripped out and replaced to suit the new layouts.

24.2 Incoming electricity supply

The existing 100A TPN supply is located within a cupboard at the front reception area of the building. This is not sufficient to cater for the proposed Phase 1 and 2 loads (ASHP's, water heaters, heater batteries etc.) and therefore shall be upgraded to a new 150A TPN supply with WPD.

The new supply cut-out and meter shall enter in the cupboard space at the top of the access stairs to the basement.

A quotation for the works required has been developed with WPD (ref: 4189211). The contractor shall be responsible for progressing this quotation and liaising with WPD as required to plan their works into the main programme.

Please refer to electrical schematic for details.

24.3 System Description

24.3.1 Electrical Distribution System

A new 250A TPN MCCB panel board (as Schneider Powerpact or similar and approved) shall be installed within the same cupboard as the WPD cut-out.

Supplies shall be taken off the new panel board to feed a new distribution board on the ground floor as well as temporarily re-supplying the existing distribution board (DB 03) serving the second-floor area. Supplies shall also be provided for the fire alarm panel, intruder alarm panel and lift directly off the new panel board.

The existing distribution board (DB 03) serving the second-floor area is currently located within a cupboard on the first floor due to be demolished. This will need to be moved up to the second floor and existing cabling traced to confirm available locations for the board.

Also, the existing power supply and isolator for the lift is currently located within the GF electrical cupboard, this will need to be relocated as part of the project to the basement area.

New submains shall be run within voids where possible.

The new GF distribution board shall be split metered type (as Schneider Acti 9 series or similar and approved) to allow power consumption for lighting and small power to be separately monitored, as per Part L requirements. Larger items of plant (e.g. MCP, any large fans etc.) shall also be separately sub-metered in line with the recommendations of Part L.

Submeters will be connected back to the BMS to allow central monitoring and recording.

Sub-mains shall be XLPE insulated LSF sheathed SWA cables run on cable tray.

Allow for minimum 20% spare capacity in all panel boards and distribution boards.

24.3.2 Small Power System

The new small power system shall be fed from the local MCB distribution boards. Number of outlets required is shown on the layouts.

The small power installation shall include:

- 13A socket outlets in walls
- 13A sockets located within floor boxes in the Market Hall
- 13A sockets for fan convectors
- 13A cleaner's sockets
- 16A commando outlet for new data cabinet located within the office area
- 13A sockets for printers and any other office equipment
- Power supplies to basement pumping station (size of supply TBC by pumping specialist)
- Power supplied to power assisted doors
- Switch and un-switched fused connection units for fixed equipment (door hold open devices, fire alarm interface units, hearing aid induction loops, intruder alarm and CCTV equipment etc.)
- Power supply to new controls equipment

24.3.3 Wiring system

Sub-mains cables shall be XLPE insulated LSF sheathed armoured cables and laid on galvanised steel cable tray or direct buried in the ground.

Local sub-circuits shall be XLPE insulated LSF sheathed 2-core + earth cables, concealed in ceiling or wall finishes.

Local sub-circuits in plant room shall be single core XLPE insulated cables in galvanised steel trunking or conduit.

All wiring shall be concealed and all outlets flush-mounted except for outlets in plant areas

Ensure 2-core + earth cables in ceilings are fixed with metal fixings so that they meet the IET requirements for cables in fires escape routes.

Final connection to internal single phase 230V fixed appliances shall use flexible cord from fused connection units.

Weatherproof flexible conduit shall be used for final connection to external plant or equipment or three phase equipment.

All secondary containment required (beyond that indicated on the layout drawings) shall be allowed for and provided.

24.3.4 Floor Boxes

Floor boxes shall be required within the Market Hall in order to provide power to the proposed display cabinet locations.

Floor boxes shall be 3 compartment and mounted within the proposed screed flooring with cast-in metal ducting installed between each floor box for cabling routing (such as MK Cablelink Plus Screed system). Floor boxes to be flush with finished floor, contractor shall confirm depth required based on the finished floor requirements.

24.3.5 External sockets

None proposed

24.3.6 Local Isolators

Local isolators shall be provided for all equipment and plant for maintenance.

24.3.7 Electric trace heating

Electric trace heating shall be provided for all above ground pipework which runs through unheated voids.

