BURO HAPPOLD

British Museum - Pizzeria Ventilation

MEP Specification Section B Project Specific Particular Requirements

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author	**Steven Cumming / Alan Hutchins**
date	**20/11/2020**
approved	**Phil Barnett**
signature	
date	**20/11/2020**

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B1 Part 1 Scope of MEP Services Installations

B1.1 Extent of Building Services Installations

A This specification section provides an introduction to the design of the Building Services for the British Museum Pizzeria and defines the operating parameters and the scope of works for the MEP sub contractor. The drawings, specifications and schedules indicate the full extent of the works and this section is primarily to assist the subcontractor in understanding the design concepts for each of the services. Refer also to the following documentation:

1 Main Contract Documents: Preliminaries/Project Information (British Museum)
2 Pre-Construction Health and Safety File
3 Section B Electrical Specification Section B Project Specific Particular Requirements
4 Section C (M&E) Materials and Workmanship – Mechanical Services
5 Section D Equipment Schedules (not required for Design & Build Tender)
6 Section E Standard Details (if not included in drawing package).

B Note that section C of this specification defines the plant and equipment materials, construction and workmanship. The specific performance and sizing details of plant and equipment is contained in Section D which comprises the equipment schedules for this particular project.

C The project includes the installation of a new dedicated kitchen ventilation system serving a 2no. stacked electric pizza ovens. The majority of the works are confined to the public restaurant located on the 1st floor on the South-West of the Bloomsbury site. The installation is broadly confined to a new ducted make-up and extract air systems, a new canopy arrangement, ceiling mounted supply and extract fans, power, controls and an air intake and exhaust outlet. The extract air shall be exhausted from the building via a vertically ducted flue mounted externally to the building.

D There will include a small degree of strip out works which are defined on the mechanical drawings. This will extend to a number of fouled ceiling tiles which are local to the existing extract canopy and will require replacement. The full extent of this shall be defined and agreed with the British Museum projects team. **There is no impact on the general reflected ceiling plan local to the new canopy, however allowance should be made to make a small adjustment to the ceiling grid position for the local extract grille should the site situation not accurately reflect the record drawing.**

E The Mechanical Services comprise the following:

1 Ventilation and Exhaust air
2 Thermal Insulation
3 Noise and Vibration control
4 Automatic Controls including MCCP
5 Mechanical services field wiring
6 Testing and Commissioning of the Mechanical Services.

F Where equipment models and services network distribution, duties or dimensions are quoted in the MEP documentation they are representative only of a quality standard or as a need to assist with architectural space planning. It is the Contractor's responsibility to define by calculation and planning all equipment selections, service network distribution, access and maintenance requirements and operating efficiencies.

G The Electrical Services comprise the following:

1 Power Installation
2 Fire alarm system modification works
3 Mechanical system control panel and field wiring
4 Testing and Commissioning of the Electrical Services

H The following abbreviations are used in this specification and drawings:

1 CIBSE: Chartered Institution of Building Services Engineers
2 SLL: Society of Light and Lighting
3 IET: Institution of Engineering and Technology
4 ECA: Electrical Contractors Association
5 BMS: Building Management System
6 TSSO: Twin Switched Socket Outlets
7 SSO: Single Switched Socket Outlets
8 A.C.: Alternating Current
9 LV: Low Voltage: Voltage
a A.C: ≥ 50V and ≤ 1000V or 600V between conductors and earth
b D.C: 1500V between conductors or 900V between conductors and Earth
c D.C. <120V ripple-free
10 XLPE: Crosslinked Polyethylene
11 LSF: Low Smoke and Fume
12 MCC – Motor Control Centre
13 SWA: Steel Wire Armoured

B1.1.2 CONTRACTOR SUBMITTALS

A Refer to Main Contract Document which details the extent of design services to be provided.

B There are other elements of contractor design embedded within section C of the specification where specialist design is required by the installing contractor. If required this will be stated in the relevant parts of section C.

C Provide drawings, calculations and submittals in accordance with the requirements indicated in Section C of this specification, particular requirements:

1 Supports & fixings
2 Anchor loads
3 Supporting beams

D Refer to section A of specification regarding requirements for:

1 Design of systems
2 Submittals:
a Drawings for approval
b Samples for approval
c Calculations for approval
d Regulatory approvals.

B1.2 Definitions Used in the Specification

A Within this Section B document references are made to "contractors" as set out below:

1 Main Contractor (or management contractor), employed by the client and contracts out packages or trades to sub-contractors
2 Building Services Contractor; a sub-contractor employed by the Main Contractor to carry out the work described by this specification. This is a generic term and includes the Mechanical and Electrical Services sub-contractors whether part of the same company or separate companies
3 Mechanical Services Contractor; a sub-contractor employed by the Main Contractor to carry out the mechanical services installations
4 Electrical Services Contractor: a sub-contractor employed by the Main Contractor to carry out the electrical services installations
5 Specialist Contractors; normally employed by the Main Contractor or Building Services Contractor and often supplying a design function with warranty.

B2 Mechanical Services Design Parameters

B2.1 Project Specific System Operating Conditions – Mechanical Services

A The following clauses provide a brief summary of the design operating parameters of the mechanical, electrical and plumbing installations. Select plant and equipment that is compatible with these operating conditions. Refer also to the schedules of equipment section D which provide more detailed information on the plant performance.

