Method Consulting

Intelligent engineering, sustainable buildings

Tavistock Guildhall

M&E Specification

Tavistock Town Council

October 2018

Document History

This document has been revised and issued as below:

Revision	Date	Description	Created by	Approved by
P1	12/10/18	Draft M&E Specification	TEK	NJS
P2	11/01/18	Draft Stage 4 Specification	TEK	NJS
T1	26/03/18	For Tender	TEK	NJS
T2	05/04/18	Comments from Architect	TEK	NJS
T3	25/04/19	Motorised Blinds Added	TEK	NJS

Contents

1 Introduction

This specification has been written to outline the proposed mechanical and electrical works at the Grade II* listed Tavistock Guildhall. It shall be read in conjunction with all relevant drawings and documents as listed in the Document Issue Register.

2 Engineering Services Scope of Works

2.1 Scope

The Contractor shall undertake all works associated with the strip out of the existing mechanical and electrical services and the provision of new 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:

- Detailed Design Drawings
- Mechanical & Electrical Services Specification
- Sample Sheet
- Distribution Board Schedules
- Instructions issued ratified during the course of the works
- Refer also to documents prepared by the Architect, Structural Engineer and Acoustic Consultant

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. All containment, supports and bracketry shall be included. Allow for attendances on all specialist contractors.

Note, ceiling and wall mounted services shall generally be concealed (chased) except for services:

- In service risers

<u>Statutory requirements</u>

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

Asbestos

The Contractor shall review all on-site Asbestos Management Plan and CDMC file prior to carrying out any works on site. Should the 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.

3 Contractor's Design Portions

3.1 Scope

The Contractor shall supply, install, test, commission and set to work complete installations for all systems outlined in this specification. Some elements of this specification shall be designed by the specialist contractor, these include:

- Boiler flues
- Controls
- Attenuator selections

- Smoke and fire dampers
- Small power for plant
- Data/telephone for plant
- Intruder alarm design
- Fire alarm design
- Services route details around steels and other obstacles etc
- Final wiring containment sizes
- Pipework expansion
- Earthing & bonding
- Weather proofing (by Main Contractor)
- Fire sealing (by Main Contractor)
- Courtroom & Magistrates room audio-visual systems
- Access Control Systems

The M&E sub-contractor shall note that the Method Consulting drawings of these are scheme intent only and the M&E sub-contractor shall be responsible for developing the design and completing the detailed design of these systems. Final responsibility for the complete detailed design rests with the M&E sub-contractor.

4 Provisional Sums

Provisional sums shall be used to cover items of work that do not have a defined scope. This includes:

- AV system for Courtroom: £10k+VAT
- AV system for Magistrates room: £10k+VAT
- BT Openreach modifications to incoming service: £5k+VAT

5 Contractor's Drawing Submittal and O&M Manuals

The M&E sub-contractor shall issue the following documents, for review, before installation works commence:

- Boiler flues installation drawings
- Controls technical submittal
- Ductwork fabrication drawings
- Attenuator selections

- Smoke and fire dampers layout drawing
- Small power for plant layout drawing
- Data/telephone for plant layout drawing
- Television and radio systems technical submittal
- Intruder alarm technical submittal
- CCTV technical submittal
- Fire alarm technical submittal
- Wiring containment sizes
- Pipework expansion technical submittal

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.

For the Operations & Maintenance Manuals the M&E sub-contractor shall produce a fully coordinated 'as built' drawing between the professions, (not as last instructed or construction issue drawings), but drawings that are checked and signed off as representing what has been installed. As-built drawings shall be presented in both DWG format and PDF format.

Other information required for the O&Ms includes:

1. Health and Safety Precautions
2. Description of Installation, date of completion etc
3. Description of Equipment (particular emphasis on what requires planned maintenance, so we can add it to our schedules)
4. Schedules of Equipment, Manufacturer details etc
5. Operating procedures
6. Routine Maintenance (Specific)
7. Copy 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 M&E sub-contractor shall also update M&E element of the Building Log in accordance with TM31.

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

6 Manufacturers and Products

Where “or equal and approved” has been written against manufacturers and products the M&E sub-contractor shall adhere to the requirements detailed in the Preliminaries prepared by the Main Contractor and the Client.

The M&E sub-contractor shall also note that all systems shall be true open protocol. Please be aware that the Client team shall not accept any system which does not comply with this statement. Any system which is found not to be true open protocol shall be stripped out and replaced with a system which is true open protocol, with the costs passed on to the M&E sub-contractor.

7 Maintenance

7.1 Scope

Itemised costs for the maintenance of M&E services shall be provided by the Contractor. The Contractor shall provide a 5-year maintenance plan.

8 Sustainability

8.1 Scope

The scheme shall not undergo any formal sustainability assessment (such as BREEAM).

9 Water & Energy Metering

Refer to scheme intent drawings for details of the principal meters.

Generally, sub metering shall be provided:

- In accordance with Building Regulations
- To reflect the separately tenanted spaces

Remote monitoring
No works proposed.

Building Energy Display Panel
No works proposed.

10 Building Regulations, Part L2A, EPCs

10.1 Scope

Building Regulations Part L
No works proposed – whilst Building Regulations Part L2B shall apply, there are exemptions noted in 3.6-3.13 apply regarding energy efficiency due to Listed Building Status. Therefore, given that it is proposed to replace the existing heating system with a new heating system, then any requirements shall be met.