24.3.8 Supplies to power assisted doors & door hold opening devices

Required for the Market Hall entrance/exit doors. Contractor to provide power and cabling to actuators.

24.3.9 Supplies to roller shutters

None proposed.

24.4 Standards & Approach

The whole installation shall comply with BS 7671 IET wiring regulations, 18th Edition.

Sub-mains cables shall generally be LSF insulated and sheathed SWA cables run on galvanised cable trays.

Final wiring will generally be in LSF insulated and sheathed 2 core + Earth cabling running in basket where more than 10 cables run in parallel and supported at minimum 300mm centres with metallic banding or tower clips elsewhere.

Principal electrical containment shall be concealed throughout.

New electrical accessories (sockets/ switches etc.) shall be flush mounted.

Distribution Boards: Schneider.

Floor boxes shall be multiple compartment cavity floor type (such as Cable duct – 700 series or similar). These shall be sized according to outlet requirements and provided with all accessory plates and outlets indicated on the small power and data plans. To be ordered with antique brass finish flat lids.

Containment with additional draw wires shall be provided between floor boxes and screen locations in meeting rooms for cabling connections between the two points.

Combined MCB/RCDs (RCBOs) shall be provided to all circuits with 30mA earth leakage setting and overload setting as MCB rating. RCD's serving more than a single outgoing way will not be acceptable.

A maximum of 16No. single socket outlets per final circuit (in order to prevent nuisance tripping from RCDs).

Ensure a minimum separation of 200mm between parallel data and unscreened power cables to prevent electromagnetic interference.

Devices shall be single module wide and fitted within distribution boards and be manufactured by the same manufacturer as the main switchgear. All sub-mains shall include a separate CPC run in parallel with the main cable, and final sub-circuits shall include a separate RCD's and CPC run in the trunking or conduit with the circuit cables sized in accordance with the 18th edition IET Regulations.

Provide all supplementary earth bonding in accordance with the IET Regulations, including bonds to extraneous metalwork as required.

Mini-trunking shall not be used.

24.4.1 Energy metering

New Distribution Boards shall be of split-metered type (as the Schneider Acti 9 Split metered range) with separately sub-metered small power and lighting sections. These submeters shall be connected back to the new BMS system for monitoring.

24.4.2 Cleaner's sockets

Required, as indicated on the drawings and fed from separate circuits to general small power to prevent nuisance tripping. Cleaner's sockets to be provided from MK Logic plus range with red rocker switches to distinguish sockets.

24.4.3 Hand dryers

Power required for hand dryers in WC's.

24.4.4 Labelling

All outlets and electrical equipment shall be labelled.

All wiring accessories/outlets will be labelled with circuit references on the faceplate.

All fused connection units must indicate which appliance they serve.

24.4.5 Controls and plant wiring

All wiring, power points and interfaces for meters, control panels, sensors, valves and mechanical plant shall be installed and set to work. The electrical sub-contractor shall wire all of the power and field control wiring for all systems, based on design drawings provided by the Controls specialist.

24.4.6 Buried ducting

All buried ducting for LV submains shall be Ø150mm Rigiduct twin wall cable ducting c/w draw wires and market tape. Please refer to typical buried services detail for required depth of ducting.

All buried ducting shall be supplied and installed by the main contractor.

25 Lighting

25.1 Scope

Supply, install, test, commission and set to work complete new lighting installation with automatic lighting controls (internal, external and emergency).

25.2 System Description

25.2.1 General lighting

Lighting within the existing building shall be stripped out and replaced in the refurbished areas to suit the new layouts. Existing lighting on the second floor shall be retained.

New high efficiency LED lighting shall be provided throughout for the proposed scheme.

Please refer to the layouts and luminaire schedule for proposed fittings.

New suspended linear track fittings with direct and indirect lighting shall be installed within the Market Hall, as OptaLED Icon 50 or similar and approved (image below).