B Ductwork Standards of Construction Max. velocities:

1	Low pressure systems	10 m/s max
2	Medium pressure	20 m/s max
3	High pressure	40 m/s max

C Ventilation Standards:

a Specific Fan Power comply with:
- Building Regulations
- Non-Domestic Building Services Compliance Guide as indicated below.

Type of Distribution	Specific Fan Power (SFP) W/l/s	
	New Buildings	Existing Buildings
Central, mech vent with heating & cooling	1.6	2.2
All other mech vent systems	1.1	1.6
Zonal supply – remote fan - (ceiling void or roof mounted units)	1.1	1.4
Zonal extract – remote fan	0.5	0.5
Zonal supply and extract vents - ceiling/roof void serving single area zone with heat recovery	1.9	1.9
Local supply and extract vents- window/wall/roof units serving single area with heat recovery	1.6	1.6
Local supply and extract vents - window/wall/roof units serving single area	0.3	0.4
Other local ventilation supply or extract units	0.5	0.5
Fan assisted VAV unit	1.1	1.1
Fan coil unit	0.5	0.5
Kitchen extract fan – remote- with grease filter	1.0	1.0
Increases to SFP for additional system components		
Additional return filter for heat recovery	+0.1	+0.1
HEPA filter	+1.0	+1.0
Heat Recovery Thermal Wheel	+0.3	+0.3
Heat Recovery Other Systems	+0.3	+0.3
Humidifier/dehumidifier	+0.1	+0.1

b Air Filtration standards:
- ISO 16890-1 “air filters for general ventilation”

c Maximum Design Duct Air Velocities.

Design Background Noise Criterion NR Levels	**Main Risers/Distribution m/s**	**Branch Ducts m/s**	**Branches to terminal units m/s**
40 (low velocity systems)	7.5	4.5	2.5
35	6	4	2.2
30	5	3.5	2.0

B2.2 External Design Conditions Mechanical Services

A Location and topography:

1 Longitude: 51°'N
2 Latitude: 0.12ºW
3 Altitude: 8m above sea level

B External temperatures: For the design of all building thermal loads and selections of room located cooling plant the following external conditions will apply which represents a condition which causes the largest conductive heat transfer into (summer) or out of (winter) the building.

1 Winter: -3°C db 100% RH
2 Summer (sensible heat design): N/A

C Noise Levels: External noise levels will comply with the following:

1 At site Boundary: Ambient level as existing

B2.3 Internal Design Parameters Mechanical Services

A The internal design parameters are indicated on the following schedule for the pizzeria.

Table 1 Internal Design Parameters Mechanical Services

	Location	Occupancy	Winter Temps		Winter RH		Summer Temps		Summer RH		Air Change Rates		Min Fresh Air	Pressurisation	Air Conditioned	Back-ground Noise Level	Lighting Cooling Load	Internal Equipment Cooling Loads
Description		No. or pers/m^2	°C	Range °C	%RH	Range %	°C	Range °C	%RH	Range %	Supply AC/hr	Extract AC/hr	l/s per person	Pa	Yes/No	NR / dB(A)	W/m^2	W/m^2
Kitchen/Dining	1st Floor	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A		-ve	No	40 / 45	N/A	N/A

B3 Electrical Services Design Parameters

B3.1 Project Specific System Operating Conditions Electrical

A The following clauses provide a brief summary of the design operating parameters for the electrical installations. Select plant and equipment that is compatible with these operating conditions.

1 LV network: 400V/50Hz
2 LV network: 200V/50Hz

B3.2 Electrical Services Systems Design Criteria

A Electrical cabling and LV systems: Select cables according to the following schedule and refer also to the specification section C and cable schedules for specific details.

1 Final LV circuits:
   a Single core cabling: 6491B LSF
   b Twin & Earth cable: 6242B LSZH (cable for domestic wiring).
   c Multi-core armoured cable XLPE/SWA/LSF
   d FP200/MICC
2 Earth cabling:
   a 6491B Single Core LSF cable.

B Fixed Equipment: Provide for following and as indicated on the drawings:

1 Switched fused connection units
2 Start/stop station
3 MCCP
4 Local isolators:
   a As indicated.

C Mechanical Services Equipment: Provide power to fixed items and mechanical services equipment with local isolation and final connections.

D Fire Alarm:

1 System Type: Analogue Addressable
2 Standard: BS5839.
3 Fire alarm cabling:
   a FP200 Gold cabling
   b FP Plus 'Enhanced' cabling

A Containment: Provide as follows for the following distribution networks:

1 LV power/controls: Cable tray/basket/conduit/clipped direct
2 Fire Alarm Cable tray/Basket/clipped direct

B4 Heating Services

A Heating of the make-up air supply shall be provided from an electric heater battery located within the supply air handling unit. The heater battery shall be sized to deliver air at 14°C during the heating season.

B5 Air Conditioning Systems

B5.1 HVAC System Descriptions

B5.1.1 Restaurant

A The fresh air intake shall be drawn from the ground level through a **new weatherproof duct mounted louvre/ grille and directed ducted into the building. This air shall be transported via a ducting system indicated on the drawings and brought into the Pizzeria restaurant ceiling void via** motorised fire damper arrangement. This ducted air shall then be supplied direct onto the supply spigots of the new capturejet type canopy (TYP KH2).

