ELECTRICAL SERVICES SPECIFICATION

Heaton Hall Country House – Prestwich

Manchester City Council

Document No. 24/100/ES/01/C

May 2024

DOCUMENT CONTROL SHEET

Prepared & Edited By: 	Ged Mitchell Building Services Engineer For and on behalf of ECS Consultants Ltd	
Approved By: 	Stephen Levell CEng MCIBSE Building Services Engineer Managing Director - ECS Consultants Ltd For and on behalf of ECS Consultants Ltd	
Date of Issue: 29th May 2024	File Name: Electrical Services Specification Document Ref: 24/0100/ES/01/C	Version: Rev C Status: Rev C

This report/specification and information or advice which it contains, is provided by ECS Consultants Limited solely for internal use and reliance by its client in performance of ECS Consultant Limited duties and liabilities under its contract with the Client. The advice, opinions, or recommendations within this report/specification should be read and relied upon only in the context of the report/specification as a whole. All advice and opinions in this report/specification are based upon the information made available to ECS Consultants Limited at the date of this report/specification and on current UK and European Standards, Codes, technology, and construction practices as at the date of this report/specification. Following final delivery of this report/specification to the Client, ECS Consultants Limited will have no further obligations or duty to advise the Client on any matters, including development affecting the information or advice provided in this report/specification unless otherwise detailed in the ECS Consultants Limited Fee Proposal. This report/specification has been prepared by ECS Consultants Limited in their professional capacity as Consulting Engineers. The contents of the report/specification do not, in any way, purport to include any manner of legal advice or opinion. This report/specification is prepared in accordance with the terms and conditions of ECS Consultants Limited contract with the Client. Regard should be had to those terms and conditions when considering and/or placing any reliance on this report/specification. Should the Client wish to release this report/specification in paper or PDF format to a Third Party for that party's reliance, ECS Consultants Limited may, at its discretion, agreed to such release provided that:

a) ECS Consultants Limited written agreement is obtained prior to such release, and
b) By release of the report/specification/specification to the Third Party, that Third Party does not acquire any rights, contractual or otherwise, whatsoever against ECS Consultants Limited, and ECS Consultants Limited accordingly assume no duties, liabilities, or obligations to that Third Party, and
c) ECS Consultants Limited accepts no responsibility for any loss or damage incurred by the Client for any other conflict of ECS Consultants Limited interests arising out the Client's release of this report/specification/specification to the Third Party.

GENERAL ELECTRICAL SPECIFICATION

GENERAL

The Contractor shall note that this document does not include the ECS Consultants General Electrical Services Specification.

This document is available for inspection at the offices of ECS Consultants Ltd or can be e-mailed upon request in PDF format.

The Contractor shall note that any claims resulting from not examining this document at tender stage shall not be entertained.

PARTICULAR ELECTRICAL SPECIFICATION

GENERAL

The following particular specification relates to the protection of artwork and artefacts, building, civil, and all preparatory works to enable the electrical re-wiring, associated fire safety, security, and emergency systems to be undertaken at Heaton Hall, Heaton Park, Prestwich, Manchester, Greater Manchester, M25 9WL.

The works shall comprise of both building, civil, protection and electrical improvements works to:

(i) Main Hall Building (Grade 1 Listed Building)

In addition, and as part of the above works, various building works shall be undertaken to protect the existing building artwork and artefacts during the works. The complete contract includes the following works:

(i) Electrical Rewire of the Main Building
(ii) Building adaptations to allow the above works to be completed

The Principal Contractor shall note no claims shall be entertained for loss of potential earnings due to any sections of the Tender Summary being omitted from the Contract.

The Principal Contractor shall include to liaise with the Contract Administrator to ensure that the installation is harmonised with the existing building construction.

The Principal Contractor shall include to liaise with his electrical sub-contractor to effect fully co-ordinated systems.

The Principal Contractor and his subcontractors shall include to cross reference this specification with the appropriate drawings. In all situations, any discrepancies shall be resolved by the Principal Contractor, including within the tender, the worst-case scenario.

The particular electrical specification shall comprise of the following sections:

1. GENERAL NOTES
2. CONTRACT ADMINISTRATION
3. SCOPE OF WORKS
4. CONTAINMENT WIRING SUPPLIES AND METHODS OF INSTALLATION
5. INCOMING TELECOMMUNICATIONS
6. INCOMING ELECTRICAL SERVICE & LOCAL PRIVATE TRANSFOMERS
7. MAIN SWITCHGEAR AND SUB-DISTRIBUTION
8. SUB DISTRIBUTION SYSTEM
9. SURGE SUPPRESSION
10. ARC FAULT DETECTION DEVICES (AFDD)
11. GENERAL LIGHTING INSTALLATION AND CONTROLS
12. EMERGENCY LIGHTING INSTALLATION
13. EXTERNAL LIGHTING
14. SMALL POWER INSTALLATION
15. HEATING PLANT CONTROL WIRING
16. WET AREA VENTILATION SYSTEMS
17. ORANGERY BLOCK - NEW KITCHEN SUPPLIES

18. FIRE ALARM INSTALLATION
19. INTRUDER ALARM SYSTEM
20. TELECOMS AND DATA INFRASTRUCTURE INSTALLATION
21. EXISTING ACCESS CONTROL SYSTEM
22. CCTV SYSTEM
23. PLANT CONTROLS
24. TELEPHONY INSTALLATION
25. EARTHING AND BONDING
26. LABELS AND CIRCUIT CHARTS
27. TESTING, COMMISSIONING AS FITTED DRAWINGS AND MAINTENANCE MANUALS
28. BUILDER'S WORK
29. CIVIL WORKS
30. SEALING OF WIRING SYSTEM PENETRATIONS
31. SYSTEM DEMONSTRATION
32. PHASE RE-BALANCING
33. PREPARATORY WORKS
34. CLEANING REQUIREMENTS UPON COMPLETION OF WORKS
35. REMOVAL OF EXISTING INSTALLATIONS
36. TEMPORARY SUPPLIES AND LIGHTING
37. PROPOSED PHASING NARRATIVE OF THE WORKS
38. SERVICING WORKS DURING DEFECT LIABILITY PERIOD
39. PC SUMS

1. GENERAL NOTES

The complete electrical works, as detailed in this Specification or shown on the associated electrical drawing, shall be carried out to the satisfaction and in accordance with the rules, regulations and requirements of the supply authority, the fire officer concerned (if applicable), the appropriate British Standard Code of Practice and the recommendations laid down in the current edition of the Regulations for the Electrical Equipment of Buildings issued by the Institution of Engineering & Technology. The works shall pass the survey of their respective inspectors. The final test and inspections for completion of the certificates as required by the IET Regulations shall be witnessed by the contract administrator. The principal contractor shall service all notices for testing, pay all fees in connection therewith and any additional charge for re-testing. Compliance with these requirements must be to the entire satisfaction of the contract administrator.

The Tenderer will be deemed to have visited the site and be fully aware of all conditions relevant to the installations. Any ambiguity on the drawings or specification must be clarified during the period of tendering. Arrangements to visit the site or clear any ambiguity may be made with the contract administrator.

Additional claims will not be entertained after receipt of the tenders due to lack of knowledge on the part of the Tenderer.

This section of the Specification shall be read in conjunction with the preliminary clauses, tender drawings, General Specification for Electrical Engineering Services and Conditions of Contract. In the event of any discrepancy between the General Specification and the Particular Specification and tender drawings, the Particular Specification and tender drawings shall be followed. However, any ambiguity should be checked with ECS prior to any works being undertaken.

The installation shall comply with all relevant statutory instruments, standards, and regulations **current at the date of tender** and in particular with the following:

1.1 Statutory Requirements

(i) The Health and Safety at Work Act
(ii) The Management of Health and Safety at Work Regulations
(iii) The Workplace (Health, Safety and Welfare) Regulations
(iv) The Construction (Health, Safety and Welfare) Regulations
(v) The Construction (Design and Management) Regulations
(vi) The Building Regulations
(vii) The Electricity at Work Regulations
(viii) The Electricity Safety, Quality and Continuity Regulations
(ix) Control of Substances Hazardous to Health
(x) RIDDOR - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations

1.2 British and European Standards and Guidance Notes

(i) LOLER Approved Code of Practice and Guidance
(ii) CIBSE Guides
(iii) BS 7671 Requirements for Electrical Installations. The IET Wiring Regulations and associated guidance notes
(iv) BS EN 60038 CENELEC standard voltages
(v) BS 5839 Fire Detection and Fire Alarm Systems for Buildings
(vi) BS 5266 Emergency Lighting

Where Provisional Sums are included; details must be resolved early by application for details to the contract administrator, to avoid delay or disruption to the job programme. Such sums will or will not be expended at the discretion of the contract administrator.

The Principal Contractor shall note that a full asbestos survey has been undertaken and a report has been produced. Prior to the routing of any cabling and containment systems, the Principal Contractor shall include to be familiar with the locations of asbestos containing materials and utilise a strategy of accordance.

The Principal Contractor shall note that other minor quantities of asbestos shall remain in place. The Principal Contractor shall conduct toolbox talks to all operatives and have a copy of the asbestos survey report on site so a strategy of avoidance can be employed.

Site Visit

Tenderers are strongly recommended to visit the site during the tender period to assess the practical difficulties of the project and to include for same within their offer, as no variation of costs will be considered on the plea of insufficient information during the tender period.

Site visits should be made by prior arrangement with **Mr. Tony Jones Team Leader Engineering Group, Capital Programmes, Corporate Core Directorate, Manchester City Council Mobile: 0798 531 3674 or Mr Gerard Mitchell ECS Consultatnts on Mobile 07740 100726**

The postal address of the site is Heaton Hall Heaton Park Manchester M25 2SW.

General Building History and Construction

Heaton Hall Country House was until recently used as a museum and art gallery. The hall is a mid-eighteenth-century building, remodelled in 1772-89 by James Wyatt for Sir Thomas Egerton, enlarged with a new orangery building added circa 1823 by Lewis Wyatt.

The building consists of sandstone ashlar with dressings of Coade stone, hipped slate roofs. Long range on east-west axis, composed of a central block linked by colonnaded wings to octagonal pavilions (kitchen to west, library to east), and with 1823 additions to the north side of wings and pavilions, and orangery continued at east end. Palladian style one and two storeys with entrance front to north and principal facade to south, both symmetrical.

The south facade, entirely by James Wyatt, is composed of a 2-storey 5-bay centre with a prominent 3-window bow, flanked by single-storey 7-bay wings with tall colonnades mounted on steps and linked to slightly higher octagonal single-storey pavilions.

The centre block has steps up to the bow flanked by a lion and lioness of cast lead on stone pedestals; giant Ionic semi-columns to the bow and pilasters to the outer bays, a guilloche string-course, plain frieze, cornice and blocking course; its bow has 12- and 9-pane sashed windows, Coade stone panels between floors depicting classical rustic scenes, and a shallow domed lead roof; and each outer bay has a large Venetian window in a blank arch at ground floor, and a 9-pane sash above.

The colonnades have fluted friezes enriched with antique ox-skulls (bucrania), and very tall 15-pane windows (those of the left wing now boarded). The pavilions each have pilasters and a frieze like the colonnades, a cornice and high parapet, a large Venetian window in the centre and swaged panels over the windows in the canted side bays.

The north front of the main block, 2:3:2 bays, with pedimented centre breaking forwards, 1st-floor sill-band, moulded cornice and blocking course, has a tetra style portico mounted on steps, tall 12-pane sashed windows at ground floor, horizontal panels above these, and 9-pane sashed windows at 1st floor; and attached at each side of this are the 1823 additions to the rear of the wings, 2 lower storeys and 7 bays each, with pilasters and sashed windows (differing slightly), and massive clustered chimney stacks.

The former orangery to the east, facing south, is a long symmetrical single-storey range, 3:3:5:3:3 bays, with projected polygonal centre, the ends colonnaded and the rest pilastered with a full-height window in each bay, a moulded cornice and blocking course carried round the whole, and now with a flat roof replacing the original glazed central dome and pitched roofs.

Interior Aspects

Fine original features including entrance hall, staircase hall with imperial staircase and colonnaded landing, saloon, dining room, billiard room, music room, library, and at 1st floor the Cupola Room which has very rare survival of complete Etruscan style decoration.

East wing and kitchen are currently derelict, and restoration suspended at time of survey, containing some original features, e.g., servants' stairs, fielded panel cupboards in former house-keeper's room, and 2 large segmental-arched fireplaces in opposed walls of kitchen.

GENERAL BUILDING CONSTRUCTION OF EACH FLOOR AND ASSOCAITED WINGS

The main building consists of three floors, basement, ground and first floor covering three different types of areas of the building namely the west wing, east wings and central block with a single storey extension called the Orangery The type of construction of these areas are as follows.

Basement Area

The building comprises a part basement area which includes a central corridor with a brick vaulted ceiling and chambers either side to access the suspended timber ground floor. In this area the walls are of brick construction with exposed brickwork throughout.

Ground Floor Area

The ground floor comprises of a mixture of solid flagstone floors and suspended timber floors. The various rooms have been finished to a range of standards.

The majority of rooms have deep skirting boards, plaster dado and picture rails and deep ornate cornice details. It is noted that one wing of Heaton Park Hall has suffered extensive fire damage (West Wing) with exposed brickwork and exposed timber joists.

The former Bakery building is attached to the fire damaged west wing and has similar internal areas which are exposed brickwork and exposed timber joists.

The ceilings in all areas are of lath and plaster construction. One wing (East Wing) of the ground floor is known as the orangery. This wing is of single-storey construction with a flat roof. All services within this area are exposed with cables clipped direct.

First Floor Area

The first floor generally comprises of two wings. The first wing is of ornate decoration with deep skirting boards, plastered dado and picture rails and ornate cornice. This replicates the ground floor main areas.