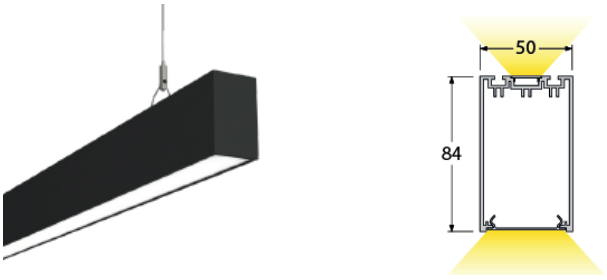

Figure 2 OptaLED Icon 50 light fitting

The suspended linear track system shall be continuous with illuminated corner sections in order to limit cable drops from the ceiling. Suspension points on the fittings are adjustable in order to align with existing ceiling beam positions.

The direct element of the fittings shall be DALI dimmable. The indirect element (i.e. uplight) of the fitting shall be switched via standard on/off rocker switches located adjacent to the dimmer switches.

Drivers shall be located within an accessible location adjacent to cable drop positions, located above the ceiling void with accessible hatches.

Suspension wires are adjustable along the track and shall therefore be aligned with existing ceiling beam locations.

Feature lighting shall also be provided for the new entrance lobby using suspended tubular fittings fixed to existing beams.

Areas with new suspended ceilings (WC areas etc.) shall be provided with recessed downlights.

Stairwells shall be lit via surface mounted bulkhead fittings with integral emergencies.

Plantrooms and cupboards shall be lit by basic IP65 rated fittings, co-ordinated with high level pipework to provide lighting to all equipment.

25.2.2 Lighting Controls

All public areas such as the Market Hall shall be manually dimmable.

Presence detection shall be provided in all areas of transient occupancy such as; WCs, corridors and storage spaces (i.e. auto on, auto off after a pre-set period with no movement detected). This shall allow lighting to be switched off automatically when no movement is detected after a pre-set period (initially set to 20 minutes).

Automatic daylight compensated dimming will also be provided in all spaces with good natural light.

External lighting shall be controlled by means of a photocell and timeclock in series, such that this does not run when daylight is available and shall be switched off automatically in the late night/early morning period.

25.2.3 Emergency Lighting

New emergency lighting shall be provided to meet the requirements of BS 5266.

Emergency lighting shall be provided in accordance with BS 5622 and will generally be delivered via emergency conversions of the luminaires used for general lighting with integral 3-hour battery packs.

Externally, emergency lighting shall be provided adjacent to all final exit doors using wall mounted cylindrical fittings with remote emergency battery packs.

Illuminated exit signs shall be provided along escape routes in accordance with the fire escape strategy for the building.

<u>Self-Testing</u>

All new stand-alone emergency luminaires shall be fitted with a self-test module.

Identification and Labelling

Each self-contained emergency lighting luminaire shall incorporate an automatic test module and LED status indicator. Every converted emergency luminaire shall incorporate an LED indicator to identify it as an emergency luminaire.

25.2.4 External lighting

All external lighting shall be fed from the plantroom distribution board and switched via timeclock and photocell in series with manual override switch located adjacent to distribution board.

Please refer to the lighting layouts and luminaire schedule for fitting details and locations.

25.3 Standards & Approach

The lighting installation shall comply with the SLL Code for Lighting and BS 7671.

Proposed target illuminance levels;

- Offices: 500 lux at desk height with a minimum uniformity of 0.6
- Market Hall: 200 lux at floor height for general circulation with a minimum uniformity of 0.6
- Circulation areas/ WCs: 100-200 lux at floor level with a minimum uniformity of 0.4
- Plantrooms: 200 lux at floor level with a minimum uniformity of 0.6

Emergency lighting shall comply with CIBSE lighting Guide LG12 and BS 5266.

All new luminaires shall have a colour temperature of 4000K (cool white)

All lamps shall be of LED type and shall achieve a minimum luminous efficacy of not less than 60 luminaire lumens/circuit watt.

26 Data and Telephony Installation

26.1 Scope

Supply, install, test, commission and set to work new Category 6 structured wiring system.

Passive equipment (cabling, patch panels, cabinet and power supplies) will be provided as part of the contract works.

Active equipment (switches, servers, wireless access points, smartboards etc.) will be procured directly by the client's existing IT specialist.

Existing local data wiring within the building shall be stripped out and replaced to suit the new layouts.

Please refer to the small power and data layouts for proposed outlet locations.

We understand that there are currently two separate IT networks serving the offices on the ground floor, with incoming lines entering above the entrance off Silver Street and tracking across the building within the ceiling void.