EPC
No works proposed.

11 Commissioning & Client Training

Commissioning
Commissioning of all new and modified building services systems shall be undertaken in line with best practice in the industry and the current Building Regulations.

- BSRIA Application guide 2/89 - The Commissioning of Water Systems in Buildings
- CIBSE Commissioning Code Series A - Air Distribution Systems
- CIBSE Commissioning Code Series W - Water Distribution Systems
- CIBSE Commissioning Code Series C - Automatic Control Systems

Client training & seasonal commissioning
The Contractor shall:

- Demonstrate the completed and working system on the lead-up to handover
- Allow for 2No. return visits post-handover for further client training.

12 Power Failure Test & Spares

12.1 Scope

Simulated failure

Once the installation has been installed, set to work and is functioning under normal control the M&E sub-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 following spares shall be provided:

- None

13 Buried Services Survey and Services Diversions

13.1 Scope

As part of the CDM 2015 regulations it mandatory for a buried services survey to be conducted. The Contractor shall undertake this survey prior to undertaking any site works.

14 Project Phasing & Future Provision

14.1 Scope

The project shall be developed in a single phase with no requirement for future provision.

15 Below Ground Drainage

15.1 Scope

New below-ground drainage shall be required – this is specified by the Structural Engineer.

New rainwater drainage is required – this is specified by the Architect.

16 Above Ground Drainage

16.1 Standards

The whole installation shall comply with BS EN 12056 and Building Regulations Part H.

A heritage conservation qualified installer shall undertake all plumbing works.

External
New external above ground foul drainage shall be cast iron painted to Architect's specification (colour to match existing). Where pipework passes from internal to external, cast iron shall be used.

Internal
All internal pipework shall be uPVC with solvent welded joints and shall connect directly to below ground drainage sockets. Pipework shall be concealed in plumbing ducts or boxing.

Acoustic lining
Internal SVP02 shall be Wavin AS Acoustic rated pipework and acoustically clad.

Below ground drainage
New below-ground drainage connections are required for the new soil stacks – these are specified by the structural engineer.

Rainwater
All rainwater systems are specified by the Architect.

16.2 Scope

The existing internal above ground drainage services shall generally be stripped out in their entirety.

New above ground drainage shall be provided for all new sanitary appliances and condensate from plant (including boilers, as shown on the architect's drawings and shall connect into proposed drainage points.

Soil stacks shall be vented with automatic air admittance valves except for the head of drain vent which shall be vented to atmosphere above the roofline.

Air admittance valves (AAVs) shall be used to minimise the number of roof penetrations so that only the SVP at the head of the drain requires a roof penetration

Floor gulley
No works proposed – the boiler room shall be drained by making a new above ground drainage connection to the existing below ground drainage.

17 Water Services

17.1 Standards

Smart meter

A heritage conservation qualified installer shall undertake all plumbing works.

Building Regulations Part G.

A WRAS qualified installer will undertake all plumbing works. WRAS complaint equipment throughout.

The whole installation will comply with BS 8558, BS EN 806 and the Water Regulations of the water supply company.

External buried pipework
External buried pipework shall be barrier type blue MDPE.

Internal pipework

Except for exposed final connections pipework shall be copper to BS EN 1057. Generally, pipework shall be:

- Crimped within plant spaces
- Crimped within services voids
- Soldered where exposed
- Soldered where there is insufficient space for the crimping device
- Chrome where exposed for final connections on to appliances

Crimped copper pipework shall be Yorkshire Mapress with each joint marked with a cross when crimped and signed off by both the M&E site manager and main contractor site manager prior to closing-up.

All pipework will be concealed within voids or services risers except for final tails to appliances. All appliances will be fitted with isolation valves.

Sterilisation

All hot and cold water systems shall be chlorinated to BS 6700 and a certificate produced before handover.

Electric trace heating

Required on all external pipework runs.

Water softeners, scale inhibitors and water purification

Not required.

Metering

Required – refer to the Section 9 Water and Energy Monitoring

Water leak detection

All internal water meters shall have a pulsed output and shall be linked to the BMS for internal water leak detection purposes, including:

- High limit alarm
- Out of hours alarm
- Continuous low flow alarm

Automatic shutoff

No works proposed.

Water coolers and water boilers
No works proposed.

Insulation
All pipework shall be insulated and foil wrapped to BS 6422. All valves shall be insulated with valve mate fabric covers. All exposed pipework shall have Isogenopac cladding, with colour as specified by the Architect.

All pipework insulation shall have EMS certification e.g. ISO14001.

Thermostatic mixing valves
Grade 3 thermostatic mixing valves shall be installed on:

- All WHBs

TMVs shall not be installed on:

- Sinks

Flow restrictors
Flow restrictors shall be installed as follows:

- Showers: 12ltrs/min
- Wash hand basins: 5ltrs/min

Aerating taps
The Architect has confirmed that all taps shall be aerated.

Hose union taps
No works proposed.

17.2 Incoming Service

The building is currently served via 2No. metered South West Water (SWW) services:

- Service No.1 serves the North end of the building as well as the 2No. neighbouring cottages (and the museum too via a sub-meter) – it appears to have multiple entry points
- Service No.2 serves the South end of the building

Water service 2 shall be stripped out and replaced with new dia50mm MDPE between the existing SWW meters and the services entry points. Service 2 shall serve the whole of the building.