The second wing is a space that will have been originally given over to children and staff. This space has a much lower floor-to-ceiling height with limited decoration, comprising only of shallow cornices. The ceiling in all areas is of lath and plaster construction.

The first floor is generally of chamber construction, except the main stair core which is of wrought iron construction with a flag finished floor. The chamber construction comprises of floorboards which are pinned together using timber dowels with timber joists below and then cross batons beneath the timber ceiling lath and plaster.

Roof

The roof is of traditional slate tile pitch construction comprising of pearling’s supported by masonry, with roof spas fixed directly to the pearling’s to form the apex roof construction.

Initial examination has revealed that the roof void does not benefit from extensive thermal insulation and was found to be in an untidy state of repair. This space, however, will prove beneficial for the routing of electrical services to supply the first-floor area

1.3 Asbestos

The Principal Contractor shall note that the original country housebuilding has asbestos materials in various areas. These are detailed in the Asbestos Register.

These materials have been identified within an intrusive survey and include asbestos insulation to existing pipework in various areas.

A copy of a number of recent and historic the Asbestos report is contained, forming part of the main project contract documents.

The Asbestos Survey Specialist shall be commissioned and appointed by Manchester City Council.

The Principal Contractor shall support MCC who will arrange and commission a new refurbishment Asbestos Survey as part of the works and appoint an Asbestos Specialist contractor who has experience of working within a Grade 1 Listed building, principal contractor shall include to liaise with an asbestos contractor

The Asbestos Removal Contractor shall be appointed by Manchester City Council.

The Principal Contractor shall include to make all allowances within the contract programme for the removal of asbestos. No claims shall be entertained to additional temporary plant hire costs in relation to asbestos works.

The Principal Contractor shall obtain a copy of the Asbestos Register from the Contract Administrator and include to review prior to the submitting of the tender.

The Principal Contractor shall advise the Contract Administrator of any asbestos associated works that need to be carried out ahead of their removal/installation works.

If, during the project works, any suspect materials are discovered in the existing building, all work within the area shall be suspended and the contract administrator will be informed.

The Electrical Contractor

The Electrical Contractor shall be on the NICEIC Approved Contractor Scheme, operated by the NICEIC under licence from Electrical Safety First and/or be ECA registered Members, whose benchmark for competence is the Electrotechnical Assessment Scheme published by the Institution of Engineering and Technology (IET). In addition, they must be members of the Joint Industry Board (JIB) and be to the approval of the Contract Administrator.

The above requirements may also include Sub-Contractors who work under the Joint Negotiating Committee for Local Authority Services (Building and Civil Engineers) and/or the National Joint Council for Local Authority Services (Manual Works) and/or the Joint Negotiating Committee for Local Authority Services (Engineering Craftsmen) and/or the standing conference for mechanical sub-contractors.

The Electrical Contractor must liaise closely with the Principal Contactor and his other Sub-Contractor' to ensure, the design criteria outline on the tender drawings and this specification are complied with.

The Electrical Contractor will be required to carry out the complete electrical building services Installation in accordance with the general technical specification and the relevant performance specification and the associated drawings.

The Electrical Contractor shall retain on site, during all working hours, a competent foreman who shall be his fully accredited representative with authority to accept and carry out formed and authorised instructions.

The whole of the works shall be carried out in a workmanlike manner to the satisfaction of the contract administrator. All materials are to be adequately protected and stored. All cabins required for this purpose and welfare facilities for the Contractor's operatives shall be provided by the Principal Contractor.

No variations or additions to the contract are to be undertaken without the prior approval of ECS Consultants.

The tenderer shall note that the premises are to be left in a clean and tidy manner at the cessation of work on each and every working day.

The Main Building Contractor will be designated Principal Contractor selected to execute the work will be required to carry out the complete electrical building services installation in accordance with the general technical specification and the relevant specification and the associated drawings.

2. CONTRACT ADMINISTRATION

The following section shall be read in conjunction with the employers' requirements, all other contract documents, and the general conditions of contract.

2.1 General

Under the project and contract, the Main Building Contractor shall be appointed as the Principal Contractor. The Contractor shall include for all liaisons with the other Subcontractor to ascertain all project particulars relating to the following clauses.

2.2 Tender Drawings

The following tender drawings issued in relation to the works show the general arrangement of works and are indicative. These are intended as a guide to the Contractor.

Drawing Number:

Building Drawings

24/100/BW/01 Building Enabling Works Ground Floor

24/100/BW/02 Building Enabling Works Frist Floor

24/100/BW/03 Building Works – Basement/Ground Floor Structural Co-ordination Drawing

24/100/BW//04 Building Works – Roof Access and layout Detail

24/100/AP/01 Artwork & Artefacts Protection Detail - Ground Floor

24/100/AP/02 Artwork & Artefacts Protection Detail - Frist Floor

24/100/E/29 Excavations Ductwork & Foundations - External Lighting & Orangery Building

Electrical Drawings

24/100/E/01 Lighting & Power, Basement West Wing

24/100/E/02 Lighting & Power, Basement East Wing

24/100/E/03	Lighting & Power Ground Floor, West Wing
24/100/E/04	Lighting & Power Ground Floor, Central Area
24/100/E/05	Lighting & Power Ground Floor, East Wing
24/100/E/06	Lighting & Power First Floor, West Wing
24/100/E/07	Lighting & Power First Floor, Central Area
24/100/E/08	Lighting & Power First Floor, East Wing
24/100/E/09	Intruder Alarm and CCTV installation Basement West Wing
24/100/E/10	Intruder Alarm and CCTV Installation Basement East Wing
24/100/E/11	Intruder Alarm and CCTV Installation Ground Floor West Wing
24/100/E/12	Intruder Alarm and CCTV Installation Ground Floor Central Area
24/100/E/13	Intruder Alarm and CCTV Installation Ground Floor East Wing
24/100/E/14	Intruder Alarm and CCTV Installation First Floor West Wing
24/100/E/15	Intruder Alarm and CCTV Installation First Floor Central Area
24/100/E/16	Intruder Alarm and CCTV Installation First Floor East Wing
24/100/E/17	Intruder Alarm and CCTV Installation Roof - All Wing
24/100/E/18	Fire Alarm Installation Basement West Wing
24/100/E/19	Fire Alarm Installation Basement East Wing
24/100/E/20	Fire Alarm Installation Ground Floor West Wing
24/100/E/21	Fire Alarm Installation Ground Floor Central Area
24/100/E/22	Fire Alarm Installation Ground Floor East Wing
24/100/E/23	Fire Alarm Installation First Floor West Wing
24/100/E/24	Fire Alarm Installation First Floor Central Area
24/100/E/25	Fire Alarm Installation First Floor East Wing
24/100/E/26	Main Building Containment & Distribution Layout - Basement
24/100/E/27	Main Building Containment & Distribution Layout – Ground Floor
24/100/E/28	Main Building Containment & Distribution Layout – First Floor
24/100/E/29	Site Plan - External Lighting to Hall - Excavations, Ducting & Foundations
24/100/E/30	Electric Schematic Diagram - Existing Layout and Removal Requirements
24/100/E/31	Electric Schematic Diagram - New Layout
24/100/E/32	Ground Floor Central Area Existing Electrical services Locations

24/100/E/33 First Floor Central Area Existing Electrical services Locations

Note The project documentation also provides documents which highlight in photographic manner the location of both existing and new location of electrical supplies with annotated indication of how the supplies are wired. The three documents are as follows

a) Schedule of existing penetrations for new electrical containment and cables (West Wing Only)

b) Schedule of existing electrical equipment (heritage rooms) photographic annotated document

c) Schedule of new electrical equipment (heritage rooms) photographic annotated document

Note: Contractor shall co-ordinate his services alongside the principal contractor and other

Sub-contractor's drawings.

All drawings issued in relation to the works show generally the arrangement of the works under the contract and are intended as a guide to the Contractor.

Should there be any discrepancies between the tender drawings and the specification detected by the contractor, ECS Consultants shall be informed immediately, and this section of the works shall not be commenced until written instructions and the appropriate course of action have been obtained.

Tenders are to be submitted strictly in accordance with the requirements detailed on the drawings and as contained in the specification and qualifications by the Contractor will be recognised.

The Contractor shall retain on site, during all working hours, a competent foreman/site agent who shall be his fully accredited representative with authority to accept and carry out formed and authorised instructions.

The approximate positions of luminaires, accessories and all other equipment are shown on the drawings. The Contractor shall confirm all such positions with the contract administrator prior to proceeding with the work. The Contractor shall ascertain the electrical installation will not foul any other trade or services and any work re-done due to negligence will be at his own expense.
The Contractor must be fully conversant with the Health and Safety at Work Act 1974, CDM Regulations and the Control of Asbestos at Work Regulations 1987 and will be held fully responsible for all actions by his employees which contravene the aforementioned Regulations. Copies may be obtained from H.M. Stationery Office.

The Contractor shall make no claims for lack of knowledge relating to sight of Architect's, Structural Engineers, and any other specialist drawings. All related drawings are held at the offices of ECS Consultants and are available for examination.

The whole of the works shall be carried out in a workmanlike manner to the satisfaction of the contract administrator. All materials are to be adequately protected and stored and the tender price is to include for the provision of all necessary cabins required for this purpose and also welfare facilities for the Contractor's operatives.

2.3 Site Survey

The Contractor shall include to undertake a comprehensive site intrusive survey as part of the project pre-planning stage to ascertain the practical difficulties associated with the project and to include for same within their offer, as no variation of costs will be considered on the plea of insufficient information during the tender period.

The Contractor shall include during the tender stage survey, to ascertain the location of the existing grid ceilings that will require removal as part of the works.

No claims shall be entertained due to lack of knowledge relating to the existing installation.

2.4 Site Address

Site visits should be made by prior arrangement with **Mr. Tony Jones Team Leader Engineering Group, Capital Programmes, Corporate Core Directorate, Manchester City Council Mobile: 0798 531 3674 or Gerard Mitchell ECS Consultatnts on Mobile 07740100726**

The postal address of the site is

Heaton Hall,
Heaton Park,
Prestwich,
Manchester,
Greater Manchester,
M25 9WL.

2.5 Initial Detailed Intrusive Site Survey – Already Completed by Principal Contractor

The electrical contractor shall note that the principal contractor has already undertaken a detailed initial intrusive site survey on the hall to ascertain the most advantageous containment routes, main risks to the building structure and its artwork and artifacts. The survey was carried out several months ago and all information will be issued before the project planning process and discussions should be made during the tender stage with the principal contractor on the level of support he requires from the electrical contractor.

2.6 Working Drawings - To be Completed before the Project Planning Process

Three weeks prior to the commencement of any works in a specific area, the Contractor shall submit to the contract administrator's representative, detailed working drawings of all proposed cabling, accessories, and equipment inclusive of incoming heights and sizes.

These drawings shall also include sizes of all cable containment systems.

Prior to submission the drawings shall be signed and dated by the Contractor's engineer/foreman.

The Contractor shall allow a period not exceeding five working days for approval. Any points of ambiguity shall be resolved within this period.

2.7 Coordination Drawings - To be Completed before the Project Planning Process

During the production of the working drawings, the Contractor shall liaise with the other services Contractors to ensure that the drawings are fully co-ordinated.

If there are areas of the building where agreement cannot be reached these matters shall be resolved during a meeting held at the offices of ECS Consultants Limited.

This schedule shall be submitted for approval prior to the commencement of any works.

The Contractor shall ascertain the electrical installation will not foul any other trade or service. Any work required to be redone due to lack of coordination shall be carried out by the Contractor at their own expense.

2.8 Contractor General Overview of How He Will Manage and Protect the Works, Grade 1 Listed Building, Artefacts, and general Contents

The Principal Contractor shall produce a two-page written overview on how he will manage the project and highlight any perceived risks, an example is included below.

''We propose to phase the works, into 4 areas at ground floor level, and progressively move the plywood protection to both the existing timber and tiled floors from phase to phase, thus reducing the overall cost by reusing the plywood.

Similarly, the works at 1st floor will be phased and the floors will be protected as above. A photographic record of all surfaces, i.e. floor, ceilings, and walls along with the existing electrical fittings will be taken for record purposes.

When the works are complete, and the protection methods are removed a further photographic survey will be taken for future record purposes.

Access to high level work to ceiling fittings will be via mobile tower scaffolds, which will be placed on the plywood mentioned above. We intend to protect the floors by use of 6mm plywood, both to the work area and also the adjacent corridors which will be used for the access and egress of men, materials, and scaffold towers. The plywood being a robust material to withstand the movement of the scaffold tower wheels and negating any potential damage to the existing floors.

With the position of electrical fittings over the existing billiard table we have met with our scaffolding contractor and shall form a scaffold structure over the table, which will be planked out and covered in 6mm plywood to ensure no dust or debris can fall onto the table. On top of this scaffold structure, we shall place a tower scaffold to allow high level access to the works at ceiling level.

We intend to use the minimum of intervention when protecting the artefacts, i.e. instead of cladding over the artefacts, we intend to limit access to the artefact by erecting physical barriers, eg chapter 8 barriers and providing dedicated walkways on the plywood floor protection ensuring there is a suitable distance away from artefacts, walls, columns etc. to ensure no damage can be caused. We see this being the correct approach as any boxing or cladding over wall mounted mirrors book cases and paintings etc, will impact on the surrounding wall finish, and by not doing these works we are totally negating the risk of damage.

Because of the nature of the works we do not envisage having large numbers of men on site, however there will be areas we have identified in our visits to site , where for instance due to narrowness of the opening between the 2 columns, between the Ante Room to the Library and the Library itself we intend to wrap the columns in several layers of bubble wrap which will provide protection from possible impact damage as work men pass through.