- 1no. for Town Council managed by SoVision (contact: Terry Crichan, SoVision, 0117 986 4026, terry.crichan@sovisionit.com) – server located within the GF office cabinet
- 1no. for BPB Accounting managed by Soltech

Both servers shall be moved into the main IT cabinet as part of the contract works.

26.2 System Description

26.2.1 New IT racks and links to existing network

A new 39U 600x800mm floor mounted IT cabinet shall be provided in the GF office. This shall be provided with patch panels as required to cater for all new data outlets installed throughout the building. Existing incoming BT Openreach and Virgin Media lines shall be re-routed to enter at the cabinet location.

The new rack shall include:

- Steel frame
- Patch panels

- Ventilated top
- Removable side panels
- Lockable glass front door
- Natural ventilation and fan tray for optional fan
- Cable supports
- Earthing lugs
- Multi-gang power distribution bar with 6 x 13A socket outlets within the cabinet and wired to the electrical supply via a BS EN 60309 socket outlet on a 16A radial circuit

Leave 1U spare under between each patch panel for patch connections.

The new cabinet shall be re-connected to the clients chosen network. The contractor shall be responsible for liaising with the clients IT specialist to arrange this.

26.2.2 Data outlets

A new Category 6 structured wiring installation shall be provided throughout.

New RJ45 outlets shall be provided as indicated on the drawings. These shall generally include:

- RJ45 outlets generally spread around Market Hall, Offices, counselling rooms and reception area (telephones are assumed to be Voice Over IP (VOIP) via the data network) – Outlets within the Market Hall will be required for remote video
- High level outlets for new Wireless Access Points
- High level outlets for new CCTV cameras (internal and external)
- High level outlets for projector in Market Hall
- Low level outlets for networked cash tills in Sarah Anne Bar
- Access controlled doors
- Fire alarm panel
- Security panel
- Adjacent to MCP for remote monitoring
- Adjacent to lift, as per manufacturer's recommendations, replace existing data outlet in basement with new.

Provide grey plastic MK Logic Plus Euro-module faceplates with white RJ45 Cat 6 sockets (to match other electrical accessories) for all general outlets.

Provide white plastic MK Logic Plus Euro-module faceplates with White RJ45 Cat 6 sockets for all outlets at high level (e.g. WAP points etc.).

All telephone and data services shall be run over the structured wiring system meaning that any data point can be patched as either a data or a telephone point.

26.2.3 Labelling and records

Each outlet shall be uniquely numbered and labelled with the number. The patch panels shall be numbered with the same numbers.

Provide record drawings and a schedule of outlets listing each outlet, its reference number and its location.

26.3 Standards & Approach

New installation to be Category 6 compliant to BS 6701 and conforming to the following:

- Protocol: 1000BASE-T
- Standard: IEEE802.3ab
- Data rate: 1Gb/s 250Hz
- Distance: 100m
- Ratification: ADC Krone
- Warranty: 25 years

Data cables shall run on separate galvanised steel basket, concealed within perimeter boxing and ceilings. Ensure a minimum separation of 200mm between parallel data and unscreened power cables to prevent electromagnetic interference. Allow at least 40% spare capacity after all the cables have been installed, for future provision.

Each outlet shall be uniquely numbered and the number clearly marked on the outlet faceplates and on the patch panel.

Fire propagation of cable sheaths shall be to a minimum C_{ca} standard to BS EN 13501-6

27 Television Aerial and Audio-Visual Installation

27.1 Scope

Design, supply, install, test, commission and set to work infrastructure to support a new Audio-Visual system for the Market Hall and Office area.

The contractor shall provide and install all passive infrastructure (incl. AV plates, cabling, trunking etc.) as part of the contract works. The client will provide all of the AV equipment (e.g. projector, screens etc.) free issue for contractor to install.

27.2 System Description

New cabling infrastructure (incl. AV plates, trunking etc.) shall be provided as part of the contract to support new Audio-Visual equipment in the Market Hall and Office area.