B The extract air shall be ducted from the new canopy and exhausted to atmosphere via a jet type flue hood at the existing roof plant level, a minimum 1m above the existing parapet. The extract ductwork shall be fire rated in line with section U80 within Section C of this specification.

C The supply and extract fans shall be interlocked. The intake air motorised fire damper shall also open when the system is activated, and close when the system is turned off. It shall contain a fusible link rated at 1 hour equivalent.

D The exhaust air shall pass from one fire compartment to another, and therefore shall be fire rated to the same rating as the barrier.

E There is no requirement for odour control on the exhaust air system.

F The new canopy shall be constructed to the requirements set out for KH2 canopies in Section C of this specification. The canopy shall contain the following features

G A new riser access door arrangement shall be agreed with the British Museum project team. This new access door shall however be installed with airtight seals so as to ensure air is drawn in to the building cavity from the new dedicated transfer grille directly above.

H The contractor is to procure the motor control panel (MCP) from the British Museum's approved/appointed panel supplier. The supplier is ICW Powermode Limited who can be contacted at:

30 Old Broad Street,

London,

EC2N 1HT

Contact: Sam Smith, Executive Director

Telephone: 020 7531 1111

I The contractor is to utilise the existing Schneider distribution board, which currently supplies the two pizza ovens, to provide power to the new MCP.

J The existing supplies to the pizza ovens are to remain in place/service, the supplies being removed from the distribution board and terminated within the MCP. Connections from the Schneider DB being routed to the MCP accordingly, as shown on the schematic diagram of the MCP.

K The contractor is to install the remote stop/start unit adjacent to the existing pizza isolators, this unit will also contain a visual indication that power is available to the ovens.

L The contractor is to supply and install local isolation to the plant as shown on the sketches, comprising double-pole isolators for single-phase equipment and triple-pole isolators as required.

M The contractor is to engage the British Museum's fire alarm specialist (Honeywell), to provide and I/O connection point adjacent to the MCP, supplied from the existing loop, a copy of the fire alarm drawing is provided within this documentation.

N Duct mounted differential pressure switches are to be installed to provide indication of flow status for both supply and extract fans.

O The duct mounted thermostat will be set to provide heating when the intake air falls below 10°C.

P In the event of activation of the Museum's fire alarm, all functions of the panel will be automatically isolated.

Q The MCP interlocks prevent the oven supplies from being energised unless the fire and air-flow criteria are met.

R Remote equipment such as heater battery, extract and supply fans and motorised damper are to be supplied through the use of multicore SWA cables.

S The electrical contractor is to liaise with the mechanical contractor to agree the operational parameters required for the differential pressure switches.

T **The contractor shall not suspend any heavy materials direct to the clay pot structure making up the floor slab above. This includes any fan, heater battery, filter section, attenuators or kitchen canopies, electrical panels. The aforementioned items shall be indirectly supported from the concrete slab potions using a system of anchored steel supports suitable to carry the plant loads.**

B6 Automatic Controls

B6.1 BMS General Automatic controls

A Employ the British Museum's approved panel/switchboard to manufacture a control panel to the requirements of the schematic panel drawing(s) provided with this specification.

B This section B sets out the specific requirements and control routines for the particular plant and equipment incorporated into the project.

C Refer to section C, Y41 which identifies the following requirements that are common to all projects:

1 Controls hardware
2 Installation
3 Commissioning
4 Training
5 Operating and maintenance manuals
6 Attendances after commissioning
7 Control in a fire situation:
  a Automatic shutdown
8 Monitor and provide indication when:
  a systems are out of control ranges
  b there are operational fault conditions.
9 Monitor and provide interfaces with specialist systems such as:
  a Fire alarm systems plant shut down alarms

D Provide maintenance of the complete installation for one year after handover. Include in the tender for maintenance to include:

1 Replacement of all defective equipment during the maintenance period

B6.2 BMS Network Configuration

A Provide Motor Control Panels (MCPs) to provide power and control to all mechanical equipment within the listed below.

1 Pizzeria

B Co-ordinate the supply of the controls provisions with the suppliers/ manufacturers of the following systems:

1 Kitchen Extract Fan
2 Air Handling Units
3 Integrated Kitchen Canopy Fan
4 Motorized Dampers

C The remaining items of mechanical plant are to be controlled via input / output signals from dedicated MCCP. The contractor is to provide any necessary sub network communication interfaces to field devices from the above control panel.

D Locate items of control equipment such that access for adjustment and maintenance purposes is not impeded. Where items of control equipment are mounted in accessible positions within occupied areas provide the control with facilities to prevent unauthorised adjustment.

B6.3 Room Sensors/Controllers

A This section describes the project specific requirements for temperature, humidity, fan coil and VAV controllers for this specific project.

B Provide temperature sensors and differential pressure switches and locate to suit the conditions being controlled according to the design intent. All wall mounted sensors and controllers to be suitable for installation on British Standard conduit boxes.

1 Kitchen ventilation controller:
   a Controllers to have the following project specific features:
      - Wall mounted: Surface type MCCP

B6.4 Time Scheduling and Event Profiles

A Manual operation through the use of local controls adjacent to the pizza ovens.

B6.5 Plant Monitoring and Alarm Reporting

A Provide for the following alarm priorities (for every alarm generated) and determine the actions required in discussion with building user. The following list may be used as a default.