As there will be works at high level over the main staircase, we shall wrap the handrail and balusters to the staircase in several layers of bubble wrap. With regard to the statue in the Grand Staircase area we shall provide timber boxing to this (NB we shall use the same timber boxing which has previously been used in previous schemes as we are told this has been stored on site.)

We have spent several weeks carrying out surveys on site to identify existing cable runs and existing floor boards which have previously been removed. It is our intention to use the operatives who have carried out this survey work to provide the main rewire and joinery works, thus providing continuity of the knowledge gained during the surveys.''

2.9 Site Meetings

The programming of meetings shall be decided by the contract administrator and Principal Contractor to the mutual convenience of all parties.

2.10 Approval of Materials

Prior to the procurement of any materials, the Contractor shall submit a schedule of all accessories, equipment, complete with relevant manufacturers for final comment.

2.11 Product Samples

Prior to the procurement of luminaires and accessories, the Contractor shall include to provide product samples for final Client comment.

All samples shall be presented within three weeks of the contract being awarded.

2.12 Quotations

Whilst every endeavour has been made to ensure the accuracy of quotations from suppliers were produced for numbered schedules, ECS Consultants cannot guarantee their accuracy. It is the responsibility of the Contractor to ensure the accuracy of part references, quantities, etc., and make do allowance within the tender

2.13 Final Positions

Prior to setting out the position of any accessory the Contractor shall obtain confirmation in writing from the Principal Contractor / Contract Administrator that the details they are working to are correct and current and where confirmation is to be sought shall be obtained prior to installation.

Any claim for lack of information due to incorrect setting out or any other reason whatsoever will not be considered.

The Contractor shall note the position of all accessories, as detailed on the appropriate drawings. The final locations shall be determined by a site walk around with the Contract Administrator, Project Architect and Client.

The Contractor shall note that any deviations from the ECS drawings up to 2000mm either side horizontally/vertically of the accessory position shall be carried out at the Contractor's own expense.

2.14 Approval of Sub-Contractors

The Contractor shall compile a complete schedule of all sub-Contractors they propose to employ the services of during the contract.

This schedule shall be submitted for comment prior to the commencement of any works.

2.15 Programme of Works/Access Arrangements

The Contractor shall include to issue a detailed programme of works inclusive of all agreed key dates to the Contract Administrator. This shall take into account any special restrictions to work as detailed in Project Phasing Document enclosed within this specification.

Due to the nature of the works, we do not envisage that the contractor has a large number of men on site, to allow the management of the building including both fire and security to be managed and remove the risks of damage, however there will be areas such as the burnt out west wing that may be more suited for larger teams to work.

The contractor shall note that weekend working is to be allowed in the submitted "programme of works" with approval of the Contract Administrator.

2.16 General Installation

Generally, works shall be carried out as agreed with the Principal Contractor and Contract Administrator.

2.17 Key Dates and Contract Conditions

The Contractor shall note that the installation key dates shall be in line with the project preliminaries.

The Contractor shall include to liaise with the principal contractor during the tender period to ascertain their Contract Terms.

The Contractor shall include within their tender all associated costs with complying with the principal contractor's Contract Terms.

The Contractor shall include to liaise with the principal contractor during the tender period to determine start and completion dates.

2.18 Instructions

The Contractor is reminded that instructions must only be accepted in keeping with Contract procedures.

Instructions or directions shall not be accepted from unauthorised parties and if in doubt shall be verified by the Principal Contractor. Any work carried out at the request of an unauthorised source will be at risk.

2.19 Project Management Report

The Contractor shall include to provide a two-weekly report to the Contract Administrator during the first fix/second fix/commissioning phase of the project. This shall be typewritten and not longer than two sides of A4 paper. This shall comprise of: -

(i) Progress
(ii) H & S incidents
(iii) Client liaison
(iv) Sub-Contract Issues
(v) Technical Queries

Each report shall be complete with a minimum of ten colour photographs of the current area being worked upon.

2.20 Health & Safety, Training and Recording Using Photographic Evidence

The Contractor shall include to provide and install safe systems of work to all contractor staff, visitors, and protection of the building at all times. The contractor shall include.

- Maintain a small experience team to carry out the works in a phased programme working in no more than fours areas at any one time
- Install a strict and regular induction/toolkit training to all staff and visitors with the focus on working in a grade 1 listed building and protection of the building and artefacts
- Contractor to issue a package if in depth risk assessments, method statements, training certification and records of staff
- Contractor to carry out and issue a photographic record of all surfaces, (floors, walls, and ceilings) all artefacts, pictures and fixtures including heritage lighting – Upon completion of each phase a further round of photographic evidence shall be produced and issued to the contract's administrator this should include the contractor protection methods for each room.

3. SCOPE OF WORKS

3.1 General

The Principal Contractor shall be reasonable for all protection of artwork, artefacts, flooring, marble columns, doors, fireplaces, drilling, fire protection etc, complete with the electrical services which shall be in accordance with the drawings and specifications and shall consist of the supply, installation, connection, testing and commissioning of:

(i) Utility Services Infrastructure
(ii) Band 1 Cabling and Containment
(iii) Band 2 Cabling and Containment
(iv) Life Safety Systems
(v) Mechanical Plant Wiring

The Contractor shall include to have read at tender stage, all information relating to the architectural, structural, and mechanical services proposals and to be fully aware of the extent of the works required.

All materials and items of equipment are to be of the same manufacturer of their various types in order to standardise and simplify maintenance and replacement.

Tenders are to be submitted strictly in accordance with the requirements detailed on the drawings and as contained in the specification and qualifications by the Contractor will be recognised.

3.2 Key Principles on Working Within the Hall

The Principal Contractor shall include in his tender submission the costs of carrying out all works in line with complying with the listed key principles of working at Heaton Hall the key principals are as follows.

- All equipment and wiring will be of the type to be sympathetic to the grade 1 listed building, the client and conservation officer will be consulted throughout the design and installation process.
- Permissions as required from MCC Planning Department, Conservation Officers, Building Control, Historic England, and Georgian Society colleagues will be sought as required for the works prior to any works being commenced on the building.
- All works will be carried out by contractors with experience of working on listed buildings and a record of completing works to a high standard.
- Any building works (including floor void access) will be carried out by suitably qualified and specialised tradesman again with experience of working on listed buildings.
- Existing plaster should not be chased to install as a flush installation, MCC listed building officer have confirmed their preference and instruction that the new installation and accessories be clipped surface, and which can be easily removed in future rather than intrude on the building fabric
- New electrical outlets should be surface mounted or flush within the skirting board if existing outlets have already been installed in the skirting board
- Electrical cables will be best suited for key areas/rooms are to be bare MICC cable painted to match existing finish paint finish. Listed building office expects limited amount of MICC cabling to be seen and careful location of sockets, intruder alarm detectors etc. will need to be agreed
- Contractor's plant and equipment shall be suitable to use in a Grade 1 listed building having both vibration and dust control and screening protection where decorative and historic paintings and artefacts are present.
- Contractors shall include to supply and install hard protective flooring on up to four rooms at a time and additional dust layer where mobile scaffolding are to be used in the ground and first floor areas. All scaffolding shall have catch fans or safety nets to ensure nothing falls from height onto the artefacts or flooring. **Note** MEWP's will not be allowed on site without the contract administrator approval.

3.3 Specific Areas

Floorboards – Within Heaton Park Hall, there are a number of types of floor boarding systems ranging from wide to narrow floorboards. Upon examination, it has been determined that the existing floorboards are pinned together using timber dowels.

Where any new floorboards need to be removed, approval of the Contract Administrator is required. It is proposed that the removal of these boards is undertaken in line with the Historic England guidance relating to the removal of this type of flooring system. This involves a narrow cut into the existing timber dowels, allowing the floorboards to be removed.

However, the contractor shall note that during the consultant's survey it was noted that existing floorboards have been removed in many locations. These were logged and highlighted on the appropriate tender drawings.

However, the contractor shall include to carry out a detailed intrusive survey check the tender drawings and initially map the locations where floorboards have been removed so that cable routes can be selected which will allow these floorboards to be removed and replaced again, thus minimising damage to floorboards that have never been removed.

CAD drawing developed showing both existing and new requirements. This is in line with the CIBSE guide to 'Building Services for Historic Buildings' recommendations.

The following photograph shows a partially removed floorboard complete with a timber dowel:



3.4 Installation Methods for Electrical Rewire

The contractor shall note and include for all building and the various adaptations required to allow the electrical sub-contractor to install his installations methods to a number of different requirements as described below.

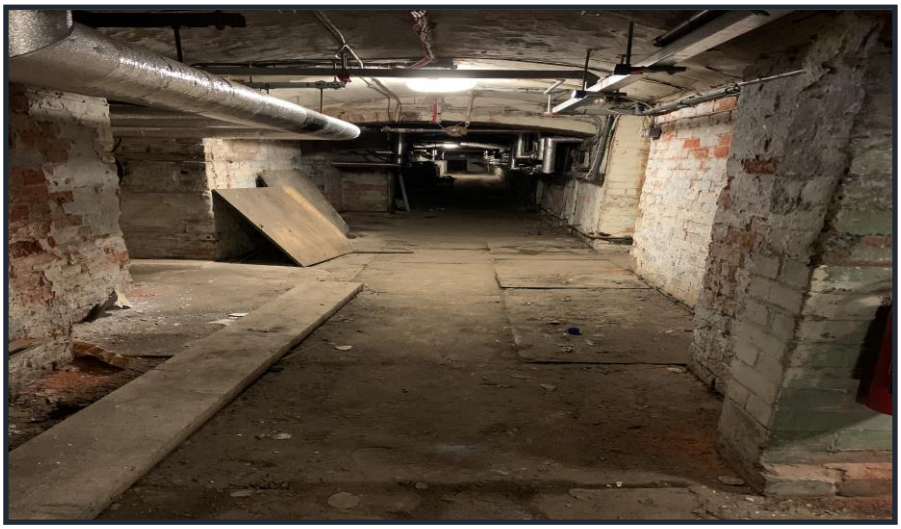
- The careful removal and making good will need to be taken of the existing surface mounted cables particularly intruder alarm currently fixed to windows and architraves.

- **First Floor Servants Quarters** – this area requires a large amount of future restoration however the electrical installation still requires to be treated as a permanent installation and be surface mounted where possible using bare MICC cablers clipped directly for the power outlets and 6242 LSZH twin+ earth cables installed in the roof void on containment to serve heritage lightning luminaires. Any down drops to switches etc will be in galvanised conduit to rocker switch



- **Installation within the roof void** - shall be 6242 LSZH twin+ earth cables laid on galvanised cable basket tray installed above the joists to allow future roof insulation to be installed. Cable basket tray will include bare MICC cable for general power, with FA cables and Intruder/Data cables on separate trays.

- **Basement area -** Lighting will be bulkhead LED type luminaire and for the electrical installation main containment routes 6242 LSZH twin+ earth cables laid on galvanised cable basket tray and within metal conduit. The FA and Intruder/Data cables will have separate tray. **–** final installation to electrical accessories will be either galvanised conduit/trunking surface mounted for the basement electrical installation



- **Vacant /Fire Damaged Areas including the Bakery Building –** areas such as the fire damaged wing will have limited installation and requires installing FP200 Red and White cables laid on galvanised cable basket tray. Fire and Intruder alarm cables will have separate tray clipped direct and any short final runs shall be installed direct to damage fabric with galvanised conduits as final droppers.



- **Orangery Area –** Works only include for a new electrical supply and metering complete with switch fuse and distribution board in one location - no final circuits to both lighting and general power to be installed. However new Fire, Intruder Alarm and CCTV services are also be included and installed surface on cable tray and direct to the building structure.



Note – The client has two separate projects being carried out at the same period, the electrical rewire of the main building and the refurbishment of the Orangery. The contractor should note that part of the electrical rewire programme certain key items of works will be required to be carried out as part of the rewire. They are.

1. Installation of Electrical Containment within the Orangery
2. Installation of new electrical sub-mains, sub metering, main TP&N distribution board
3. Installation of new fire and intruder alarms as per the tender drawing
4. Installation of new CCTV system within the orangery

3.4 Proposed Electrical Installation & Method of Wiring and Containment

The Hall as described above is a three-story masonry constructed building and consists of five key areas that are off various different condition of building and its environment, each area will require different type of installation and care.

The areas are as follows.

FORMER BAKERY BUILDING –

This area was the location of the Hall's main bakery, the building has suffered extensive damage over the years and currently has the exposed brickwork and timber joists.

Electrical Installation Proposal

It is proposed to treat this area as a temporary installation until funding is found to bring the area back to its previous historic condition and use. As part of the electrical safety improvement works this area will have the following new installations.

a) IP65 general LED bulkhead lighting providing amenity lighting with integral absence detection and self-contained emergency lighting will be provided in key areas such as circulation routes and in rooms that have both fire and security detection which will require servicing throughout the year to provide improved health and safety compliant access for the maintenance contractor.
b) Small Power Installation general IP65 RCD socket outlets in corridor areas
c) Addressable Fire Alarm system and devices linked back to the main panel located in the centre block.
d) Intruder Alarm Installation covering all key areas of security and known risks of entry.

The method of wiring and containment in the West wing will be as follows.

- FP200 Red cable installed in galvanised cable basket and clipped on timber joists and protected by PVC conduit droppers on bare brickwork for the Fire Alarm installation.

- FP200 White for general lighting which are surface mounted installed in galvanised cable basket, clipped on timber joists and protected by PVC conduit droppers on bare brickwork.
- FP200 White for general power serving the IP65 RCD controlled sockets outlets which are surface mounted installed in galvanised cable basket, clipped on timber joists and protected by galvanised conduit droppers on bare brickwork.
- Intruder Alarm cable will be screen alarm cable duct grade BS4737-3.30 as Type 2 but PE sheathed installed in galvanised cable basket and clipped on timber joists.