The exact brief for the AV installation has not yet been confirmed by the client. This will need to be developed further during the construction stage. For tendering purposes, please assume the following:

In the Market Hall, the AV installation is likely to include:

- Retractable Screen and ceiling suspended projector, location as per architectural layouts
- Speaker outlets in each corner of the room
- Fixed hearing aid induction loop to cover full space and bar area (separate channels)
- Radio microphone system to allow speaker to move around the room while presenting
- Fixed AV connection points for a laptop or similar adjacent to Bar area.
- Data connections at either end to facilitate remote broadcasting of events within hall space

Numbers and indicative layout of the power, data points and containment required to support this AV equipment is given on the accompanying small power and data drawings, but the specialist shall provide final setting out for conduits, trunkings etc. to suit the equipment.

Main equipment (amplifiers, radio microphone receivers etc.) will be located in the store area within the Sarah Harris Bar.

In the GF office area, the AV installation is likely to include:

- Wall mounted LED screen linked to AV plate with VGA, HDMI, Audio and RJ45 outlet connections

27.2.1 IRS system

We understand that the existing IRS system is provided via a satellite dish and aerial located on an adjacent property. As part of the contract works the contractor shall relocate the aerial and dish onto the roof space of the Market Hall building and provide a new cable connection between the aerial and the new IT cabinet on the GF.

Internally, new coaxial cabling shall be provided to connect the new TV screen within the GF office area, outlets within Market Hall and any existing connections on the second floor.

27.3 Standards & Approach

Data cabling shall comply with BS 6701 and be wired with Category 6A STP copper network cables.

Face-plates: MK logic plus range generally in contrasting colours

28 Sound Amplification

28.1 Scope

Design, supply, install, test, commission and set to work a new hearing aid induction loop system for the Market Hall, Reception and Sarah Harris Bar.

28.2 System Description

Provide new specialist designed fixed hearing aid induction loop systems to cover;

- Sarah Harris Bar servery counter
- Market Hall
- Reception desk

The system shall include 3 separate loops one for each space.

The systems shall be minimal spill systems.

Each system to include clip on rechargeable microphone, induction loop tester, loop amplifier, tie microphone system with charging stand, aerial cables, audio and visual connection points to allow connection with client AV equipment and all necessary equipment to form a complete installation.

All other sound amplification equipment shall be provided by the Client post contract.

28.3 Standards & Approach

Multiple loop system compliant with BS EN 60118-4

29 CCTV

29.1 Scope

Design, supply, install, test, commission and set to work a complete new CCTV system.

We understand that the client's existing maintainer for all CCTV systems on the site is Apollo Technology. A quotation for the works has been developed with Apollo Technology (contact: Nick Creed, email: NickCreed@apollotechnology.co.uk). The contractor shall contact Apollo Technology directly and be responsible for progressing this quotation.

29.2 System Description

The existing CCTV system shall be stripped out and replaced with new.

Internal cameras: high resolution fixed dome cameras shall be positioned internally to cover the main entrance area and the reception desk.

External IP rated dome type CCTV cameras with day/night mode and anti-condensation frost heater shall be provided to give general surveillance of the external facades and entrances – please refer to the fire alarm and security layout for camera locations.

New cameras shall be cabled back to a DVR/NVR located within the new IT cabinet over a dedicated cabling infrastructure for recording (to be confirmed by specialist).

Playback data shall connect back to a new monitor located within the town council's management office over the client's data network. The contractor shall liaise with the Client's IT team to obtain a suitable IP address etc.

29.3 Standards & Approach

Designed and installed to BS 79858:2015.

The Digital Recorder (DVR) shall include storage sized to record for at least 30 days with all cameras having a frame rate of no less than 25 frames per second at 1080p.

30 Electronic Access Control

30.1 Scope

Design, supply, install, test, commission and set to work a new electronic access control system for the main entrance door.

A quotation for the works has been developed with Apex Alarms (contact: Richard Hill, email: Richard@apexalarms.co.uk, tel: 01761 412222). The contractor shall contact Apex alarms directly and be responsible for progressing the quotation.

30.2 System Description

Scheme intent for the doors to be controlled is indicated on the drawings. Detailed design of door controllers, wiring etc. shall be completed by an access control specialist.

Locking shall be provided by means of heavy-duty magnetic locks in order to provide good resistance to forced entry, with a proximity fob/ card reader externally and a push to exit button and green break glass unit internally.