1 **(maintenance flag)**: No effect on system performance in the short term so items should be attended to during routine maintenance procedures brought forward if necessary. Actions required:
   a Visual Alarm generated at MCCP
2 Status: Provide actual status (on/off and trip/fault) indication. This means generating an alarm if any plant that should be operational is not running.
3 All Air Handling Plant:
   a Filter Blocked alarm – level 3

B6.6 Energy Monitoring– Metering

A There is no energy monitoring associated with this plant replacement project.

B6.7 Project Specific Description of Control systems

B6.7.1 Air Handling Unit – Kitchen Supply with Separate Extract

A These AHUs deliver constant volume air to the kitchen or kitchen canopy

B Startup: AHUs will operate under manual control from the kitchen user.

C Supply/Extract fans:

1 Interlock the supply fan with the extract fans
2 For AHU operation under fire circumstances see section “Control in a fire”
3 Filter condition indication lamp:
   a Clean
   b Dirty
4 IP rating: 54

B6.7.2 Control in a Fire Situation

A On fire alarm initiation, signals shall be relayed to the MCPs via interface units provided by the fire alarm sub-contractor. The fire alarm sub-contractor will provide adequate tails on the interface unit adjacent to the MCPs to enable the interface wiring to be terminated within the MCP

1 Automatic response on fire evacuation signal: All mechanical plant to be shut down.
2 Fire Dampers: Not monitored

B7 LV Distribution

B7.1 LV Plant, Load Centres, and Distribution

B7.2 Mechanical Supplies

A The British Museum's approved switchgear/specialist contractor will provide a new mechanical services control panel, the electrical contractor is to install power and control wiring and distribution from the panel. Electrical contractor to provide supplies into the panels from the adjacent Schneider distribution board. MCP and mechanical services distribution as shown on the MCCP schematic diagram.

B Liaise with the mechanical services designer with regard for load, protection and termination details.

C Mechanical sub-contractor to provide the correct equipment load details to ensure that the cabling is of the correct size.

D Cable & Containment types: electrical contractor to supply and install MCP panel outgoing cables to suit the protection provided within the control panel and the particular equipment served. Cable types and containment to be:

1 XLPE/SWA/LSF, installed on perforated steel cable tray
2 LSF singles in conduit / metal trunking
3 LSOH XLPE insulated multicore LV cables (including isolators)
4 Include for making final connections

E Isolators and Switch Fuses: Provide all switch fuses from a single manufacturer and rated to suit their application:

1 Plantroom use: Rated to suit equipment:
   a Internal use: Recessed type complete with low level cable outlet
   b External isolators: IP65 rated
   c Type of Wiring
   d Small power sub circuit cabling: LSF singles, with cables protected by conduit/metal trunking as described.
2 Mechanical services:
3 XLPE/SWA/LSF, installed on perforated steel cable tray
4 LSF singles in conduit / metal trunking.

B7.3 Small Power Distribution

A Provide the small power installation to include:

1 Supplies to fixed items of equipment
2 Supplies to mechanical services throughout the project domain
3 Conduit and trunking
4 Wiring
5 Supports,
6 All accessories
7 Final connection to equipment.

B Provide switched fused connection units, double pole switches, local isolators for supply to fixed and equipment as indicated on the room data sheet schedule and generally to such items as:

1 Ventilation hood lighting

C Provide power to fixed items and mechanical services equipment with local isolation and final connections as follows:

Item	Provided By	Fixed By	Electrical Connections By	Final Connection
Extract fan	ESC	ESC	ESC	3I
Supply fan	ESC	ESC	ESC	1T
Heater battery	ESC	ESC	ESC	3I
Motorised damper	ESC	ESC	ESC	1T
Fire alarm I/O interface	ESC	ESC	ESC	n/a
Differential pressure switches	ESC	ESC	ESC	n/a
MCCP	ESC/BM specialist contractor	ESC	ESC	Built in isolator
Remote stop/start	ESC/BM specialist contractor	ESC	ESC	n/a

Where the abbreviations have the following meaning:

1 ESC: Electrical Services Contractor
2 FCU: Switched Fuse Connection Unit – back entry to equipment
3 3I: TPN isolator with flexible conduit connection
4 1T: DP isolator with flexible conduit connection

D Provide Final circuiting as follows:

1 Comply with relevant sections of BS7671
2 Where practical route the electrical distribution:
   a Concealed In ceiling voids
   b Concealed In floor voids
   c Routed along corridors
   d Dropping down within partition walls.
3 Supplies to equipment panels and isolators feeding fixed equipment:
   a Run in multi-core cables
   b Fed from MCCB/ MCB depending on rating of the equipment.
4 Connections to socket outlets and fuse connection units:
   a Single core LSF cables
   b enclosed in conduit.

E System Cabling: Small power installation to be carried out in LSF insulated cables enclosed in conduits/steel trunking within ceiling voids with separate CPC's. Drops to accessories to be by concealed conduits.

F Fixed items of equipment: Served by radial circuits, terminating in switched or un-switched fused connection units or switched isolators as listed below:

1 BS7671 regulation 607-02-06 shall be applied e.g. all socket outlets to have high integrity earth terminals.
2 Provide all accessories switch plates with a label indicating full circuit reference that the accessory is connected to. Label style

a Black on white
b Permanently fixed (6mm font).