Note - All fixings on the bare brickwork shall be in the mortar not the brickwork.

WEST WING –

This area was the location of the Hall's main kitchen, garden café and a number of large storage areas, the building suffered extensive fire damage in the 1960's with currently still has the exposed brickwork and timber joists.

Electrical Installation Proposal

It is proposed and agreed with MCC heritage architects to treat this area as a temporary installation until funding is found to bring the area back to its previous historic condition and use. As part of the electrical safety improvement works this area will have the following new installations.

e) IP65 general LED bulkhead lighting providing amenity lighting with integral absence detection and self-contained emergency lighting will be provided in key areas such as circulation routes and in rooms that have both fire and security detection which will require servicing throughout the year to provide improved health and safety compliant access for the maintenance contractor.
f) Small Power Installation general IP65 RCD socket outlets in corridor areas
g) Addressable Fire Alarm system and devices linked back to the main panel located in the centre block.
h) Intruder Alarm Installation covering all key areas of security and known risks of entry.

The method of wiring and containment in the West wing will be as follows.

- FP200 Red cable installed in galvanised cable basket and clipped on timber joists and protected by PVC conduit droppers on bare brickwork for the Fire Alarm installation.
- FP200 White for general lighting which are surface mounted installed in galvanised cable basket, clipped on timber joists and protected by PVC conduit droppers on bare brickwork
- FP200 White for general power serving the IP65 RCD controlled sockets outlets which are surface mounted installed in galvanised cable basket, clipped on timber joists and protected by galvanised conduit droppers on bare brickwork.
- Intruder Alarm cable will be screen alarm cable duct grade BS4737-3.30 as Type 2 but PE sheathed installed in galvanised cable basket and clipped on timber joists.

Note - All fixings on the bare brickwork shall be in the mortar not the brickwork.

CENTRAL BLOCK –

This area is the location of many of the key rooms and ornate design of the building with the majority of rooms having deep skirting boards, plaster dado and picture rails and deep ornate cornice details particular the lighting.

Electrical Installation Proposal

It is proposed to treat this area as a high-risk area on the management and delivery for the electrical installation and protection of the historic part of the building and associated artefacts. As part of the electrical safety improvement works this area will have the following new installations.

a) Heaton Park Hall benefits from a number of ornate luminaires. These vary from ceiling hung chandeliers to uplighters incorporated into the wrought iron steel balustrades forming part of the grand staircase.
It is proposed as part of these works for these luminaires can either be removed from site, rewired, and refurbished with energy efficient lighting or worked upon on site in a secure workshop area. We have included for the historic ornate luminaires to provide emergency lighting facility through a static inverter installation.
b) New historic type luminaires will be installed in a number of areas which are suitable for the building period but with have integral 3hr emergency facility and PIR absence detection
c) Small Power Installation generally 2No dual socket outlets in each room, with fixed supplies to power supply units for the fire safety and security systems
d) Addressable Category L1 Fire Alarm system and devices linked back to the main panel located in the centre block main office The system will be a hybrid using hard wired and wireless integration to remove areas of installation in ornate areas.
e) Intruder Alarm Grade 3 Installation covering all areas of security of the internal rooms and externally the roof area which have known risks of entry.
f) CCTV system and cameras covering the main central and east wings of the building particularly the ground and first floors rooms. The devices are small I.P turret type cameras that can be ceiling or wall mounted and are powered P.O.E.

The method of wiring and containment in the West Wing will be as follows.

- General Lighting – 6242 LSZH twin+ earth cables and on occasions FP200 White cable installed on galvanised cable basket, under floorboards, above ceiling voids, clipped on timber joists and protected by galvanised conduit/ trunking where cable drops down to distribution boards on bare brickwork.
- General Power – bare MICC cable installed in galvanised cable basket in agreed risers, under floorboards, in ceiling voids and clipped on timber joists and skirting boards using the existing locations where possible not to damage any further existing fabric.
- Fire Alarm Installation - FP200 Red cable installed in galvanised cable basket in agreed risers, under floorboards, in ceiling voids and clipped on timber joists.
- Intruder Alarm cable will be screen alarm cable duct grade BS4737-3.30 as Type 2 but PE sheathed installed in galvanised cable basket in agreed risers, under floorboards, in ceiling voids and clipped on timber joists.
- CCTV Cat 6 Cable installed in galvanised cable basket in agreed risers, under floorboards, in ceiling voids and clipped on timber joists.

Note - All fixings on the bare brickwork shall be in the mortar not the brickwork.

EAST WING –

This area is the location of a number of the key rooms with ornate design of the building with the majority of rooms having deep skirting boards, plaster dado and picture rails and deep ornate cornice details which shall be treated as the central block.

There is a (small wing on the first floor) that has been originally given over to children and staff and is in generally poor state and in need of detailed refurbishment and conservation and weather protection works. This space has a much lower floor-to-ceiling height with limited decoration, comprising only of shallow cornices. The ceiling in all areas is of lath and plaster construction.

It is proposed still to treat this first-floor area as a permanent installation with limited electrical outlets and services until funding is found to bring the area back to its previous historic condition and use. As part of the electrical safety improvement works this area will have the following new installations.

a) Decorative Heritage lighting providing amenity lighting with stand-alone absence detection and self-contained emergency lighting will be provided in all areas of this first-floor wing.
b) Small Power Installation - generally dual MK brass or bronze surface mounted socket outlets in rooms and corridor areas, 13Amp DP switch spur units to serve a small number of Dimplex panel heaters which shall be supplied in the future to provide some form of heating to reduce the dampness in certain rooms.

c) Addressable Fire Alarm system and devices linked back to the main panel located in the centre block.
d) Intruder Alarm Installation covering all key areas of security and known risks of entry.

The method of wiring and containment in the east wing first floor will be as follows.

- Lighting - 6242 LSZH twin+ earth cables and on occasions FP200 White cable installed on galvanised cable basket, under floorboards, above ceiling voids, clipped on timber joists and protected by galvanised conduit/ trunking where cable drops down to distribution boards on bare brickwork.
- General Power – bare MICC cables installed in galvanised cable basket, below floorboards, above ceiling voids and in galvanised conduit or trunking where vertical drops are required for the general socket outlets - bare MICC cable as above for east wing ornate rooms.
- FP200 Red cable installed in galvanised cable basket and clipped on timber joists and protected by galvanised conduit droppers on bare brickwork,
- Intruder Alarm cable will be screen alarm cable duct grade BS4737-3.30 as Type 2 but PE sheathed installed in galvanised cable basket and clipped on timber joists.
- CCTV Cat 6 Cable installed in galvanised cable basket in agreed risers, under floorboards, in ceiling voids and clipped on timber joists.

Note - All fixings on the bare brickwork shall be in the mortar not the brickwork.

ORANGERY -

The Orangery is located as part of the east wing of the ground floor and was previously a Café and training centre for the Manchester City Council with catering facilities. This wing is of single-storey construction with a flat roof. All services within this area are currently exposed with cables clipped direct. As part of the electrical safety improvement works this area will have the following new installations.

a) New electrical sub mains cable and local electrical distribution boards are to be provided with a suitable electrical load assessment for a new Café and catering development in the future.
b) Addressable Fire Alarm system and devices linked back to the main panel located in the centre block.
c) Intruder Alarm Installation covering all key areas of security and known risks of entry.

Note – No general lighting, emergency lighting, general power, CCTV, PA, and Data systems are to be installed as part of the electrical safety works.

4. CONTAINMENT WIRING SUPPLIES AND METHODS OF INSTALLATION

4.1 General

The Contractor shall include to supply and install 6242 LSZH cables installed within ceiling voids tied to a system of cable basket and then installed in PVC compartment trunking in majority of areas.

In plant rooms and external stores 6491B cables drawn through a system of galvanised steel trunking and galvanised steel shall be utilised.

The Contractor shall note that the supply to the new distribution boards shall comprise of XLPE/SWA/LSF cable tied to a system of cable tray.

The Contractor shall note that the majority of areas shall benefit from the installation of grid ceilings. In these areas, 6242 LSZH cabling shall be installed.

These cables shall be tied to a system of cable basket. Where they peel from the basket, they shall be drawn through PVC conduit within the ceiling voids, installed flush down walls to outlet positions.

4.2 LSZH and 6491B Cables

The general method of installation for final circuits where grid ceilings do not exist shall be 6491B cables drawn through a system of galvanised steel trunking and high impact galvanised steel conduit.

Where grid ceilings exist, 6424 LSZH cables shall be installed in all other areas.

The 6491B and 6242 LSZH cables shall be manufactured to BS 6004:2012 and 6491B cables shall be stranded copper conductors.

Where 6242 LSZH cables are used they shall be installed within ceiling voids tied to a system of cable basket. This system shall be utilised for classroom areas with impact PVC conduit droppers.

Cables are to be secured at distances not exceeding those detailed in the I.E.T. Regulations with standard pin type clips or other approved fastenings to suit cable requirements.

In locations where cable runs are not normally visible (ceiling voids, etc.) plastic wrap around type clips may be employed, but this must be agreed with ECS Consultants before commencement.

Where cables are routed down walls, they shall be drawn through high impact white PVC conduit.

Cable routes are to be chosen such that the cables are kept away from hot water and/or gas pipes, dripping water, steam condensate or other substances likely to impair the insulation of the cable. In no circumstances is the cable to be installed in a situation where the air temperature in the vicinity of the cable would exceed 40^{o}C.

On no account are LSZH cables to be brought into tungsten luminaires or any item of equipment where they might be exposed to temperatures higher than 40^{o}C.

Where cables are used to supply any apparatus, luminaires, etc., subject to high temperatures, the final connection s and, or through wiring, shall be carried out with silicon-rubber insulated single cable to BS 3258, 600/100-volt grade. The PVC/silicon-rubber cable joint shall be made at a conduit box at an accessible position not subject to the high temperature using a fixed porcelain connector.

LSZH cables are not taken through any luminaire but, should it be necessary due to practical considerations, to bring this type of cable into a luminaire, the PVC insulation is to be removed and the conductor fitted with insulating sleeve or beads suitable for high temperature operation, and installed in such a way that a short circuit between conductors and/or connections and earth is impossible. (The Sub contractor is to note that this is also applicable to single core cables).

Where cables are run through metalwork, or switchgear and/or accessory boxes including adaptable or BESA boxes, there are to be bushed to prevent abrasions to the cables.

All holes in metal boxes shall be bushed before entry using insulated nylon ring lock bushes, fibre insulated threaded make bush with fibre locknut, or if agreed by ECS Consultants by plastic rubber grommets. At all conduit or adaptable boxes, the bush is to be of the screw-in compression gland type.

Cables entering switches, switchgear or accessories shall be prepared to ensure that no unsheathed portion of the cable is showing outside the item of equipment concerned.

Where cables run through partition walls, ceiling and/or floors, the holes are to be made good to the full thickness of the floor/wall etc. If the cable passes through fire resistant structural elements, fire resistant materials must be used to make good the hole. In these positions the cables must be suitably protected against mechanical damage.

Holes in metal partitions shall be bushed to prevent cable sheath abrasion.

Throughout the installation on single phase circuits all phase conductors shall be coloured brown, and all neutral conductors coloured blue. Blue coloured cable cores at lighting control switches shall not be used. Neutral conductors must not be routed through switch boxes.

Where cables are tied to traywork or cable basket they shall be tied using nylon cable ties with metallic cable ties every two metres.

Cables shall be bunched in forms of no more than four cables.

Cables shall be manufactured in accordance with BS 6004:2012 Electric Cables PVC Insulation and PVC sheathed cables for voltages up to and including 300/500v for lighting and power.

Where cables are routed through or down exposed brick or block walls to outlet positions, they shall be enclosed within a system of PVC containment systems finished colour to match the building fabric.

Where cables are installed under a floor or above a ceiling it shall be run in such a position that it is not liable to be damaged by contact with the floor or ceiling or the fixings thereof.

A cable passing through a ceiling support shall be at least 50mm from the top or bottom, as appropriate, or be enclosed in earthed galvanised steel conduit or trunking.

New holes in ceiling supports shall be no greater diameter than 0.25 times the depth of the support, drilled at the neutral axis, not less than 3 diameters apart and located between 0.25 and 0.4 times the span from the support.

Where cables are to be installed flush within the building fabric at a depth less than 50mm from the surface, cables shall be protected via galvanised steel cable capping which shall be earthed by means of a 4mm² cable lug fixed via a 2BA brass nut and bolt arrangement. A 4mm² 6491B earth cable shall then be connected to a local accessory box, and the same arrangement linked to the cable basket within the ceiling void. The cable capping shall be manufactured by Trident sections telephone number 01384 401600 or equal and approved.

Where cables are to be installed flush within the building fabric, they shall be installed either horizontally within 150mm of the top of the wall or partition or vertically within 150mm of the angle formed by two walls, or run horizontally or vertically to an accessory or distribution board.

Where cables are to be installed flush within the building fabric, vertical chases shall be no deeper than one third of the wall thickness or in cavity walls one third of the thickness of the leaf and horizontal chases shall not be deeper than one sixth of the thickness of the leaf or wall.

All chases shall not be positioned as to impair the stability of the wall, particularly where hollow blocks are used.

The Contractor shall note that where cables are routed through metal framed walls the cables shall be protected using earthed metallic flexible conduit, or Armourflex cable ref SY to BS6500, flexishield or similar and approved.

The metallic sheath of either the earthed metallic flexible conduit or armourflex shall be earthed to the accessory box by means of a metallic gland and approved earth connection.

Where cables installed within walls or partitions containing metal parts, regardless of depth, the Contractor shall provide provision of additional protection by RCD’s having rated residual operating current not exceeding 30mA.

Where mobile equipment with a current rating not exceeding 32A for use outdoors is installed the Contractor shall provide provision of additional protection by RCD’s having rated residual operating current not exceeding 30mA.