Externally, access shall be controlled by means of a code keypad

Internally, access shall be controlled by means of a push to exit button and a green break-glass unit to locally cut power to the magnetic lock in the event of a power failure.

The above items shall be connected to a door controller located adjacent to the main entrance door.

The door controller shall be connected to the buildings IT network to allow this to be monitored and programmed remotely.

30.3 Standards & Approach

- BS EN 60839

Paxton system or equal and approved

31 Security Alarm and Detection

31.1 Scope

Design, supply, install, test, commission and set to work a new intruder alarm system for the refurbished areas.

A quotation for the works has been developed with Apex Alarms (contact: Richard Hill, email: Richard@apexalarms.co.uk, tel: 01761 412222). The contractor shall contact Apex alarms directly and be responsible for progressing the quotation.

31.2 System Description

The system shall be controlled by a central panel indicated on the drawings with keypads and LCD displays (locations as indicated on the drawings) for staff to set and unset the system.

The system shall include an integral 24-hour battery back-up.

External sounder/bell box shall be provided linked to the buildings alarm system.

Internal/external alarm sounders shall be of high output, distinct from other alarms and complete with high visibility flashing xenon beacon. Sounders shall incorporate a tamper device to prevent unauthorised access.

31.2.1 External Doors

All external doors shall be fitted with magnetic door contacts. For double doors, detectors shall be installed on both door leaves.

31.2.2 Room and Circulation Areas

All GF areas shall be fitted with dual-technology detectors to adequately cover rooms and circulation areas and prevent intruders moving undetected through the building – detectors shall be wall or ceiling mounted.

Detectors shall be provided to all rooms with windows or doors and circulation spaces.

31.2.3 Zoning

Allow for four separate zones (with separate keypads) which can both be set/unset from any keypad.

- Zone 1 – GF Reception area, GF office and FF areas
- Zone 2 – Market Hall & Sarah Harris Bar
- Zone 3 – SF area (including Assembly Room)
- Zone 4 – Spare zone for future expansion

System to be fully addressable with capability of future re-programming of zones and zone boundaries if required.

Keypads shall be provided for system set/ disarm at the main entrances to each zone.

31.2.4 Wiring

All wiring shall be concealed and run on cable tray or in painted steel conduit. Do not install unprotected surface mounted cable.

31.2.5 External Monitoring

The new intruder alarm shall be linked to a remote dial-out facility – client to confirm emergency contact details.

31.3 Standards & Approach

Intruder alarm to BS 4737

All wiring shall be concealed in voids or chased into walls wherever possible, however, there are some areas in which containment for main groups of cables will be exposed.

Wherever exposed, containment shall be carefully coordinated with other services and set out as agreed with the architect. A high level of workmanship will be required and expected.

Integral 24hr battery back-up shall be provided.

32 Fire Alarm

32.1 Scope

Design, supply, install, test, commission and set to work a new fire alarm system to cover the refurbished areas.

A quotation for the works has been developed with Apex Alarms (contact: Richard Hill, email: Richard@apexalarms.co.uk, tel: 01761 412222). The contractor shall contact Apex alarms directly and be responsible for progressing the quotation.

32.2 System Description

The existing main fire alarm panel shall be stripped out and replaced with new. All wiring and detectors downstream of this shall be stripped out and replaced with new to suit the new building layout except for detectors serving the second floor area. Second floor detectors shall be re-wired back into the new panel.

Smoke and/or heat detectors shall be provided to all the areas required by BS 5839 for a category L2 system, this shall include; corridors, all spaces opening onto escape routes and high-risk areas (e.g. Plantroom, kitchen etc.).

Detectors shall be provided in voids larger than 800mm high, including the attic roof spaces with links to remote indicators.

Combined detectors and sounders with integral flashing beacons shall be used throughout.

Manual call points shall be provided as required by BS 5839 (e.g. by all final exit doors, stair landings etc.)

An external sounder with flashing beacon shall be provided on the external façade of the building.

The new fire alarm panel shall include a digital communicator to allow external communication and a battery to provide 24 hours back-up in the event of mains power failure.