B7.4 Containment Systems

A Secondary containment: To be designed, supplied and installed by the electrical contractor.

B Containment will generally comprise cable trays, cable baskets and trunking. The containment system should allow for rewiring with draw wires provided back to accessible locations.

C The horizontal routes will generally follow the main corridor runs and circulation spaces where possible. Install this containment in ceiling voids. Provide easy access for maintenance.

B8 Earthing and Bonding System

B8.1 General Description of System

A Provide an earthing and bonding system to protect the building.

B The provision shall include the earthing and bonding of all metalwork associated with the electrical installations including:

1 All metal cable sheaths
2 Cable armouring
3 Metal conduit
4 Trunking and similar equipment
5 Earth terminals of the apparatus.

C All metalwork which may provide a path to earth, such as components of hot and cold water systems, heating systems, metallic waste pipes, stainless steel units etc., that are within 2m of any switch, switched socket or other electrical outlet are to be bonded to the electrical earthing system and to the incoming water services in accordance with the current edition of the IEE Regulations.

D Design Parameters:

1 BS EN62305 - Code of practice for protection of structures against lightning
2 BS 6701 - Code of practice for installation of apparatus intended for connection to certain telecommunication systems
3 BS 7375 - Code of practice for distribution of electricity on construction and building sites
4 BS 7430 - Code of practice for earthing
5 BS 7671 - Requirements for electrical installations. IET Wiring Regulations. Seventeenth edition Electricity Supply Regulations
6 Local Electricity Supply Authority Requirements.

E Provide:

1 Equipotential bonds: To all major metal work structures and metal systems
2 Trunking conduit, ducting, pipe work etc. shall be bonded across joints to ensure the complete installation is bonded as a continuous circuit. All earth conductors shall be labelled to show the area they serve
3 Cable armour will be used for earth return paths supplemented where necessary by a separate copper conductor

B9 Lightning Protection System

B9.1 General Description of System

A Provide connections to new roof plant and equipment, flues, etc. from the existing lightning protection system.

B The system shall consist of:

1 Roof tapes
2 All associated fixtures and fittings.

C Air Termination Network:

1 For all areas of flat or pitched roof the specialist contractor shall bond through the roof finish, to a surface fixed lightning protection roof air termination network.
2 Conductors for the air termination network:
   a 25 x 3mm bare aluminium to BS2897
   b 25 x 3mm bare copper to BS1432
   c Run parallel with the building edges.
3 All new metallic projections on or above the roof surface, including flues, ducts, vent pipes, aerials, railings, metallic guttering and metallic roofing must be bonded to the air termination network. Connections must be of the same integrity as that used throughout the system

D For installation, testing and commissioning requirements refer to section C of this specification.

B10 Standards

B10.1 Standards General

A The Building Services installations for this project shall be carried out in accordance with the following Codes of Practice, guides and standards:

1 Life Safety Standards
2 Building Regulations
3 Mechanical services standards
4 Electrical Services standards
5 Plumbing and Drainage standards
6 Project Specific standards.

B10.2 Life Safety Standards

A The following documents relate to Life Safety but the list is not exhaustive and other British standards will apply. When dated the version indicated applies and when not dated use the latest edition including amendments:

1 BS 9999: Code of Practice for fire safety in the design, management and use of buildings
2 BS 476 (All Parts) Fire tests on building materials and structures
3 BS 5266-1 Emergency Lighting Code of Practice Part 1
4 BS 5266-7 (BS EN 1838) Lighting applications - Emergency Lighting
5 BS 5306 Fire Extinguishing installations and equipment on premises:
   a Part 0: Guide for the selection of installed systems
   b Part1: Hose Reels and Foam Inlets
   c Part2: Specification for Sprinkler Systems
   d Part3: COP for inspection and maintenance of portable fire extinguishers
   e Part 4: Specification for carbon dioxide systems
   f Part 5: Halon Systems
   g Part 6: Foam Systems
   h Part 8: Selection and installation of portable fire extinguishers.
6 BS 5655-6 Lifts and service lifts part 6 COP for the selection and installation of new lifts
7 BS 5839-1 Fire Detection and Alarm Systems for Buildings. COP for design, installation, commissioning and maintenance of systems in non-domestic premises.
8 BS 5839-9 Fire Detection and Alarm Systems for Buildings:
   a Part 1: COP for design, installation, commissioning and maintenance
   b Part 3: Specification for Automatic release mechanisms for certain fire protection equipment
   c Part 9: COP for the design, installation, commissioning and maintenance of emergency voice communication systems.
9 BS 7036 (All Parts) COP for safety at powered doors for pedestrian use
10 BS 7273 – 4 COP for the operation of fire protection measures – Part 4: Actuation of release mechanisms for doors
11 BS 7346-3 Components for smoke and heat control systems:
   a Part 3: Specification for smoke curtains
   b Part4: Functional recommendations and calculation methods for smoke and heat exhaust ventilation systems
   c Part 6: Specifications for cable systems
   d Part 7: COP on functional recommendations and calculation methods for smoke and heat control systems for covered car parks.
12 BS 7671 Requirements for Electrical Installations – IET wiring (17th Edition) Regulations
13 BS 8300 Design of Buildings and their approaches to meet the needs of disabled people
14 BS 9251 Sprinkler systems for residential and domestic occupancies –COP