The Contractor shall provide provision of additional protection by RCD’s having rated residual operating current not exceeding 30mA for all socket outlets.

Where cables are installed within walls or partitions at a depth less than 50mm the contractor shall provide provision of additional protection by RCD's having rated residual operating current not exceeding 30mA.

All cables installed within escape routes shall be supported by metallic fire resistive supports such that they will not be liable to premature collapse in the event of a fire.

This precludes the use of non-metallic cable clips, cable ties or cable trunking as the sole means of support. Where non-metallic containment is used, a suitable fire-resistant means of support must be provided to prevent cables falling out in the event of a fire.

Wiring systems in escape routes shall be as short as practicable.

Cables shall be non-flame propagating. Compliance with this requirement is ensured by the cable meeting the relevant part of the BSEN 60332-3: 2009 Tests on electric and optical fibre cables under fire conditions.

Cables shall be selected and erected as to be suitable for the highest and lowest local ambient temperature in normal operation and under fault conditions.

Cables are to be secured at distances not exceeding those detailed in the I.E.T. Regulations with standard pin type clips or other approved fastenings to suit cable requirements.

In locations where cable runs are not normally visible (ceiling voids, etc.) plastic wrap around type clips may be employed, but this must be agreed with ECS Consultants before commencement.

Cable routes are to be chosen such that the cables are kept away from hot water and/or gas pipes, dripping water, steam condensate or other substances likely to impair the insulation of the cable. In no circumstances is the cable to be installed in a situation where the air temperature in the vicinity of the cable would exceed 40^{o}C.

On no account are LSZH cables to be brought into tungsten luminaires or any item of equipment where they might be exposed to temperatures higher than 40^{o}C.

Where cables are used to supply any apparatus, luminaires, etc., subject to high temperatures, the final connections and/or through wiring, shall be carried out with silicon-rubber insulated single cable to BS 3258, 600/100-volt grade. The PVC/silicon-rubber cable joint shall be made at a conduit box at an accessible position not subject to the high temperature using a fixed porcelain connector.

LSZH cables are not taken through any luminaire but, should it be necessary due to practical considerations, to bring this type of cable into a luminaire, the insulation is to be removed and the conductor fitted with insulating sleeve or beads suitable for high temperature operation, and installed in such a way that a short circuit between conductors and/or connections and earth is impossible. (The Contractor is to note that this is also applicable to single core cables.)

Where cables are run through metalwork, or switchgear and/or accessory boxes including adaptable or BESA boxes, there are to be bushed to prevent abrasions to the cables or glanded using manufacturers approved arrangements.

All holes in metal boxes shall be bushed before entry using insulated nylon ring lock bushes, fibre insulated threaded make bush with fibre locknut, or if agreed by ECS Consultants by plastic rubber grommets. At all conduit or adaptable boxes, the bush is to be of the screw-in compression gland type.

Cables entering switches, switchgear or accessories shall be prepared to ensure that no unsheathed portion of the cable is showing outside the item of equipment concerned.

Where cables run through partition walls, ceiling and/or floors, the holes are to be made good to the full thickness of the floor/wall etc. If the cable passes through fire resistant structural elements, fire resistant materials must be used to make good the hole. In these positions the cables must be suitably protected against mechanical damage.

Holes in metal partitions shall be bushed to prevent cable sheath abrasion as detailed for metallic boxes, reference shall also be made to the protection of cables via earthed metallic containment systems or the Contractor shall provide provision of additional protection by RCD's having rated residual operating current not exceeding 30mA.

Throughout the installation on single phase circuits all phase conductors shall be coloured brown, and all neutral conductors coloured blue. Blue coloured cable cores at lighting control switches shall not be used. Neutral conductors must not be routed through switch boxes.

4.3 Galvanised Steel Cable Tray

All galvanised steel cable tray shall be installed within ceiling voids and exposed in areas where there is no ceiling finish, suspended on a system of screwed rod suspensions.

The cable tray shall be complete with manufacturer's jointing pieces and shall be terminated within 100mm of each dropper position.

Within the corridor glazed area where tray work is exposed it shall be finished in stainless steel. In all other plant room areas, a standard galvanised steel finish shall be applied.

The Contractor shall note separate traywork systems shall be installed to accommodate band one final and distribution circuits, band two circuits and fire alarm loops. The Contractor shall note that totals to four number dedicated containment systems.

The Contractor shall supply and install SRF heavy duty galvanised steel cable tray for distribution circuits, MRF medium duty galvanised steel cable tray for both final circuits and band two circuits and SS light duty galvanised steel cable tray for fire alarm loops. In exposed areas of the office stainless steel traywork shall be installed for all circuit board types.

All cables on traywork systems shall be tied using nylon cable ties. The ties shall support the cables with all excess ties cut off. A system of metallic cable ties shall be employed every two metres.

All cables shall be bunched up to a maximum of four cables. These groups of cables shall be separated by a distance equal to that half of the bunched arrangement.

The Contractor shall note that specific clauses relating to workmanship are detailed in the General Specification.

4.4 Galvanised Steel Conduit and Trunking

The general method of installation within plant rooms, store areas or any areas where there are exposed brick block or partition walls shall be LSZH 6491B stranded cables drawn through a system of galvanised steel trunking and conduit or flexible steel conduit as agreed by the Contract Administrator.

Steel conduit and conduit accessories shall be manufactured in accordance with the relevant BSS.

All steel conduits shall be heavy gauge, screwed and welded. Conduit shall be galvanised steel (class 4) finish.

Fittings and accessories shall be provided to match the conduit to which they are attached.

The minimum size of conduit shall be 20mm diameter.

Conduit fittings for steel conduit shall be malleable iron. Conduit boxes shall be of the pattern having long screwed spout outlets except for back-outlet loop-in pattern which shall have plain clearance hole entries.

Adaptable boxes shall generally be of the sheet steel pattern. All conduit box bushes glands etc. shall be manufactured from brass.

Saddles for surface mounted conduit shall be of the distance type, fixing for conduit buried in floor or roof screed and conduit in wall plaster may be of the crampet or plain saddle type.

All conduit boxes or adaptable boxes serving as outlets for accessories or luminaries shall be fitted with an earthing terminal.

Conduits shall be concealed wherever practicable, but where they are run on the surface of walls, ceilings, etc., they shall be installed in a neat and workmanlike manner.

The conduit system shall be carefully planned and erected to avoid all unnecessary bends, sets or changes of direction. Conduits shall be laid in straight and symmetrical lines with easy machine-made sets or bends at angles. Where multiple runs of conduit change direction the radii of the bends or sets shall be laid out from a common centre and where draw-in points are required at right angle changes of direction of multiple runs, adaptable boxes shall be used. Not more than two right angle bends, or not more than four sets shall be installed between consecutive draw-in or inspection boxes. Bends and sets shall be made cold, and the conduits shall not sustain any reduction of cross-sectional area. Where possible, adaptable boxes shall be positioned in Store Room and other situations where they are less conspicuous.

All bends must be made on site by means of bending machines; factory made bends will not be permitted for any conduit unless prior permission is first obtained.

Solid or channel inspection elbows, bends or tees will not be permitted where standard BSS boxes will suffice. Where conduits are to be worked around beams approved back inspection elbows, tees or boxes may only be used with the consent of the Contract Administrator.

All conduits and accessories shall be installed with sufficient and adequate fixing in a slightly and workmanlike manner so as to comply with good general practice. All fixings must be made using brass or plated steel screws to prevent rusting and must be entirely independent of any cement or plaster for security of fixing.

Conduits run on exposed surfaces and walls shall be securely fixed at intervals of not more than 1.2 metres horizontally by distance saddles to give a clearance of 5mm from the surface.

Vertical conduit runs shall have saddles fixed at distance of not more than 300mm from their point of emergence with floors or ceilings and further saddles shall be fixed consistent with the requirements of spacing and appearance. Saddles shall be fixed on each side of every bend at a distance of not more than 300mm form the points of intersection of the centre line of the conduits. Multiple saddles shall be used for parallel runs of two or more conduits. Conduit boxes shall be securely fixed independently of conduit fixings.

Conduit shall be installed to give a minimum clearance wherever possible of 150mm between gas, water, steam pipes, etc., and where this is not possible all service pipes including the conduit system shall be adequately bonded together in accordance with the I.E.T. Regulations. They shall not be run in the same duct or trench as gas pipes.

As far as possible provisions for effectual "draining off" of all conduits must be made so as to prevent the accumulation of moisture within them, whether derived from condensation or any other sources. Drainage holes or T boxes with short length spout outlets shall be used at the lowest part of the conduit system to allow ventilation of the wiring and drainage, exact location of drainage hole to be agreed on site with the Contract Administrator.

In positions where the appearance of the conduit run is likely to be improved by the introduction of dummy lengths of conduit and in all positions where a more secure fixing for the suspension of equipment, light fittings, etc., would be obtained by extending the conduits beyond their normal terminations, such dummy conduits and extension shall be provided.

Unless otherwise specified, conduit run to a bulkhead lighting point shall terminate at a standard circular conduit box and conduit run to a fluorescent lighting point shall terminate at two standard circular conduit boxes at the fixing centres of the fitting.
During building construction work, all open ends of conduits shall be blanked off with female screwed metal plugs. All entry holes to boxes, accessories etc., shall be blanked off with screwed metal plugs.

The inside surface of all conduits and the ends of the conduits and fittings used shall be smooth, free from rust, burrs, and all other defects. During the erection of the conduits the ends are to be well reamed out.

Before fitting earth clips to conduits, the enamel shall be removed from the contact area and the connection painted with aluminium or red oxide paint immediately on completion.

The conduit is to be properly and tightly screwed between various lengths and into the fittings, apparatus, boxes, etc., into which it runs or terminates, so that the wiring is continuously and effectively protected throughout its whole length and so that the conduit system is electrically and mechanically continues throughout, and is in no part under mechanical stress. Conduits shall be threaded so that a gap of approximately 3mm is left between ends in couplings and sockets. The ends shall be filed square, carefully reamed to removed burrs and all traces of oil or grease removed. No threads shall be exposed except at running coupling and the use of such couplings shall be reduced to a minimum. Exposed threads shall be painted with good quality rust resistant paint as the job progresses.

Screwed joints in galvanised conduit runs and at associated draw-in boxes etc., shall be made watertight using a good quality red oxide or aluminium paint, gaskets, or other approved method. The joints shall be partially screwed up before paint is applied so that the electrical continuity is maintained.

Joints between conduits and equipment or fittings provided with clearance holes, which must be correct size for the conduit used, shall be made by means of locknuts and female bush or couplings and smooth bore male bushes. The contact surfaces of all couplings shall make good electrical contact.

Smooth bore male bushes shall be tightened by means of spanners and mutilated or marked bushes shall be replaced.

Conduits throughout shall be of sufficient diameter and so arranged with draw-in boxes to permit easy draw-in or removal of one or all cables. Under no circumstances shall the number of conductors in any conduit exceed that laid down in Tables of the I.E.T. Regulations.

Where conduits are concealed in the plasterwork or walls or ceilings, all conduit and accessory boxes shall be installed with the outer edge of the box finishing flush with the plaster finish.

At luminaire positions, where conduits are concealed in roof and ceiling voids, conduit boxes shall be arranged surface on the underside of the floor slab above directly over the luminaire location.

The whole of the conduit system (or portion thereof) shall be completed prior to the "drawing in" of cables, and all conduits shall be free from dampness and moisture. The building shall be reasonable dry and watertight before commencement of work.

The Electrical Contractor shall protect the surface of all conduits fitted, from rust and damage throughout the construction period. Conduits installed for later covering with plaster, concrete, cement, screed etc., and in positions which will render the conduit permanently concealed or inaccessible shall have all bare and scratched metal work painted with a liberal coat of red oxide or aluminium paint immediately on completion of that section of the installation. Any evidence of rust on conduit particularly on threads shall be removed prior to installation. All conduits on site shall be stored in such a way that they are not subject to maltreatment moisture of condensation.

All unused entries on conduit and accessory boxes etc. must be blanked off by means of brass plugs or equivalent to suit location, firmly secured to provide complete enclosure of wiring.

All conduit boxes for accessories, i.e., switches, switch socket outlets, etc., shall be of rust resistant finish both internally and externally and these shall be fixed square in all locations by means of two wood screws into plugs one at each corner or as appropriate depending on nature of building fabric.

All trunking and conduit systems shall be sized with a 25% expansion factor. Trunking and conduit sizing calculations shall be included within the Contractors design submission.

Where accessories and luminaires etc. are shown wall mounted these shall be secured to an appropriate back box or conduit box as required.

The boxes shall be recessed in the wall into recesses cut out by the Principal Contractor. Entry to the boxes shall be by conduit from behind.

4.5 PVC Conduit

The general method of installation within ceiling voids and down walls shall be high impact PVC conduit. PVC conduit shall be used as containment down walls to accessory positions.

PVC conduit and conduit accessories shall be manufactured in accordance with the relevant BSS.

All PVC conduits shall be high impact with solvent fixed joints and expansion couplings.

The minimum size of conduit shall be 20mm diameter.

Conduit fittings for the PVC conduit system shall be PVC. Conduit boxes shall be of the pattern having long screwed spout outlets except for back-outlet loop-in pattern which shall have plain clearance hole entries.

Adaptable boxes shall generally be of the same PVC pattern.

Saddles for surface mounted conduit shall be of the distance type.

Conduits shall be run on the surface of walls, ceilings, etc.; they shall be installed in a neat and workmanlike manner.