Water service 1 shall be retained, however, the incoming service into the guildhall shall be cut off and abandoned. Sub-meters should be added to the pipework serving the cottages, museum and outbuildings if possible.

Please note that the existing incoming services are reported to consist of lead pipework. The existing SWW meters shall be retained un-modified.

Photo 17.2.1: Location of South West Water water meter No.1 (under archway by the dog)

Photo 17.2.2: Location of South West Water water meter No.2 (by pavement across the carpark)

A sub-meter shall also be installed on Service No.1 so that the Town Council water usage can be separately recorded from the cottages.

Photo 17.2.3: Existing water stop-cock cupboard (to rear of WHS Orientation space)

Photo 17.2.4: Existing water service heading to the cottages

Fire hydrant
No works proposed – there is already an existing fire hydrant.

17.3 Scope

The existing hot and cold water services shall be stripped out in their entirety.

New services shall be provided throughout with all sanitary ware being mains fed – cold water storage shall not be provided since it has been confirmed by TTC that there are no reports of lack of water flow or water pressure.

Hot water local to plantroom
Hot water services shall be generated via an HWC with LTHW coil, 3kW electric immersion back-up and pumped hot water circulation loop, complete with central 5+2day timeclock control.

Hot water elsewhere
Hot water services shall be generated via local electric water heaters complete with central 5+2day timeclock control. This also includes the Welfare space.

Kitchenette
A ZIP hydroboil above sink water boiler shall be provided in the kitchenette.

18 Gas Services

18.1 Standards

Smart meter
A heritage conservation qualified installer shall undertake all plumbing works.

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

All above ground pipework shall be medium grade steel pipe to BS 1387 with screwed joints, painted yellow. Copper pipe is not considered to be suitably robust and shall not be used.

Below ground pipework shall be yellow HDPE with fusion welded joints.

The gas service shall be provided with an automatic fire solenoid shut-off valve. The fire valve shall be installed downstream of the meter manual emergency control valve inside the plantroom. The valve shall be hard wired and closure shall be by operation of a thermal link located above each burner, and push buttons located at the exit from the plantroom or a fire signal from the building fire alarm.

Gas works shall only be carried out by Gas Safe registered personnel.

Gas monitoring
No works proposed.

18.2 Incoming Service

There appears to be 2No. incoming gas services and 3No. meters. Service No.1 enters the building at the front where there is a U6 (approx. 65kW) gas meter (still live and in use) and serves the boiler contained within the lean-too outbuilding,

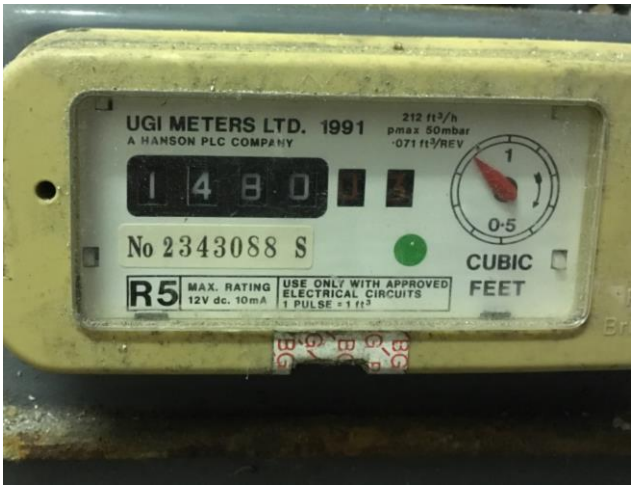

Photo 18.2.1: Existing U6 (~65kW) gas meter serving the boiler in the rear courtyard

Despite being live and still in use, this service shall be stripped out as it is too small to serve the entire building. The Contractor shall engage Wales & West Utilities and the Client in order to get this service stripped out and the meter removed.

The other service, which is a larger non-domestic service, enters the rear of the building into one of the original prison cells and serves 2No. meters, a U6 (approx. 65kW) and a U16 (approx. 165kW)

Photo 18.2.2: Existing gas meter(s) (U6 at H/L and U16 at L/L) located in one of the original cells

The Contractor shall engage Wales & West Utilities and the Client in order to get these meters stripped out and a new U25 metered (~250kW) service installed in a new location. Please note that initial enquiries with Wales & West Utilities confirm that there is sufficient spare capacity in the pipeline to deliver 250kW.

18.3 Scope

The existing gas services shall be stripped out in their entirety.

New gas services shall be installed to reflect the new arrangement.

Existing and retained serivce

There is some surface mounted pipework that runs through the rear courtyard towards the cottages. It appears that this is gas pipework and is fed from the neighbouring cottages. This pipework is capped off at high level within the proposed new tea-point located on the second floor. This service may still be live. As part of this contract the pipework shall be surveyed and identified with results reported back to the Client team and then isolated and removed including the length of surface mounted pipework in the rear courtyard wall.

Photo 18.3.1: Surface mounted pipework (possibly gas) leaving the Guildhall (on the left) and heading towards the cottages (on the right). The Contractor shall survey and identify what this pip is before isolating and removing.

19 Fire Suppression and Sprinklers

No works proposed.