32.2.1 Fire alarm links/interfaces

The following M&E plant shall have links to the fire alarm system:

- Mechanical control panel (BMS)
- Gas boilers (shut down in event of fire alarm activation – via the BMS)
- Gas solenoid shut-off valves (shut down in event of fire alarm activation – via the BMS)
- MVHR units (shut down in event of fire alarm activation – via the BMS)
- All power assisted doors (release in event of fire alarm activation)
- All doors with hold opening devices (release in event of fire alarm activation)
- All fire shutters
- All systems shall automatically reset when the alarm is cleared

32.2.2 Wiring

Fire resistant cabling shall comply with BS 6387. All cables shall generally be concealed in ceiling voids, floor voids or perimeter boxing where possible.

Where cables are exposed on soffits or on fair-faced walls etc then these shall be concealed in painted steel conduit and be neatly coordinated with other services.

32.3 Standards

Fire alarm to BS 5839 - Part 1, category L2

Provide manual call points at all final exit doors and at stair landings on the upper floors.

The use of detectors on sounder/ beacon bases is preferred.

Provide signage to ISO 7010

Cabling shall be red FP200 type, concealed wherever possible or within galvanised steel conduit where exposed.

33 Assistance Call Systems

33.1 Scope

Design, supply, install, test, commission and set to work a new assistance call alarm system.

33.2 System Description

Assistance call alarms shall be provided in all accessible WCs c/w pull chords, reset buttons, local sounders and beacons, all linked back to a central remote monitoring panel (system status) located in the reception area.

The monitoring panel shall include a mute button to silence the audible alarm only, with full reset being required at the WC to cancel the visual alarm.

33.3 Standards & Approach

Building Regulations Part M.

All wiring shall be fully concealed in conduit.

34 Refuge Intercom

34.1 Scope

Design, supply, install, test, commission and set to work a new refuge intercom system.

34.2 System Description

New disabled refuge EVC systems shall be provided with communication points for the disabled refuges in the new staircase as indicated on the drawings.

The refuge intercom system shall allow 2-way communication between the refuge points on each stair landing and the main panel located in the main entrance.

The refuge panels shall be flush mounted, green finish with hands-free duplex communication.

The refuge call system shall be interfaced with the fire alarm system such that remote call stations only activate when the fire alarm system is active.

34.3 Standards & Approach

- Building Regulations Part B and Part M
- BS5839-9:2011
- BS 9999
- Fire-resistant cabling complying with BS 6387

35 Lift

35.1 Scope

Local modification and re-commissioning of existing passenger lift system.

35.2 System Description

The existing Orona passenger lift shall be retained and re-used.

The isolator providing power for the lift (currently within the existing electrical intake cupboard) will need to be relocated as part of the phase 1 works. The contractor shall make contact with Orona in order for them to recommission the lift following the relocation and reconnection of the power supply.

The existing CAT6 connection for the lift shall be replaced with new. The existing red-care telephone line shall be retained and re-connected.

A link to the new fire alarm system shall be provided for the lift, please refer to fire alarm section.

35.3 Standards & Approach

- European machine directive 2006/42/EC
- BS 6440:2011
- Building Regulations Part M

36 Lightning Protection

36.1 Scope

Design, supply, install, test, commission and set to work a new lightning protection system.

36.2 System Description

The building shall include a lightning protection system.

Tapes shall be PVC covered copper or aluminium tapes fixed with rigid mechanical fixings. Adhesive fixings are not permitted. Tapes shall preferably be aluminium to reduce risk of theft

New earth pits shall be provided as required with plastic bodies and lids, integrated with the hard landscape design.

Separation shall be provided to prevent corrosion between dissimilar metals.

The system shall be fully coordinated with the existing roof coverings and waterproofing details. No part of the lightning protection system shall reduce the integrity of the roof covering or water-proofing.

Bonds shall be provided to architectural metal work and rain-water pipes as required.

All visible tapes and bonds shall be agreed with the architect before installation.

Ensure that transient overvoltage surge suppression devices are provided for mains power, data, and telecom lines as appropriate to the required class of system as determined by the risk assessment

Ensure that surge suppression devices are provided in server rooms and any other vulnerable critical systems as determined by risk assessment

Ensure that surge suppression device alarms are linked to the BEMS where one is installed

Ensure the lightning protection systems are tamper proof with earth electrodes accessible for regular testing.

36.3 Standards & Approach

- BS EN 62305

END

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