15 BS 9990 COP for non-automatic fire –fighting systems in buildings
16 BS 54-7 Fire Detection and Alarm systems
   a Part 7: Smoke Detectors
   b Part 11: manual call points.
17 BS EN 81 Safety rules for construction and installation of lifts
18 BS EN 115 Safety Rules for the construction and installation of escalators and passenger conveyors
19 BS EN 378 Refrigerating Systems and heat pumps – Safety and environmental requirements
20 BS EN 671 Fixed Fire Fighting Systems – Hose Systems
21 BS EN 12101 Smoke and Heat control systems
22 BS EN 12416-2 Fixed Firefighting systems – Powder systems Part 2: Design, installation and maintenance
23 BS EN 12845 Fixed firefighting systems- Automatic sprinkler systems – Design Installation and maintenance
24 BS EN ISO 14122-4 Safety of machinery – permanent means of access to machinery – Part 4: Fixed ladders
25 BR 186 (BRE) Design Principles for Smoke ventilation in enclosed shopping centres
26 BR 368 (BRE) Design Methodologies for smoke and heat exhaust ventilation.

B10.3 Building Regulations

A Comply with the following Building Regulations: Approved Documents:

1 Structure
2 Fire Safety Vol 1 Dwelling Houses
3 Vol2 Buildings other than Dwellings
4 Site preparation and resistance to contaminations and moisture
5 Toxic Substances
6 Resistance to the passage of sound
7 Ventilation
8 Hygiene
9 Protection from falling, collision and impact
10 1A/1B, 2A,2B: Conservation of Fuel and Power
11 Access to and use of buildings
12 Electrical safety dwellings.

B Comply with the following where appropriate:

1 Local Authority Regulations
2 Environment Agency Regulations and Codes of Practice
3 Health and Safety Executive: Guides and Codes of Practice

B10.4 Mechanical Services Standards

A Comply with Guidance notes, Technical memorandum and standards provided by the following Institutions:

1 CIBSE Chartered Institution of Building Services Engineers (UK)
2 BS British Standards and Codes of Practice
3 BESA Building Engineering Services Association.
   a DW 172 Design for Kitchen Ventilation System

B10.5 Electrical Services Standards

A Comply with the following British Standards where applicable:

1 BS 9999 Code of Practice for fire safety in the design, management and use of buildings
2 BS 5266-1 Emergency Lighting Code of Practice Part 1

3	BS 5266-7	(BS EN 1838) Lighting applications - Emergency Lighting
4	BS 5839-9	Fire Detection and Alarm Systems for Buildings COP for the design, installation, commissioning and maintenance of emergency voice communication systems
5	BS 5839-1	Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises
6	BS 7671	Requirements for Electrical Installations – IET wiring Regulations 17th Edition
7	BS EN1838	Emergency lighting
8	BS EN 62305-1	Protection against Lighting. General Principles
9	BS EN 62305-2	Protection against Lighting. Risk Management
10	BS EN 62035-3	Protection against Lighting. Physical damage to structures and life hazard
11	BS EN 62035-4	Protection against Lighting. Electrical and electronic systems within buildings
12	BS 7430	COP for protective earthing of electrical installation
13	BS EN 81	Lifts and Service Lifts
14	BS EN 60439-1	Specification for Low Voltage Switchgear and Control gear Assemblies.

B Comply with the following Guidance notes and technical memoranda:

1	CIBSE	Guides to Current Practice and Technical Memoranda
2	CIBSE	Code for Interior Lighting
3	CIBSE	Code for Exterior Lighting
4	SLL	Code for Lighting
5	SLL	Lighting Handbook
6	SLL	Lighting Guides
7	ECA	Electrical Contractors Association.

B10.6 Project Specific Standards

A In addition to the above, the following standards may be applicable. Variations brought about due to these will be incorporated in discussion with the Client, for both mechanical and electrical services:

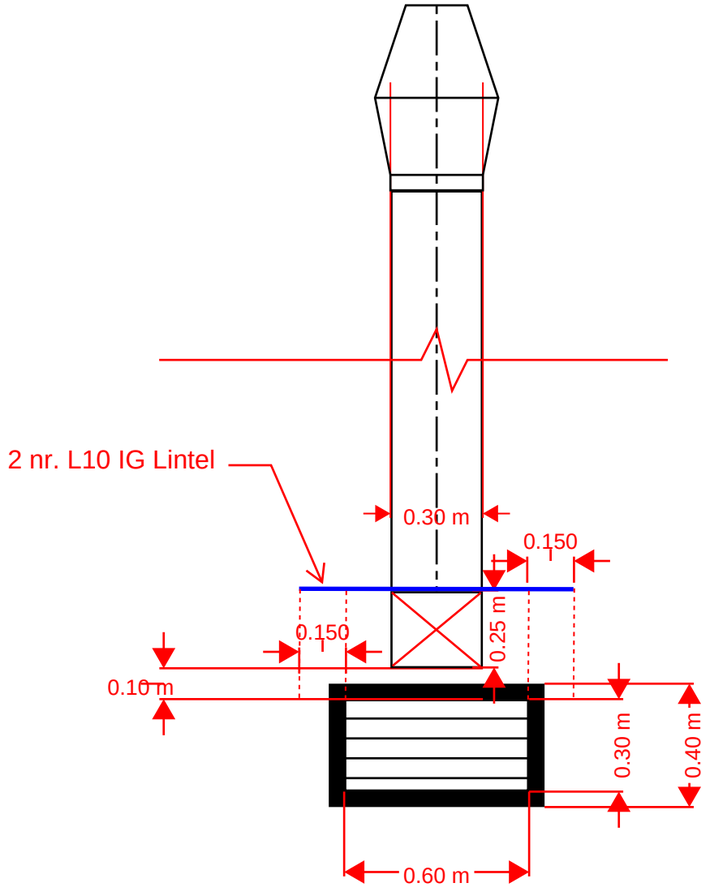
1 Financier
2 Insurance Companies
3 Local Authorities
4 Local Utility Suppliers Regulations.