20 Heating

20.1 Standards

The heating design shall comply with BS 8558, BS-EN-806 parts 1-5 and DS 439.

A heritage conservation qualified installer shall undertake all plumbing works.

The whole installation shall comply with BS 5440 and BS 6644 and BB 87 as appropriate.

Pipework shall be medium steel with screwed joints. Exposed pipework to radiators shall be painted – refer to the Architect's package for colour.

All pipework will be concealed within voids or services risers except for final tails to appliances. All appliances will be fitted with isolation valves.

The heating systems shall be pressurised LTHW operating at 70/50^{o}C for primaries.

Underfloor heating
No works proposed.

Radiator valves
All radiators shall include a thermostatic radiator valve (TRV) and lock shield valve (LSV).

Design temperatures
Please refer to the Selected Proposed Mechanical Services drawings for specific target design temperatures for each space – please note that the Exhibition Specialist has proposed that some spaces are un-heated.

Winter external design temperature:	-3°C
Seated occupied spaces:	21°C
Exhibition Spaces:	18°C
Selected corridors:	18°C

WCs:	18°C
Stores:	Unheated (frost protection in plantroom)
Victorian Cells:	Unheated (As requested by Client)

Pumps

All pumps shall be variable speed, inverter driven, selected from the Grundfos Magna 3 range.

Electric trace heating

Required on all external pipework runs.

Flushing loops

Required. 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.

Insulation

All pipework shall be insulated and foil wrapped to BS 6422. All valves shall be insulated with valve mate fabric covers. All exposed pipework shall have Isogenopac cladding, with colour as specified by the Architect – please note that there is quite a lot of exposed pipework.

All pipework insulation shall have EMS certification e.g. ISO14001.

20.2 Scope

The existing heating services shall generally be stripped out in their entirety (although services to ground floor and first floor Town Council spaces shall be retained as these were recently up-graded).

Photo 20.2.1: Existing boiler in lean-too boiler house (shall be stripped-out)

New services shall be provided throughout, with heat generated via central gas boiler plant via 2No. 110kW boilers and distributed via an LTHW radiator heating. All radiators shall include a thermostatic radiator valve (TRV) and lock shield valve (LSV).

Many of the new radiators shall adopt similar positions of the existing radiators.

Zoning

The heating system shall be zoned and sub-metered as follows:

- Town Council spaces
- Exhibition spaces
- Shared spaces

Overdoor air curtain

An LTHW overdoor air curtain shall be provided above the One Stop Shop entrance.

Radiant Panels

LTHW radiant panels shall be provided in the toilets by the Victorian cells complete with black bulb temperature sensor and a local thermostat linked to a two port motorised valve.

Electric panel heaters

Electric panel heaters, c/w 5+2day integral timeclock shall be provided for:

- Welfare
- School bag drop

21 Ventilation

21.1 Standards

A heritage conservation qualified installer shall undertake all plumbing works.

Building Regulations Part F. Building Regulations Part L.

All ductwork shall comply with DW144 c/w access panels, leakage tested and cleaned to TR19.

All ductwork shall be galvanised steel or similar approved.

Noise levels: NR30 < 30dB(A)

Average design pressure loss: <0.5Pa/m (normal operating conditions)

Turning vanes shall be installed on all bends including 45^{o} elbows

Motorised rooflights
WindowMaster spindle actuators shall be installed to the rooflights above stair 1 and stair 2. These shall be operated by local manual switches. Controller shall also be linked to rain/wind sensors which should automatically close windows in rain conditions.

Attenuators
Required on room side of central extract fans.

Crosstalk attenuators
No works proposed.

Grilles
Circular exhaust valve type vales throughout.

Louvres
Louvres will be selected from the Gilberts WH75 range. Colour to be confirmed by Architect.

Ductwork velocities
The ventilation systems shall operate at a maximum velocity of 2.5m/s.

Specific fan powers
Selected to comply with Building Regulations i.e. 0.5W/ltr/sec.

Marine quality
No works proposed.

Fans
All fans shall be ErP compliant, EC, variable speed, inverter driven.

Fire dampers & automatic smoke dampers
Automatic smoke dampers are required where ductwork passes through fire rated walls and floors where at least one side of the wall is within an escape corridor. Fire dampers are required where ductwork passes through fire rated walls and floors but neither side of the wall is within an escape corridor.

Flexible ductwork connections to grilles
Generally prohibited, however, flexible ductwork shall be limited to final 300mm connection on to grille.

21.2 Scope

The existing ventilation services shall generally be stripped out in their entirety.

The majority of spaces shall be naturally ventilated with openable windows.

The rooflights above stair 1 and stair 2 shall have motorised actuators installed and linked to local switch as well as rain sensor.

WC's
New ducted extract fans, linked to dedicated PIRs, shall be provided to new WC spaces.

22 Controls

22.1 Standards

Open protocol system.

Trend IQ4

22.2 Scope

The existing control systems shall be stripped out in their entirety.

A new Building & Energy Management System (BEMS) shall be provided. It shall comprise central controls with local set point adjustment and alarms including remote plant alarm and status monitoring functionality. 3No. principal zones (with separately programmable routines) shall be provided:

- Town Council
- Exhibition
- Shared

A data point shall be provided in the plantroom to allow the future installation of BEMS monitoring.

All energy and water meters shall be modbus type, with pulsed outputs, linked to the BEMS system for monitoring.