The conduit system shall be carefully planned and erected to avoid all unnecessary bends, sets or changes of direction. Conduits shall be laid in straight and symmetrical lines with easy machine-made sets or bends at angles. Where multiple runs of conduit change direction the radii of the bends or sets shall be laid out from a common centre and where draw-in points are required at right angle changes of direction of multiple runs, adaptable boxes shall be used. Not more than two right angle bends, or not more than four sets shall be installed between consecutive draw-in or inspection boxes. Where possible, adaptable boxes shall be positioned in Store Room and other situations where they are less conspicuous.

All bends must be made on site by means of bending springs; factory made bends will be permitted.

All conduits and accessories shall be installed with sufficient and adequate fixing in a slightly and workmanlike manner so as to comply with good general practice.

Conduits run on exposed surfaces and walls shall be securely fixed at intervals of not more than 1.2 metres horizontally by distance saddles to give a clearance of 5mm from the surface.

Vertical conduit runs shall have saddles fixed at distance of not more than 300mm from their point of emergence with floors or ceilings and further saddles shall be fixed consistent with the requirements of spacing and appearance. Saddles shall be fixed on each side of every bend at a distance of not more than 300mm form the points of intersection of the centre line of the conduits. Multiple saddles shall be used for parallel runs of two or more conduits. Conduit boxes shall be securely fixed independently of conduit fixings.

Conduit shall be installed to give a minimum clearance wherever possible of 150mm between gas, water, steam pipes, etc., and where this is not possible all service pipes including the conduit system shall be adequately bonded together in accordance with the I.E.T. Regulations. They shall not be run in the same duct or trench as gas pipes.

As far as possible provisions for effectual "draining off" of all conduits must be made so as to prevent the accumulation of moisture within them, whether derived from condensation or any other sources. Drainage holes or T boxes with short length spout outlets shall be used at the lowest part of the conduit system to allow ventilation of the wiring and drainage, exact location of drainage hole to be agreed on site with the Contract Administrator.

In positions where the appearance of the conduit run is likely to be improved by the introduction of dummy lengths of conduit and in all positions where a more secure fixing for the suspension of equipment, light fittings, etc., would be obtained by extending the conduits beyond their normal terminations, such dummy conduits and extension shall be provided.

Unless otherwise specified, conduit run to a bulkhead lighting point shall terminate at a standard circular conduit box and conduit run to a fluorescent lighting point shall terminate at two standard circular conduit boxes at the fixing centres of the fitting.

Conduits throughout shall be of sufficient diameter and so arranged with draw-in boxes to permit easy draw-in or removal of one or all cables. Under no circumstances shall the number of conductors in any conduit exceed that laid down in Tables of the I.E.T. Regulations.

All trunking and conduit systems shall be sized with a 25% expansion factor. Trunking and conduit sizing calculations shall be included within the Sub contractors design submission.

Where accessories and luminaires etc. are shown wall mounted these shall be secured to an appropriate back box or conduit box as required.

The boxes shall be recessed in the wall into recesses cut out by the Principal Contractor. Entry to the boxes shall be by conduit from behind.

4.6 Cable Basket

All cable basket containing both sub mains and final circuits wiring shall be installed within ceiling voids suspended on a system of screwed rod suspensions.

The basket system shall be complete with manufacturer’s jointing pieces and shall be terminated within 100mm of each dropper position.

The Contractor shall note separate basket systems shall be installed to accommodate both band one and band two circuits.

4.7 XLPE/SWA/LSF Cables

The Contractor shall note that all sub main distribution circuits and a number of fixed power supplies shall be carried out using XLPE/SWA/LSF armoured cables.

These cables shall be tied to a dedicated containment system of SRF galvanised steel tray
The XLPE/LSF/SWA/LSF cables shall be 600/1000 volts grade to the current British Standard and shall consist of high conductivity copper conductors covered with phase identification coloured XLPE insulation. Where possible shaped conductors are to be used to produce the most compact design. Where stranded cores are used, they shall be complete with PVC fillers between laid up cores. A single layer of galvanised steel wire shall be applied and bedded I extruded black LSF. The complete cable shall have an extruded black LSF oversheath, the external surface of which shall be embossed with the voltage designation.

All cables shall be delivered to site on cable drums with the manufacturer’s cables attached. These shall be handed to the Contractor.

No cable conductor shall be less than 1.5mm^2 area and no joints shall be allowed.

The cables shall be terminated at the equipment served by a mechanical type of cable gland. The glands shall be complete with armouring clamp/lug suitable for bonding the armouring to the unit served by means of copper cable equal to that of the phase conducts, and the bonds shall be installed at the time of making the termination.

Hangers shall be spaced according to the IET Regulations or to be manufacturer's recommendations as appropriate, for the cables to be supported and the Sub-Contractor shall take particular care to avoid sagging, or stress on any cable by wrongly positioning or inadequately spaced hangers.

Single and multi-way cleats shall be provided, and they shall be of pressure die cast in silicon aluminium alloy of the interlocking pattern, for mounting either on steel channels or directly to concrete structure in the case of single way cleats. The sizes of cleats shall be so selected such that all cleats can be tightened down without exerting undue pressure or strain on the cables. In the case of vertical cables, the cleats shall be so designed and of sufficient number to grip the cable firmly to prevent creeping.

No cable shall be run without fixings and all cable hangers, and racks shall be approved by the engineers before installation. Where cable routes are subject to numerous changes in level and direction, additional cable hangers shall be provided to satisfactorily negotiate all such obstructions.

Where cables are spaced some distance from a supporting surface the cable racks shall be separately bolted to additional lengths of channel section which in turn shall be fixed to brackets bolted and fixed into the structure, and shall be subject to approval of the ECS Consultants.

Identification discs shall be provided for cables installed within buildings and shall be attached with galvanised wire to each cable at intervals not greater than 7 meters and at all conspicuous positions, cable terminations and at every exit/entry point to an area. Discs shall be machine engraved from non-deteriorating black "Traffolyte" or similar material displaying white engraving indicating the design voltage, cable size numbers of cores and cable reference. The characters shall not be less than 4mm high and shall be clearly legible.

All work shall be carried out by the Sub-Contractor, who is to include for the supply and installation of all jointing materials, cable supports, steelwork racks and making all necessary cable joints. The cable shall be installed and tested in strict accordance with the appropriate clauses of the IET Regulations.

Where cables are installed externally, they shall be XLPE/SWA/PVC.

4.8 FP200/LSF Enhanced Fire Rated Cable

The Contractor shall note that all fire alarm detection and any other life safety system supplies, such as the refuge alarm installation shall be supplied and installed using FP200/LSF Enhanced Fire Rated Cable

The cable installation shall be installed on a dedicated system of SS light duty galvanised steel cable tray within the ceiling voids where practicable or where agreed clipped direct to the building fabric using metallic fire resistive supports.

Manufacturer's instructions regarding fixing distances for cable tray shall be adhered to, the cabling shall be supported by either the spacing of supports for cables or containment systems. Stainless steel cable ties shall be used to secure the cabling to the cable tray so as such that they will not be liable to premature collapse in the event of a fire. All excess cable ties shall be cut off – A stainless steel cable tie spacing of 300mm shall be employed throughout the installation.

All cable terminations shall incorporate red PVC stuffing glands or brass glands as identified for enhanced cables and fire resistive enclosures.
Cables shall terminate into metallic fire resistive boxes.

Where metallic fire resistive supports (P Clips) are utilised, these shall be selected and erected in accordance with the manufacturer's guidelines and finished in red.

The Contractor shall ensure all cables are installed in a neat and workmanlike manner, installed as per the manufacturer's guidelines regarding maximum bending radius, cable support, methods of installation and segregation of services.

This surface mounted cable shall be enclosed within a system of PVC mini trunking. The cable shall be clipped within the mini trunking via fire resistive supports clipped direct to the building fabric at a distance of 300mm in line with the manufacturer's installation guidelines.

4.9 Cat 6 Data Cabling

The Contractor shall note that where data systems are to be replaced shall be supplied and installed in Cat 6 cables.

No cable run shall be longer than 90m. Where necessary the building shall be provided with more than one wiring centre, suitably located, and connected by a fibre optic cable to another wiring centre. The Contractor shall note that any Cat 6 cable run exceeding 90m in length will fail the standards test and will not be accepted.

Wiring runs shall be installed on MRF medium duty galvanised steel cable tray within equipment rooms, risers, and ceiling voids. Underfloor spaces, where outlets are to be in floor boxes, galvanised sheet tray may be used instead of cable tray to facilitate fitting flexible conduit. Where wiring runs are not in such spaces, they shall be enclosed in plastic trunking on the surface of a wall. In some locations, mini trunking may require painting to be discreet and/or to avoid reflections.

Dado trunking, back boxes, floor boxes and containment shall be of sufficient depth to accommodate the bending radius of Category 6 cable.

All Cat 6 cabling shall be made with approved products, terminated in data cabinets, and certified to comply with the relevant standards.

Cable bundles shall be secured with cable ties to prevent any possibility of crushing or deforming the cable.

When installing cable in containment or conduit the Contractor shall allow for 25% future expansion. However, this requirement may be relaxed in the case of flexible conduit attached to individual floor boxes, if by prior agreement with the Contract Administrator and ECS Consultants.

Where floor boxes and containment are set permanently into the floor an allowance for at least 100% expansion shall be made.

All data cabling shall be one continuous unjointed length from patch panel to outlet and shall not have splices or in-line connectors other than those integral to the patch panel and the room outlet. No "consolidation points" shall be used.

4.10 Flexible Cords

Flexible cords shall comply with the requirements of British Safety Standards and shall not be less than 0.75mm^2 PVC insulated. When the flexible cord supports a luminaire, then the supported weight shall be in accordance with the appropriate table in the I.E.T. Regulations. Where necessary, a supporting strainer wire of chain shall be used.

Flexible cords shall be suitable for the highest operating temperature likely to occur in normal service.

Flexible cords to fixed apparatus shall be made in such a way as to ensure that the length of cord used shall be kept to a minimum length.

4.11 PVC Mini-Trunking

PVC mini trunking shall be installed using manufacturer's jointing pieces.

All PVC mini trunking shall be continuous to the end of walls.

PVC mini trunking shall be installed in a neat and inconspicuous manner.

PVC mini-trunking routes shall be selected with the Contract Administrator.

Where fire alarm and detection equipment are installed, wall mounted this shall be installed via RED ALERT or RED YT2 trunking systems.

4.12 PVC Cable Trunking

Plastic trunking shall be rigid PVC heavy gauge, white, high impact complete with lid, full length back tray and manufactured fittings.

Plastic trunking shall be installed in accordance with manufacturer's recommendations.

Plastic trunkings shall be secured rigidly to building fabrics using round headed steel wood screws in manufactured plugs with oversize washers to prevent screw heads pulling through holes in trunking.

All plastic trunkings shall incorporate protective conductors.

All changes in direction of plastic trunking shall be carried out via purpose made accessories.

Plastic trunking shall be cut to length and access holes for conduit entry etc. shall be cut using only the manufacturer's special tools.

Surface fixed plastic trunking shall be routed as unobtrusively as possible following the architectural features of the room even if this entails longer runs of trunking. Trunking shall be run along full wall lengths and must not terminate part way along a wall, unless specified to the contrary.

Plastic trunking shall not be routed through areas suffering high or low temperatures.

Where dado trunking is being installed to serve office environments with Cat 6 data cables, the trunking shall incorporate steel screening divider to BS EN 50174-2, 50mm power/data separation to BS EN 50174-2, full compartment copper spray screening with NO reduction of compartment capacity, adjustable depth data boxes and Cat 6 data outlets.

4.13 Fire Stopping

Where wiring systems or systems of containment pass through a wall, floor, ceiling, partition or fire barrier, the hole and area surrounding the installed item should be made good in accordance with Regulation 527.2.1. The hole should be made good with material that provides an equal or greater fire barrier to that of the surrounding material.

4.14 Cables in Trenches

The external lighting cables shall be laid in a cable trench at a depth of 450mm on a sand bed in grass areas and 600mm in hard standing. Sand shall be laid 50mm above the cable.

The Contractor shall then lay a PVC identification tape coloured yellow complete with black lettering "Danger Electricity".

The soil shall then be laid on the tape and compacted to 100mm below ground level. A second layer of PVC identification tape shall then be laid, and the ground made good.

The Contractor shall note that all trench works shall be carried out by the Principal Contractor.

4.15 Secondary Support Steelwork

A system of secondary steelwork is to be provided by the Contractor to facilitate the support of all electrical services.

The system shall comprise of Unistrut steel sections fixed to the primary steelwork.

Emanating from this shall be screwed rod suspensions to fixing brackets to trunking and traywork systems.

The Contractor shall note that prior to the installation of the steelwork support system, the Contractor shall produce a working drawing detailing plan views of the steelwork on the general arrangement drawing.

In addition, working sectional drawings detailing sizes of steelwork and fixing arrangements shall also be produced by the Contractor for comment.

All steelwork support drawings shall be issued to the structural engineer for comment.

The Contractor shall include to revise the drawings as appropriate to obtain the structural engineer's approval.

4.16 Final Positions

The location of all items of equipment shown on drawings is that envisaged at the time of tender.

Prior to setting out the position of any item of electrical and control equipment provided through the electrical and integration contracts, the Contractor shall obtain confirmation in writing from the Principal Contractor that the details he is working to are correct and current and where confirmation is to be sought shall obtain same prior to installation.

Any claim for lack of information due to incorrect setting out or any other reason whatsoever will not be considered.

The Contractor shall note that the position of equipment on the tender drawings is for tender purposes only. The final location of all accessories shall be determined by a site walk around with the Project Architect and Client.

The Contractor shall include to revise the drawings to meet with the revised layout. The Contractor shall note that any deviations from the tender drawings up to 2000mm either side of the accessory position shall be carried out at the Contractor's own expense.