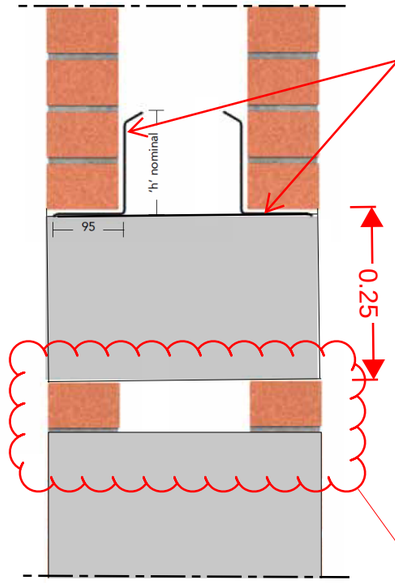
B11 Civil/Structural Engineering Works

B11.1 General Requirement

A The contractor is to confirm the wall build-up to the structural engineer upon making the new building openings.

B Refer to the sketched details enclosed on the next page.





2 nr. SS L10 IG Stainless Steel Lintel - h'=60mm L=0.9m

Masonry should not overhang any flange by more than 30mm.

The contractor shall verify the existing lintels and existing restraint ties to ensure adequate structural support and lateral stability of the brickwork

Material:
Stainless steel grade 304 2B to BS EN 10088-Part 2 Astm 240 (European Grade 1.4307)

Installation:
Lintels to have a minimum end bearing of 150mm on each side of the opening bedded on mortar. Level the lintel along its length and across its width. Raise the inner and outer leaves of masonry simultaneously. Lintels may be propped to facilitate speed of construction.

DAMP PROOFING
Provide a damp proof course over all lintels.

When the underside of a lintel is exposed, its appearance can be enhanced by the addition of lintel soffit cladding.

Product Reference:
IG: SCW

Installation:
Attach the built in plastic clip end to the front outer flange of the lintel. The length of the Lintel soffit should be the same as the opening, not the length of the lintel.

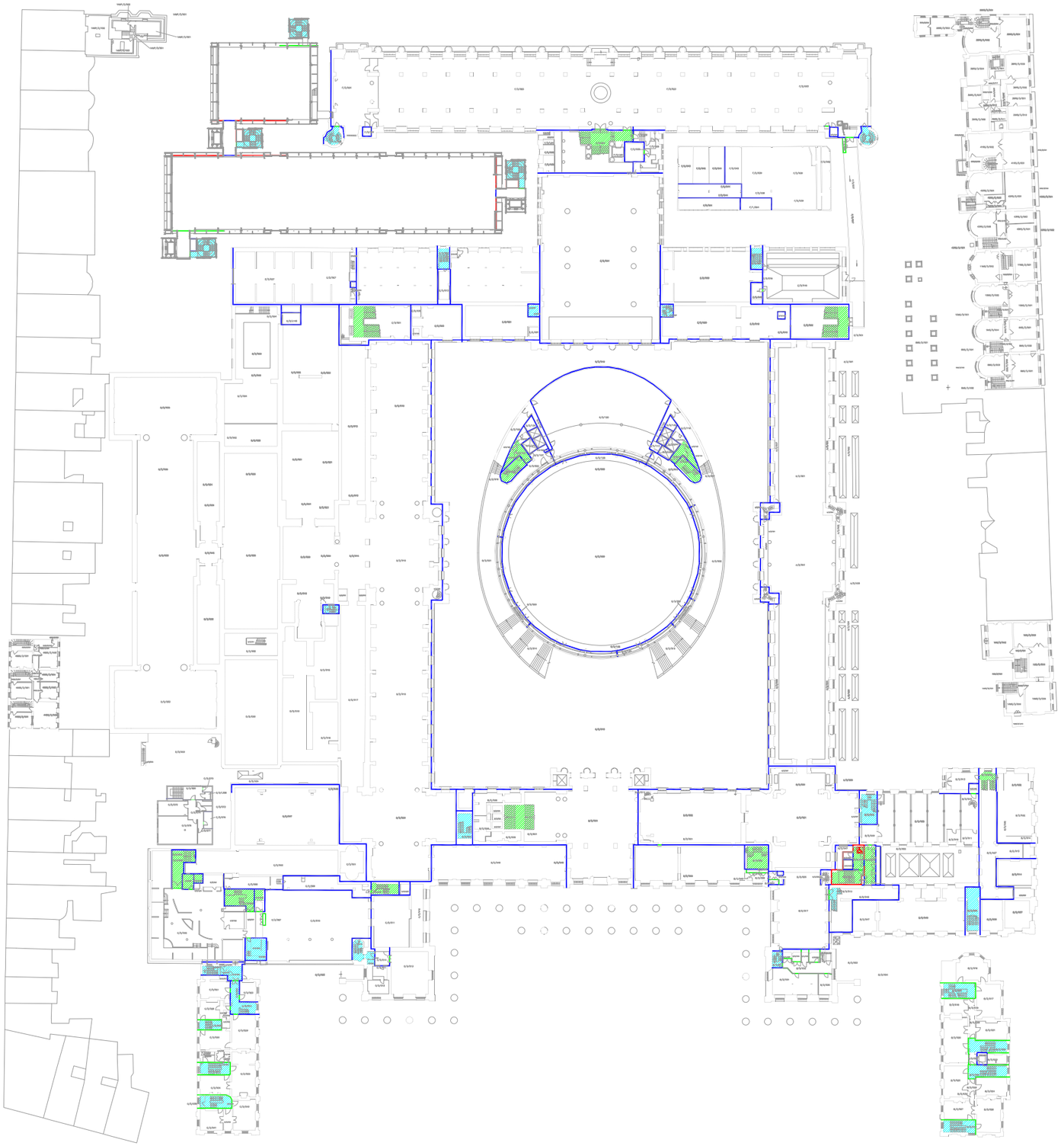
Before starting the work, contractor to carry out a survey on the wall build up and submit a method statement. Structural Engineer to confirm the selected lintel.