Control function	**Required?**
Central BEMS for heating and hot water services	Yes
Zonal heating control	Yes
Plant countdown run-on timers for each zone (3No.) Press once for one hour, twice for two hours etc.	Yes
Heating optimisation	Yes
Weather compensation	Yes
Frost protection	Yes
Night setback	Yes
Hot water priority	Yes

Control function	Required?
Hot water circulation	Yes
Electric immersion back-up	Yes
Anti-legionella purge	Yes
Gas solenoid shut-off	Yes
Gas sensing/ monitoring	No
Mech vent time clock to control MVHR units	n/a
Nat vent override & timeclock (high wind, rain, out of hours)	n/a
Fire alarm interlock (to boiler plant)	Yes
Fault alarm to main panel in plantroom	Yes
Data outlet	Yes
Link to internet	Yes
Water leak detection	Yes
Water sub-metering	Yes
Gas sub-metering	Yes
Heat sub-metering	Yes
Electricity sub-metering	Yes
Power outage auto restart	Yes

Table 22.2.1 Proposed control functionality

The BEMS shall perform the following functions:

- Provide optimised, weather compensated heating by enabling and disabling the gas boilers based on readings from master internal and external thermostats for each of the principal heating zones
- Provide temperature and time clock control of the heating (at least 6 different programmable temperature time profiles per day) for each of the principal heating zones
- Provide heating override facilities for each of the heating zones (override on and override off) via plant countdown run-on timers for each zone
- Provide time clock control of the secondary hot water circulation pumps
- Provide data connection links to the internet

- Provide enable and disable signals to the gas boilers (enable/disable the gas boilers and associated pumps)
- Provide cascade control of the gas boilers if/when they are enabled
- Provide automatic changeover of all twin head pumps
- Provide night setback and frost protection
- Provide a weekly run routine for the gas boilers and pumps (to ensure that they are occasionally enabled).
- Provide 2-stage frost protection at 5°C and 3°C
- Provide summer winter switch
- Provide all necessary safety interlock devices
- Provide interfaces to the various proprietary systems
- Provide holiday setting mode
- Provide heating failure indicator lamps
- Provide lamp test button

23 Low Voltage Distribution

23.1 Standards

A heritage conservation qualified installer shall undertake all electrical works.

Refer to Samples Sheet for details for socket outlet specification and styles. All switches and sockets shall be Part M compliant with visually distinguishable plates and outboard rockers. Generally grey sockets with white rockers on plastered surfaces. Galvanised steel with white faceplate on exposed stone walls.

The whole installation will comply with BS 7671: 2018 and the IEE 18th Edition and subsequent amendments.

Sub-mains cables will generally be LSF sheathed SWA cables run on cable trays.

Final distribution will generally use:

- Singles in galvanised steel conduit or trunking within plant spaces
- LSF T&E in galvanised steel conduit or trunking in all other spaces where exposed
- LSF T&E in basket and plastic conduit in all other spaces where concealed
- FP200 colour matched in all other spaces where exposed i.e. fixed to timber to serve lighting etc

All wiring ways will be concealed in voids or chased into walls. Surface mounted conduit or mini-trunking shall not be used.

Ensure separation between single phase circuits of separate phases and between single phase and 3-phase circuits.

All cables and containment will be concealed within the building fabric or voids. Surface mounted conduit or mini-trunking will not be used.

MEM white metal clad distribution boards, MCCB and MCBs

RCBO's
In order to reduce the risk of nuisance tripping from RCBO protection devices, a maximum of 16No. socket outlets shall be wired on any given circuit. RCBO protection shall be provided on all services other than lighting.

Photovoltaics
No works proposed.

Standby generator services
No works proposed.

23.2 Incoming Service

No works proposed. – we understand that the existing service was recently up-graded to an 80A 3-phase supply (55kVA), complete with new Western Power Distribution fuse head, meter and panel board.

23.3 Scope

The existing electricity services downstream of the existing panel board shall be stripped out in their entirety (although some services to ground floor and first floor Town Council spaces shall be retained as these were recently up-graded).

Photo 23.3.1: Recently up-graded panel board (shall be retained)

Split metered distribution boards shall be provided for all spaces.

Small power shall be distributed generally via flushed outlets.

Additional small power outlets shall be provided for miscellaneous equipment such as hand dryers. The requirements for these shall need to be developed.

Hand dryers

1No. Dyson Airblade V hand dryer shall be provided within each WC.

Photo 23.3.1: Dyson Air Blade V

Headset Charging

1No. outlet for the charging of informative headsets to be provided at the reception desk area.

Zoning

The electrical distribution system shall be zoned and sub-metered as follows:

- Town Council spaces
- Exhibition spaces
- Shared spaces

External services

IP65 MK Weather Seal socket outlets shall be provided within the external courtyards.

Electric chair charging points

1No. External electric chair charging point for wheelchairs / scooters shall be provided by the riverside entrance.

Motorised Blinds

Small power to operate the motorised blinds shall be provided to all windows in the Courtroom, to provide blackout conditions for the use of the projector.

AV Systems

The contractor shall provide the necessary power points and interfaces for the AV systems and these shall be agreed in advance with the AV specialist. For pricing purposes assume cabling and outlets for say 8 power points (twin switched socket outlets), as well as a hard-wired 2.5mm^2 LSZH single cabling between the main AV control point and each speaker point, the contractor shall agree the scope and location of these services with the AV specialist before installing and before the AV specialist's installation.