4.17 Mounting Heights

Unless specified otherwise in this Particular Specification or on the associated drawings the following mounting heights above finished floor level and measured to the underside of the accessory box shall be used:

Lighting switches (top of switch)	1200mm
Low Level socket outlets spur units T.V. outlets etc. (bottom of socket)	450mm
Over-bench mounted switched socket outlets etc.	150mm above top of bench
Isolating switches and switch fuses	1200mm
Bells and sounders	Generally 2100mm to the centre line of the bells
Manual Call Points	1200mm

High level socket outlets, TV outlets etc	1800mm
Thermostats	1700mm to the centre line of the stat unless otherwise stated
Wall lights	Generally 2000mm to the centre line of the fitting.
Low Level Lights	450mm
Cooker control	Generally 1200mm to lower edge of unit and to the side of the cooker.
External Sockets	600mm above ground level.
Dado Trunking Systems	900mm to the underside of the trunking, or Agreed as the fitted furniture layout, directly on top of fitted furniture desktops.

The Contractor shall note that the final locations of all accessories and final mounting heights shall be agreed on a site walk around with the Architect, Contract Administrator, Principal Contractor, and Client.

Inclusion shall be made to ensure all accessories, trunking, traywork, basket, dado trunking are co-ordinated with mechanical services. Inclusion shall be made to ensure a 150mm gap between the top of radiators and dado trunking systems.

5. INCOMING TELECOMMUNICATIONS

The Contractor shall note that no internal works to the existing Heaton Hall incoming telecommunication system, cable and internal phone network cables are part of this project however the contractor should include for a quotation to supply and install a new Redcare device to an Advanced Extra IP/GPRS

The Contractor shall note that the proposed emergency line system shall be a VOIP system backed via a dual sim GPRS, this shall cover.

- Emergency lines for life safety systems
- Emergency lines for security systems.

The Contractor shall include to carry out all on site liaison and co-ordination with the telecom operator to facilitate the changeover to the new device.

6. INCOMING ELECTRICAL SERVICE

Existing Incoming Service

The building has 2No aged HV transformers and associated switchgear located in the switch-room in the basement of the west wing, the ownership of the equipment (Transformers) was originally thought to belong to Electricity North West. However, after further investigations by ECS with Electricity Northwest it has been ascertained that the transformer and HV switchgear are privately owned.

From the transformer there are several meters which supply the Main Hall, as well as other buildings and power supplies in Heaton Park. The switch room is in poor condition and is damp, this has had a detrimental effect on the metering equipment which is in poor condition and corroding.

The Contractor shall note the incoming electrical supply comprises of a 100KVA, 515/3.3KV transformer feeding and existing 300A TP&N switch fused at 315Amp although this may serve other buildings on the site The electrical supply to the hall is based on 60kva 100amp supply.

6.1 Pre-Commencement Survey & Electrical Testing of Incoming Electrical Mians including Disconnection and Removal from Site

The contractor shall note that a PC Sum of £10,000.00 has been included within the priced section of this specification for the contractor to carry out the following works to the main electrical incoming supply and switch room.

a) Commission and supervise Manchester City Council (MCC) HV specialist electrical contractor to test and inspect the existing 2No transformers located within the west wing basement electrical switch room to ascertain if the transformers are still live and where they are supplied from and the characteristics of the supply.

b) HV specialist contractor to include for all disconnections and dismantling of the transformers from the basement and site if the transformers are not live or in operation.

c) HV Specialist to carry out a test and inspection including CAT scan and ascertain where Heaton Hall is currently supplied from and confirming which of the switch fuses are serving the bus bar chamber in the basement and the characteristics of the supply. The current thinking is that the supply for the house forms part of the electrical system in the Stables Block



d) Electrical Contractor shall test and isolate the existing electrical switch fuses within the switch room and confirm if any other external buildings are fed from the switch room – for example the Heaton Park Temple building is fed from the Hall (this has been confirmed by the Parks Division) It is also likely that the Pitch and Putt Café may also be fed from the Hall switch room also Contractor shall note where these buildings are supplied from and the characteristics of the supply

PC Sum - Modifications to main incoming supply to the basement electrical layout and removal of redundant privately owned transformers **- £10,000.00**

The contractor shall include to liaise with Electricity Northwest to ascertain the existing tariff and rating of incoming fuse links

The Contractor shall include to undertake all works necessary with the Local Supply Authority (Electricity Northwest) in respect to the administration to confirm any reconnection dates, site liaison and connection to enable the provision of incoming electrical supplies. The Contractor shall note that the Client has applied for the reconnection electricity service for the buildings. All REC costs shall be met by the Client.

The Contractor shall include to check the various application contents of the application, produce layout drawings, determine on site with the REC Site engineer details of incoming routes, section board elevations

and containment systems, ducts, trenches, etc. and all works associated, necessary for the supply to be connected.

ECS Consultants has made the initial contact with Electricity Northwest.

The Contractor shall include to review the electrical reconnection supply quotation and be fully aware of the project specification requirements and associated works required by the Contractor to enable the completion of the installation.

Energy Provider

The Contractor shall also expedite all work necessary in respect of the liaison with the clients preferred energy provider for both the Heaton Hall electrical metering requirements and a sub meter serving the private catering contractor at the Orangery building .

Where the client does not have an energy representative (Group Buyer) the Contractor shall carry out all works associated to provide details of the most financially advantageous energy provider and annual meter maintenance charges these shall be submitted to the Principal Contractor and client for formal acceptance prior to any orders being placed.

The Contractor shall include to complete all paperwork on behalf of the client with the clients approved energy provider to enable the contractor to submit application forms for the provision of the electricity meters.

Electricity Meters

The Contractor shall include to provide details of the most financially advantageous electricity meter installation and annual meter maintenance/rental charges these shall be submitted to the Principal Contractor and client for formal acceptance prior to orders being placed.

The Contractor shall liaise with all parties associated with the provision of the supply. The contractor is responsible for all site organisational and coordination activities required to enable the provision and connection of the electricity supply and associated energy meters in line with the Principal Contractor's programme.

All utility costs for the electricity application shall be met by the Principal Contractor.

The Contractor shall include to liaise with both the energy provider and the electricity meter provider to establish the meter installation dates in line with the Principal Contractor's programme.

The Contractor shall ensure where new utility energy meters are to be installed these shall be supplied by the energy provider as previously detailed with an energy meter reading of zero.

The Contractor shall include to supply and install electricity pulse meters integral within each distribution board these shall be installed within the same enclosure of the distribution board it serves and shall be in conjunction to the main electricity meter via the energy provider.

The Contractor shall include to supply and install an appropriately sized fire rated back board for the meter position as detailed in the REC utility quotation project specification. The requirements shall be provided to the Principal Contractor to enable the setting out and construction of the metering service enclosure.

The Principal Contractor shall include for the payment of all electricity used during the construction, testing and commissioning of the systems up to the point of practical completion and handover of each building/apartment.

Prior to the issue of MPAN numbers, ENWL will require the full postal address, including postcode for the property to be connected, together with confirmation of the end users nominated electricity provider. The Contractor shall include to obtain all relevant information on behalf of the client to ensure MPAN are issued prior to any premises being occupied.

Disconnection of Existing Service

The Contractor shall include to undertake all works necessary with the Local Supply Authority in respect to the administration to confirm disconnection dates, site liaison and associated builders works to enable the disconnection of the existing electrical supply.

The disconnection of the existing service shall be fully coordinated with the connection of the new incoming service to ensure the site supplies are maintained throughout the project the connection/disconnection dates shall be carried out in line with the Principal Contractor's construction programme.

Following the disconnection of the existing supply the contractor shall include to remove the existing supply cable and main distribution installation and associated cable installations.

The contractor shall arrange to undertake all liaisons necessary with the existing utility meter provider to attend site and disconnect, remove, and dispose the redundant existing utility meter.

7. MAIN SWITCHGEAR AND SUB-DISTRIBUTION

The Contractor shall, supply and install a complete distribution system as detailed on the associated ECS tender layout drawings.

The general switchgear and sub distribution systems shall comprise of an MCCB panel board and various MCB/RCBO distribution boards. The main isolator and MCCB distribution panel boards shall be manufactured by Schneider and form part of their Panel Board Range.

The main section board SEC01 located in Basement West Wing Area comprising of:

a) Existing 100KVA 300Amp TP&N Incoming Supply

b) 12-way TP&N 630A MCCB Distribution panel manufactured to BS EN 61439-2 Low-voltage switchgear and control gear assemblies, complete with lockable doors, blanking pieces, incoming terminal lug connection and 630A AMP copper busbars. The three-phase MCCB's shall be selected from the manufacturer's range of circuit breakers adjusted to trip at the current rating indicated on the drawing, fed from (a) with label –"Main Section Distribution Board", Ref: SEC01. The main isolator and MCCB distribution panel boards shall be manufactured by Schneider and form part of their Panel board Range.

c) Type 1 & 2 surge protection device from TP&N way in 'LVP01' fused at 63A and supplied via 3m of 6491B 16mm^2 LSF singles cables in trunking.

The Contractor shall supply and install rubber mat at the main switchgear and panel board location.

The Contractor shall also provide a CO_2 fire extinguisher within the main switchroom.

The Contractor shall include for providing and installing a mounted and framed diagram providing details of electric shock treatment within the switch room.

The Contractor shall include to label all switchgear. These labels shall be issued in draft format to the Contract Administrator for approval prior to manufacture.

Appropriate 'DANGER' labelling shall be included on all distribution equipment.

Labels detailing general information shall be black letters 5mm high on a white background. All labels shall be fixed using pan head self-tapping screws.

The Contractor shall include for providing and installing a mounted and framed A1 sized diagram in the main intake cubicle indicating the general arrangement of the electrical circuits and indicating the value of prospective short circuit PSC and earth fault load impedance Zs at each distribution board.

The existing title block on this diagram and all As Fitted Drawings shall remain. The sub contractor's logo and address shall also be inserted.

The Contractor is to note that the PSC and Zs tests shall be witnessed by the Contract Administrator.

All labels on distribution boards shall be complete with measured values of PSC and Zs.

The Contractor shall include for the provision of typed circuit charts in each of the distribution boards as called for in the standard specification including circuit breakers shall be labelled to match the charts.

The contractor shall include to supply and install new unistrut structure layout complete with hour fire rated plywood fixed to the existing wall to mount all the electrical distribution boards in the basement electrical mains room.

8. SUB DISTRIBUTION SYSTEM

The sub-distribution shall comprise of various three-phase and single-phase distribution boards, and various mechanical supplies and controls supplied via SEC01.

The sub-distribution system shall be complete with lockable MCB/RCBO distribution boards as indicated on the appropriate drawings.

All MCB's and RCBO's AFFD shall be rated at M9 or above and shall be manufactured to comply with BSEN 60947-2 having type B time/current characteristics for power and lighting and type D for all sub-main supplies.

The distribution boards shall be finished in metal clad, complete with hinged covers and key operated locks. Each distribution board shall have 25% spare capacity.

The distribution board spare ways shall be filled using equal numbers of 32A, 20A, 16A, 10A and 6A MCBs and 6A and 32A rated RCBO's. The 32amp will also incorporate AFDD protection

8.1 Metering Requirements

Metering shall be included in section boards, fitted to the downstream side of the incoming device. Final distribution boards shall be arranged to provide separate metered supplies to lighting and small power. Meters shall be revenue standard and be capable of providing the following data:

- kW (snapshot and historic - max/min/average)
- kWh to date
- pf (Power Factor)
- Voltage
- Hz (Hertz)
- Harmonics

Meters shall be capable of being networked and accessed remotely. Network cabling and data connection points shall be provided to make connection to the existing server.

The following schedule details the size and type of all distribution boards and control panels.

LP01 – West Wing Basement Electrical Switch Room

a) 8Way TP&N Type B Distribution Board c/w 125A main switch and ivorine label, Ref: LP 01 c/w pulsed output metering equipment.

b) Type 1 and 2 surge protection devices supplied from a 63A TP&N MCB from LP 01/08 via 6491B 16mm singles cables installed on general power side.

LP02 – East Wing Basement Staircase Area

a) 12Way TP&N Type B Distribution Board c/w 125A main switch and ivorine label, Ref: LP02 c/w pulsed output metering equipment

b) Type 1 and 2 surge protection devices supplied from a 63A TP&N MCB from LP 02/12 via 6491B 16mm singles cables installed on general power side.

LP03 – Ground Floor Central Area – Main Office

a) 8Way TP&N Type B Distribution Board c/w 125A main switch and ivorine label, Ref: LP03 c/w pulsed output metering equipment

b) Type 1 and 2 surge protection devices supplied from a 63A TP&N MCB from LP 03/08 via 6491B 16mm singles cables installed on general power side.

.

LP04 – Orangery Area

a) 12W TP&N Type B Distribution Board c/w 250A main switch and ivorine label, Ref: LP 04 c/w pulsed output metering equipment

b) Type 1 and 2 surge protection devices supplied from a 63A TP&N MCB from LP 04/08 via 6491B 16mm singles cables installed on general power side.

LP05 – Central Area First Floor – Main Staircase Store

a) 8Way TP&N Type B Distribution Board c/w 125A main switch and ivorine label, Ref: LP05 c/w pulsed output metering equipment

b) Type 1 and 2 surge protection devices supplied from a 63A TP&N MCB from LP 05/08 via 6491B 16mm singles cables installed on general power side

LP01/1/L2 – West Wing Ground Floor Corridor Area

a) 12W SP&N Type B Distribution Board c/w 63A main switch and ivorine label, Ref: LP01/1/L2 c/w pulsed output metering equipment

b) Type 1 and 2 surge protection devices supplied from a 63A SP&N MCB from LP 01/1/L2/12 via 6491B 16mm singles cables installed on general power side.

LP01/1/L3 West Wing First Floor Corridor Area

a) 12W SP&N Type B Distribution Board c/w 63A main switch and ivorine label, Ref: LP01/1/L3 c/w pulsed output metering equipment

b) Type 1 and 2 surge protection devices supplied from a 63A SP&N MCB from LP 01/1/L3/12 via 6491B 16mm singles cables installed on general power side.