BUROHAPPOLD ENGINEERING	JOB TITLE:	BRITISH MUSEUM	JOB NUMBER:	040792	DATE: 20/11/20
	SKETCH TITLE:	LINTEL TO NEW PENETRATION ON EXISTING MASONRY WALL	SKETCH NUMBER:	SK(S) SHEET 1 OF 1	INITIALS: SC

B12 Record Fire and Life Safety Information

A Record Fire & Life Safety Strategy Drawing

B Record Fire Detection Layout



Level 03

Key:

- 4 Hour Sector Boundary
- 2 Hour Fire Rated Construction
- 1 Hour Fire Rated Construction
- 30 Minutes Fire Rated Construction
- Protected Lobby or Route
- Protected Staff Staircase
- Disabled Refuge

Fire Consultant:

Fire Engineering & Fire Risk Management Consultants

Legion House, Lower Road, Kenley, Surrey, CR8 5NH
Tel.: +44 20 86688663 Fax: +44 20 8668 8583
Email: fire@lwf.co.uk web: www.lwf.co.uk

Project:
British Museum

Subject:
Fire Strategy

Rev:	
A	Issue for comment
B	Amendments and updates

Drawn: MM	Chkd: KT	Appd: GDN
Date: Feb' 2015	Scale: NTS	
File Ref: 14075-FS-BM-08 - F	Rev: B	

British Museum - Fire Strategy

BEACON PANEL CCT C PSU
C8/187 - OUTER MODULE
C8/186 - INPUT MODULE (FAULT)
LOCATED IN TOP OF LIFT SHAFT

BEAM DETECTORS
C5/185
C5/186
C5/187

TRANSMITTER
TX-R5 XXXX

BOOSTER

TRANSMITTER
TX-R6 1160

BOOSTER

BEAM DETECTOR - HARTWELL
C6/151 (FIRE)
C6/152 (FAULT)
MODULES LOCATED IN RISER
SEE LEVEL 5 DRAWING

Note:

All critical dimensions should be checked on site before the commencement of any design or construction work. Any discrepancies found on this drawing should be reported immediately to the author. Do not scale from the printed drawing for design or construction purposes.

NOTE: SURVEYED AND UPDATED BY SURVEY INTERNATIONAL IN 1992; DIGITISED FROM ORIGINAL 1:100 SCALE FILM DRAWINGS PRODUCED IN 1975.

LEGEND

- M — BREAK GLASS CALL POINT
- DD — SMOKE DETECTOR
- DD — SMOKE DETECTOR WITH ISOLATION BASE
- HD — HEAT DETECTOR
- IM — INPUT MODULE
- OM — OUTPUT MODULE
- BD — OPTICAL BEAM DETECTOR TRANSMITTER
- BR — OPTICAL BEAM DETECTOR RECEIVER
- BM — OPTICAL BEAM DETECTOR MIRROR
- SD — SMOKE DAMPER
- DH — DOOR HOLD/ OPEN CLOSER UNIT
- IM — LINE ISOLATION MODULE
- FS — FIRE SHUTTER
- XENON BEACON
- PSU — POWER SUPPLY UNIT
- JB — JUNCTION BOX

26/06/2019 Rev C, ADDED GALLERY CAFE AND HARTWELL STAIR DEVICES
01/08/2018 Rev B
ADDED WEST RESIDENCE FIRE ALARM SYSTEM

The British Museum
Great Russell Street London WC1B 3DG www.thebritishmuseum.ac.uk

client

project
LIFE SAFETY DRAWINGS

drawing title
FIRE DETECTION
LEVEL 3 - SECTOR C

date	scale	dwn
MAY 2016	1:100@A0	BM

drawing number	rev
LS-A-300003	C

Steven Cumming / Alan Hutchins
Buro Happold Limited
Camden Mill
Lower Bristol Road
Bath
BA2 3DQ
UK

T: +44 (0)1225 320 600
F: +44 (0)870 787 4148
Email: steven.cumming@burohappold.com