24 Lighting

24.1 Standards

A heritage conservation qualified installer shall undertake all electrical works.

The lighting installation shall comply with LG5, BS 5489-1:2003, BS 8300, A2:2008 Lighting of Roads and public amenity areas, Building Regulations Part M.

All luminaires shall be LED to 3000K.

LED light sources shall be used to provide general lighting throughout.

All luminaires shall be open protocol.

IP65 in wet areas

Luminaires shall achieve an efficiency of not less than 55 luminaire lumens/circuit Watt.

Luminaires shall have daylight dimming where shown on the drawings. Entire system shall be open protocol.

Emergency lighting

Emergency lighting shall be provided by means of converted self-contained versions of standard luminaires with NiCad batteries and control gear integral within the body of the luminaire. Test key switches shall be located on the lighting switch plate within the relevant space.

Illuminated emergency escape signs shall be provided in accordance with the escape strategy agreed with Building Control.

Emergency lighting shall comply with CIBSE lighting Guide LG12 and BS 5266-1:2016.

External lighting

External lighting shall have minimum lamp and gear efficacy of 80lm/W for colour rendering Ra ≤ 60 and 70lm/W for light sources Ra > 60

Design illuminance levels

Target daylight factor:	2%
Offices:	500lux at desk height
Building entrance:	20lux at floor level
Carpark:	20lux at floor level
WCs:	100lux to 150lux at floor level
Circulation spaces:	100lux to 150 lux at floor level
Plant rooms:	200 lux at floor level
Steps and ramps:	100lux at floor level
Wheel chair accessible walkways:	20lux at floor level
General external walkways:	5-10 lux

24.2 Scope

The existing lighting services shall be stripped out in their entirety (although some services to ground floor and first floor Town Council spaces shall be retained as these were recently up-graded).

All lighting shall be low energy, high quality LED. The installation shall be undertaken by NICEIC, IEE 18th Edition qualified personnel.

Lighting, including emergency lighting shall be provided in all spaces. All lighting shall be low energy, high quality LED. The plantroom and other functional areas shall consist of robust linear or bulkhead fittings with PIR control to suit the space. All lighting shall be switched locally via manual wall switches, manual wall switches with daylight dimming and some spaces having PIRs with daylight hold off.

Master Control Switch

A master control lighting switch shall be provided in the Gateway reception to turn on all the exhibition space lighting (to save a volunteer having to turn lighting on room by room at the start of the day).

Exhibition spaces

Refer to Exhibition Specialist's package for details.

AV Link
Lighting in the courtroom space and magistrates shall be linked to the AV control point.

External display lighting
External display lighting shall be provided to front entrance and illuminated signage to the rear gate leading to the pedestrian walkway. Building wash/spot lighting shall be provided at the front of the building as shown on drawings.

External lighting
Emergency bulkhead lighting shall be provided outside all external doors, switched via photocell and 5+2day timeclock.

5A lighting outlets
A 5A lighting circuit and outlets will be provided to the visitor information centre and shop for the display cabinets lighting.

Walkway and carpark lighting
No works proposed.

25 Telephone and Data Cabling

25.1 Standards

BT ducts and manholes

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

All cables and containment shall be concealed within risers and the building fabric (via new chasing) or voids. Surface mounted conduit or mini-trunking shall not be used, except for the plant spaces which shall use surface mounted galvanised steel conduit.

Network cabling
Network cabling shall be:

- It shall be Category 6a STP standard conforming to TIA/EIA 568B standards, with all terminations following the manufacturer installation guidelines

- No intermediate splices shall be used and the minimum and maximum bend ratios should be adhered to
- 300mm shall be provided as slack at each end of the cable run
- The length of any individual copper cable shall not exceed 90 metres between termination points
- All cables shall be terminated on appropriately labelled RJ-45 sockets;
- All data cables shall be low smoke and zero halogen type;
- Provide a 20-year manufacturer's warranty for the complete cabling system;
- Provide test results for the performance of 100% of the cables that have been installed. This testing is carried out by the cable installer; and
- All relevant documentation including network topology details, cabling test results, cabling test certificates, cabling warranty information, other network documentation shall be presented on handover

Fibre connections

Fibre connections shall be:

- It shall be conformant multi-mode OM3 1000BASE-SX fibre with 12 cores as a minimum, and shall provide a bandwidth of 2,000Mhz/km to allow future upgrades;
- It shall be installed with different routes back to the Server room to ensure that both cannot be severed at the same time
- The maximum length of the fibre shall be 300m, and this should be separately contained to avoid interference, with a bend radius controlled in line with the specification of the cable manufacturer
- Fibre warning labels shall be attached along the length of the cable
- Sufficient slack (3m+) shall be left at each end of the cable to facilitate re-termination or relocation;
- No intermediate splices shall be used in the cable runs
- Provide a 20 year manufacturer's warranty for the complete cabling system
- Provide test results for the performance of 100% of the cables that have been installed. This testing is carried out by the cable installer

Active equipment

Not required – this shall be provided and installed by the Client outside of this contract, however, the M&E sub-contractor shall arrange a co-ordination meeting of specialist services such as BMS, CCTV, Fire etc with the Client's IT specialist and active equipment provider. The Contractor shall liaise with the Client in order to decant the existing data cabinet, patch panels and active switches.

UPS services

Not required – this shall be provided by the Client outside of this contract.

Wi-Fi
The Contractor shall provide the data outlet, the Client shall free issue the WiFi terminal for the Contractor to install.

Data cabinets
Data cabinets shall be installed completed with patch panels and 6-gang power rails.

M&E plant
Additional data outlets shall be provided for miscellaneous equipment such as on-line networked access controlled doors, BMS, etc.

25.2 Incoming Service

We understand that the existing service was recently up-graded. However, it shall need to be relocated to reflect the new arrangement. It is the Contractor's responsibility shall liaise with BT Openreach and the Client in order to get the existing incoming service relocated.

25.3 Scope

The data services shall be relocated to reflect the new arrangement.

Fixed data points shall be distributed generally via flushed outlets. WiFi points shall be provided throughout.

Additional data outlets shall be provided for miscellaneous equipment such as shop tills.

Exhibition spaces
The data services for the exhibition spaces shall be provided.

Telephone links
The Client shall need to ensure that BT telephone connections shall be available for the following services:

- BMS
- Intruder alarm (BT RedCare)
- Fire alarm (BT RedCare)

AV Systems
The contractor shall provide the necessary data points and interfaces for the AV systems and these shall be agreed in advance with the AV specialist. For pricing purposes assume cabling and outlets for say 8 data points, as well as a hard-wired connection to the Wi-Fi system.

26 Television and Radio Services

No works proposed.

27 Public Address and Audio Visual

27.1 Standards

TBC

27.2 Scope

Courtroom & magistrates' room
The requirements for the new AV systems for the:

- Courtroom
- Magistrates room

Are subject to a provisional sum and the scope of works will be confirmed by the Client. An AV specialist such as APi communications (contact Matt Wyatt) shall design and install the system, with the contractor to provide the necessary interfaces for the system. The contractor shall agree with the specialist the power and data requirements for the system and provide these as part of their works.

Exhibition spaces
Refer to Exhibition Specialist's package for details.

28 Sound Amplification

28.1 Standards

Multiple loop system compliant with BS EN 60118-4 1998.

28.2 Scope

A hearing aid induction loop system shall be provided for the:

- Tourist Information reception
- Courtroom
- Magistrates room

Portable systems (purchased by the Client) shall be used elsewhere as and when required.

Exhibition spaces
Refer to Exhibition Specialist's package for details.

29 CCTV

29.1 Standards

IP, P.O.E, Cat 6a STP.

29.2 Scope

Exhibition spaces
Data outlets for the future installation of P.O.E cameras shall be provided for the future installation of a CCTV system.

General spaces
No works proposed.

30 Electronic Access Control

30.1 Standards

Access control shall be based on the Salto System, wireless convertible model, complete with RF antenna, and Gateway modules (with repeaters) throughout the building. This generally means:

- 3No. gateways per floor
- Up to 18No. nodes per floor

The contractor shall provide a system that provides coverage to all spaces within the building so that any door can communicate with the gateway node system (including the doors to the roof).

The contractor shall provide 1No. PC, 17No. flat screen colour monitor, keyboard and mouse which shall be supplied as part of this contract. The access control system shall include battery back-up to power the entire system in the event of mains power failure in full alarmed state for 24 hours.

Salto approved installer.

Single leaf doors shall be equipped with a battery operated, Salto Dead Lock (with latch provided by specialist iron monger rather than Salto – refer to Architect's package for iron monger details) with integral card reader. This lock is to provide the security to the door and so therefore does not require a maglock, they also do not require a push-to-exit or emergency break glass unit.

Double leaf and leaf and a half corridor and meeting room doors shall be accessed controlled with on-line (c/w data connection) magnetic locks on each leaf mounted at the top of each door on the secure side. The locks shall be powered by a local power supply unit connected to the mains supply. Each door shall be fitted with a data connection to monitor the status of the door (open or closed), a proximity card reader, a press to exit button and an emergency break glass unit which breaks the power to the magnetic lock and opens the door in an emergency.

30.2 Scope

Refer to the drawings for the locations of access controlled doors.

<u>Fobs</u>

50No. new staff fobs shall be provided within this contract.

Cards
No works proposed.

Main entrance doors
Main entrance doors shall be on-line (c/w data connection) and be fitted with a PIR detector on both the secure and non-secure side. A proximity card reader mounted on the building on the non-secure side of the outer door shall also be provided. Push-to-exit switches, emergency break glass units, which break the power to the magnetic lock and open the door in an emergency, and a key switch to allow manual adjustment of the door mode operation, shall also be provided on the secure side.

Riverside Entrance
Riverside entrance door shall be on-line (c/w data connection) and be fitted with a PIR detector on both the secure and non-secure side. A proximity card reader mounted on the wall on the non-secure side of the outer door shall also be provided. Push-to-exit switches, emergency break glass units, which break the power to the magnetic lock and open the door in an emergency, and a key switch to allow manual adjustment of the door mode operation, shall also be provided on the secure side. The door shall be motorised with a push to enter pad and remote release from the reception for the secure side and a push to exit or PIR on the non-secure side.

Audio visual intercoms with remote door release
Required as follows:

- Riverside Entrance to feed back to main reception
- Town council entrance to feed up to town council office FF
- G33 Access controlled Stair 2 to town council office SF

Motorised doors
Small power, data, access control and fire alarm links shall be provided for the motorised doors.

Carpark barriers
No works proposed.

Links to existing systems or other buildings
No works proposed.

Lift
Access control shall be provided on all lifts 1 & 3 to control movement of staff and visitors to/from each floor level.

31 Security Alarm & Detection

31.1 Standards

Intruder alarm to BS 4737 and ACPO guidelines. Grade 2 with Grade 4 Dual Path monitoring. Police response standard.

Secure-by-Design.

Honeywell Galaxy

Fully open protocol.

Central intruder alarm with magnetic contacts on all external doors and roof lights and dual technology (for sequential alarm configuration) PIR and microwave detectors to provide coverage to all internal spaces.

It shall include GSM digital communicators and be connected to a remote monitoring station. It shall also include battery backup for 24 hours.

31.2 Scope

The existing security alarm and detection systems shall be stripped out in their entirety.

A central intruder alarm system shall be installed and shall comprise of magnetic contacts on all external doors and dual technology (for sequential alarm description configuration) PIR and microwave detectors to provide coverage to all spaces with windows, doors and any other opening on the ground floor. The system shall be controlled by a central panel with integral keypad and LCD display for staff to set and unset the system.

Zoning
The intruder alarm system shall be zoned, with keypads provided, as follows:

- Town Council spaces (master keypad and slave keypads)
- Exhibition spaces (slave keypad)
- Shared spaces (slave keypad)

Wiring and cabling as recommended by specialist. All wiring shall be fully concealed and laid on cable trays or in conduit chased into walls.

Links to existing systems or other buildings
The intruder alarm shall not be linked to any other building other than a remote monitoring station.

32 Fire Alarm

32.1 Standards

Fire alarm to BS 5839

L3 category

Analogue addressable

Kentec panel, Apollo heads

Open protocol

Signage to ISO 7010

It shall include GSM digital communicators and connection facilities for BT Redcare and integral battery backup for 24hours.

Fire officer requirements

All cables and containment shall be concealed within the building fabric or voids. Surface mounted conduit or mini-trunking shall not be used.

32.2 Scope

The existing fire alarm and detection systems shall be stripped out in their entirety.

Photo 32.2.1: Existing fire alarm panel at high level (above doorway) shall be stripped out and removed

A new fire alarm system, with main panel located in reception, shall be provided. The system shall comprise detectors (smoke or heat, dependent on the use of the space), sounders, flashing beacons covering all principal rooms and red break glass units on escape routes and top of stairwells. Carbon monoxide detectors shall also be provided in spaces in gas boiler plantrooms.

<u>Doors with hold opening devices</u>
No works proposed.

<u>Fire alarm links</u>
Fire alarm links shall be provided for:

- Any roller shutter doors through fire rated walls (release in event of fire alarm activation)
- BMS (shut down boiler and ventilation plant)
- Gas solenoid valve (close in event of fire alarm activation)
- Door with door hold open devices

<u>Automatic opening vents</u>
No works proposed.

<u>Carbon monoxide detectors</u>

Carbon monoxide detectors shall also be provided in spaces in gas boiler plantrooms.

Links to existing systems or other buildings
The fire alarm shall not be linked to any other building other than a remote monitoring station.

33 Assistance Call Systems

33.1 Standards

Building Regulations Part M.

33.2 Scope

An assistance call system shall be provided for the accessible WCs. The system shall comprise an alarm unit with pull cord, reset button, internal reassurance light, external warning light and buzzer.

Repeater panel
A repeater panel shall be provided in reception.

34 Refuge Intercom

34.1 Standards

Building Regulation Part M

BS 5839

34.2 Scope

A refuge intercom shall be provided allowing 2-way communication between the refuge points and the main panel (which shall be located adjacent to the fire alarm panel).

The refuge intercom system shall include battery back-up to power the entire system in the event of mains power failure in its operational state for 24 hours.

All wiring shall be fire rated and fully concealed and chased into walls.

A link to the fire alarm shall be provided so that it is only operational during fire alarm testing/activation in order to avoid misuse.

35 Lift

35.1 Standards

Building Regulation Part M

Machine-room-less.

Lift 1 + 2: CIBES A5000 1100 x 1467mm Contact: Mark Spencer

Lift 3 Amalgamated Lifts - APL6

Lift 4: Moving step lift – Flexstep by Lift Up. UK Supplier: Platform Lift Co. Contact: Adam Boyne

35.2 Scope

A new internal machine-room-less passenger lift with automatic opening doors shall be provided. The lift shall include door openings and landing positions as reflected on the architect's plans. The lift capacity shall be confirmed by the Architect.

A new external machine-room-less passenger lift with automatic opening doors shall be provided. The lift shall include door openings and landing positions as reflected on the architect's plans. The lift capacity shall be confirmed by the Architect.

A new 2-in-1 step-lift shall be provided. Machine-room-less c/w battery back up. The lift shall include door openings and landing positions as reflected on the architect's plans.

<u>Access control</u>
Access control shall be provided to Lifts 1 & 3.

<u>Evacuation</u>

No works proposed. – evac chair proposed.

36 Lightning Protection

No works proposed.

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