LP01/2/L2 West Wing Bakery Building Ground Floor

c) 12W SP&N Type B Distribution Board c/w 63A main switch and ivorine label, Ref: LP01/1/L3 c/w pulsed output metering equipment

Type 1 and 2 surge protection devices supplied from a 63A SP&N MCB from LP 01/1/L3/12 via 6491B 16mm singles cables installed on general power side

LP02/4/RYB- East Wing First Floor Corridor Area

a) 8W TP&N Type B Distribution Board c/w 125A main switch and ivorine label, Ref: LP02/4/RYB c/w pulsed output metering equipment

b) Type 1 and 2 surge protection devices supplied from a 125A SP&N MCB from LP 02/4//08 via 6491B 16mm singles cables installed on general power side.

LSI/1 – Static Inverter East Wing Ground Floor Staircase – Emergency Lighting for Decorative Luminaires and Chandeliers

a) Kohler Power EL100XA 3KVA static Inverter complete with 3hours battery at 2,5KVA load complete with 8No integral outgoing 6 Amp MCBs. Referenced LSI/1

LSI/2 – Static Inverter East Wing Ground Floor Staircase – Emergency Lighting for Decorative Luminaires and Chandeliers

a) Kohler Power EL100XA 3KVA static Inverter complete with 3hours battery at 2,5KVA load complete with 8No integral outgoing 6 Amp MCBs. - Referenced LSI/2

Boiler House Plant Room Controls

Existing Heating and Mechanical Plant Control Panel (Ref. H+V1) supplied from Section Board Ref: SEC 01.

Existing Local Supplies to Other Adjacent Buildings

The contractor shall include to reconnect the existing supplies serving the Heaton Park Temple Building and Pitch and Putt Café into the SEC01 panel board as highlighted on the tender schematic drawing

8.2 General

The mains isolation and MCB/RCBO distribution boards shall be manufactured by Schneider or Eaton and which part of their Memshield range or equal and approved.

The Contractor shall note that where the switchgear is to be mounted against metal steel walls and as such the Unistrut frame shall be self-supporting complete with leg and raw bolted to the floor.

Two weeks prior to the installation of the main switchgear, the Contractor shall submit for approval by the contract administrator on A4 sized sketched main switchgear layout drawing.

This shall detail the location and orientation of all switchgear and the sizes of all interconnecting cabling.

Following approval of the drawing, the installation shall be finalised, and all parties informed.

All main switchgear is to be fixed directly to masonry walls.

All distribution boards shall be supplied using XLPE/SWA/LSF cable tied to a dedicated cable containment system as previously described. The containment system shall be supported by Unistrut and screwed rod or fixed via Unistrut bracket direct to masonry walls.

All distribution, panel boards and control panels shall be supplied complete with spreader boxes where required.

All sub-main cables shall be complete with all appropriate cleats, ID labels and earth tag terminations.

The Contractor shall note that all sub-main cables shall be segregated from mechanical services by a distance not less than 150mm.

The distribution boards shall be complete with labels and circuit charts, as detailed within a separate section of the specification. Generally, all distribution boards shall be mounted 1200mm AFFL and complete with locking lids.

Labels, which indicate danger, shall be engraved red on white as same.

Labels detailing general information shall be black letters 5mm high on a white background. All labels shall be fixed using pan head self-tapping screws.

All MCB's shall be rated at M9 or above and shall be manufactured to comply with BSEN 60947-2 having type B time/current characteristics for general lighting and power and type D for all sub-main supplies.

The Contractor shall include for providing and installing a mounted and framed A1 sized diagram in the main intake cubicle indicating the general arrangement of the electrical circuits and indicating the value of prospective short circuit PSC and earth fault load impedance ZS at each distribution board. The existing title block on this diagram and all As Fitted Drawings shall remain. The Subcontractor's logo and address shall also be inserted.

The Contractor shall include the provision of £250 (Two Hundred and Fifty Pounds) to obtain the services of: -

ECS Consultants Limited
148 Stockport Road
Cheadle
Cheshire
SK8 2DP Tel: 0161 821 4677

or a similar specialist, to produce the A1 sized distribution diagram.

The Contractor is to note that the short circuit tests and earth loop impedance tests shall be witnessed by the contract administrator.

A drawing indicating the proposed diagram shall be submitted to the contract administrator for approval before installation.

The Contractor shall include for the provision of typed circuit charts in each of the distribution boards as called for in the standard specification and breakers shall be labelled to match the charts.

The Contractor shall include for providing and installation a mounted and framed diagram providing details of electric shock treatment within the switch room.

Before any main electrical circuit is disconnected the Contractor shall advise the contract administrator.

All labels on distribution boards shall be complete with measured values of PSC and ZS.

The Contractor shall include to construct a suitable Unistrut frame to mount all switchgear. Inclusions shall be made to dismantle and re-assemble the existing switchgear cupboard.

9. SURGE SUPPRESSION

The Contractor shall include to design, supply, and install type 1 and 2 surge suppression devices (SPD's) adjacent to the main section board, '**SEC01'** and any distribution board serving external plant.

These shall be supplied from a three-phase way closest to the main switch on each panel / distribution board using 16mm^2 6491B cables in conduit or trunking from a TP&N 63A protective device.

The Contractor shall supply and install type 3 surge suppression devices to all distribution equipment directly serving IT server infrastructure.

The units shall be wall mounted within suitable enclosures installed adjacent to the switchgear.

The Contractor shall supply and install Schneider devices or similar, equal, and approved to each panel / distribution board as indicated elsewhere.

10. ARC FAULT DETECTION DEVICES (AFDD)

The Client has carried out a risk assessment which has resulted that Heaton Hall Grade 1 Listed Building should be afforded and require the installation of Arc Fault Detection Devices (AFDD's) and shall conform be installed to satisfy BS 7671: 18th Edition Amendment 1 and BS EN 62606 to provide additional protection against fire caused by Arc Faults in AC Final Circuits.

The Contractor shall include to design, supply, and install new AFDD devices to cover all small power sockets outlet circuits not exceeding 32amp, the device can either be a standalone device or integrated and combined with RCBO depending on the manufacturer's distribution boards.

The new AFDD devices as previously stated will have been selected to remove and mitigate the effects of any arching faults by disconnecting the circuit when an arc fault is detected further protecting the risk of fire on this Grade One listed building.

The Contractor shall supply and install Schneider devices or similar, equal, and approved to each panel / distribution board as indicated elsewhere.

The client/end user shall be notified of the requirement to test the AFDD's every six months.

11. GENERAL LIGHTING INSTALLATION AND CONTROLS

Background

Heaton Park Hall benefits from a number of ornate and historic luminaires. These vary from ceiling hung chandeliers to uplighters incorporated into the wrought iron steel balustrades forming part of the grand staircase.

It is proposed as part of these works, the luminaires are to be removed from site or repaired on site in a secure workshop area, rewired, and refurbished by a specified historic lighting specialist who shall take down, remove from site rewire and restore the luminaires and re lamp with LED to a colour temp, 2700K predominantly across our ranges of decorative lighting.

Other areas such as the fire damaged West Wing and Basement will have IP65 LED bullhead lighting installed with both integral presence detection and 3hr emergency lighting facility in certain locations refer to appropriate tender drawings.

General

The Contractor shall include to supply, install, test and commission a complete lighting installation including all associated control and detection devices a detailed on the appropriate drawings.

Existing Refurbishment of Chandeliers

The contractor shall note that MCC have requested Brotheridge Chandeliers or Chelsom Lighting to carry out the refurbishment of the existing heritage chandeliers (basically to be rewired internally and electrified at the arms.) who shall be generally responsible for the removal, refurbishment and reinstatement of all the major heritage chandeliers which will be secured and worked on in a secure location within Heaton Hall)

Historic Decorative Lighting Refurbishment of Existing Chandeliers

Brotheridge Chandeliers
3 Maytree Walk Contact: Terence Brotheridge

Skelmersdale,	Email:	terencebrotheridge@gmail.com
Lancashire	Telephone:	01695 555007
WN8 6UP	Reference	Heaton Hall Rewire

Historic Decorative Lighting and Refurbishment of Existing

Chelsom Lighting		
Heritage House,		
Clifton Road,	Contact:	Robert Chelsom
Blackpool,	Email:	Robert_Chelsom@chelsom.co.uk
Lancashire,	Telephone:	01253 831421
United Kingdom,	Reference	Heaton Hall
FY4 4QA		

This process will be carried out on site in a secured workshop room with opportunity for interested parties to view the process. and developed as a workshop area to allow interested external bodies to view the history and refurbishment of the chandeliers when requested by the Contract Administrator (include for four Saturdays

Generally, this includes for

- Dismantle chandelier.
- Remove frame, replace chain, tie in flex.
- Replace thirty-three icicles plus 66 Regency top double point buttons.
- Changing head pins on chains of crystals, pendants & dressings.
- Taking out old wiring from the ceiling, removing flex and lamp holders.
- Rewiring arms in double insulated flex.
- Rewiring from the connector at the top of the chandelier through the stem and making connections in the base.
- Supply, SES lamp holders, flex, connectors, brass tubing, and candle tubes.
- Cleaning.
- Reassembling

New Installation

The Contractor shall note that the luminaires shall be manufactured and supplied through a number of specialist lighting manufacturers.

Historic Decorative Lighting and Refurbishment of Existing

Chelsom Lighting		
Heritage House,		
Clifton Road,	Contact:	Robert Chelsom
Blackpool,	Email:	Robert_Chelsom@chelsom.co.uk
Lancashire,	Telephone:	01253 831421
United Kingdom,	Reference	Heaton Hall
FY4 4QA		

Standard Lighting to Basement. West Wing, East Wing Servants area and External Floodlighting

Dextra Lighting Ltd		
Brickfields Business Park	Contact:	Nick Southern
Gillingham	Email:	nsouthern@dextragroup.co.uk
Dorset	Telephone:	07715697132
SP8 4PX	Reference:	Heaton Hall

The Contractor shall note the luminaire schedule is appended to this specification.

The Contractor shall note that the colour finishes of all luminaires shall be agreed with the Contract Administrator prior to ordering. No claims shall be entertained if incorrect / non-approved luminaires are installed on site.

The lighting design shall be designed in accordance with the CIBSE code for interior lighting. All luminaires shall have LED lamp sources, with a minimum 50,000-hour life and a light output reduction of not less than 10% following 35,000 uses. The luminaires shall be supplied with a 5-year product warranty.

The Contractor shall provide samples of all luminaires to the Contact Administrator for comment.

The lamp type shall be generally 2700-4000K with the correct colour temperature for the areas served. This shall be in line with the CIBSE Interior Lighting Code, CIBSE lighting in Historic Buildings and English Heritage recommendations.

The luminaire selection shall complement the ceiling finishes schedule. The Contractor shall include to obtain a copy of this schedule during tender stage. No claims shall be entertained for lack of knowledge in relation to seeing sight of this schedule at tender stage.

The general method of installation shall be as previously detailed.

Final connection arrangements to all mains voltage luminaires shall be via a conduit box and plug in ceiling rose fixed to the underside of the ceiling within the void or via lighting control marshalling boxes, plug connectors and flexible cords.

This arrangement shall be complete with a surface PVC conduit box. The cables shall terminate into this box through PVC stuffing glands. Plug in ceiling roses shall then be fixed to this arrangement. Alternatively, lighting marshalling boxes shall be fitted.

In some situations, the plug-in ceiling rose shall be complete with a cover for the plug. Emanating from the plug shall be a 3 core HR flexible cable ref. 3039Y to the luminaire.

Where flexible cables emanate from either lighting marshalling boxes or plug in ceiling roses the flexible cables shall be on cable basket to luminaire positions.

11.1 Surface Luminaires

Where surface luminaires are to be used, they are to be fixed to support timber with wood screws. Cables will be directly fed into the back of the fitting through a protective grommet to ensure the cables are not scuffed or cut into by the metal casing of the fitting.

11.2 Recessed Downlights

Where recessed LED downlight luminaires are specified, they shall be fixed to the centre of the ceiling tile. The Contractor shall include to supply and install a 600 x 600 x 10mm sheet of plywood to be placed above the appropriate ceiling tile.

Luminaires fixed to the ceiling and back-board arrangement shall be fixed using appropriately sized wood screws.

11.3 Surface Luminaires – Areas without Grid Ceilings

Where surface mounted bulkhead luminaires are proposed in areas without grid ceiling, they shall be fixed directly to the wall or ceiling in the proposed position. Final connection shall be via surface mounted conduit box and plug-in ceiling rose fixed adjacent to the luminaire.

Luminaires fixed to the ceiling tile and back-board arrangement shall be fixed using appropriately sized wood screws.

11.4 Wall mounted Luminaires

The Contractor shall include to supply and install wall mounted luminaires within the stairwell area. These luminaires shall be mounted 2500mm AFFL.

The Contractor shall include at tender stage to obtain all necessary manufacturer's instructions associated with the practical difficulties of the installation of all specified luminaires. No claims shall be entertained relating to lack of knowledge relating to luminaires and their installation.

11.5 Surface Suspended Luminaires

The Contractor shall note that within the building various chandeliers and pendants LED surface luminaires shall be supplied and installed.

The Contractor shall install these luminaires from screwed rod suspensions fixed via the timber purlins from the underside of the roof slab. Final connection shall be via 3 or 4 pin plugs and sockets. These luminaires shall be mounted 4500mm AFFL.

The general method of installation within this area shall be 1.5mm^2 and 2.5mm^2 6491B stranded singles enclosed within a suitably sized galvanised steel trunking and galvanised steel conduit system. The circuit protective conductor size for the complete lighting installation shall be 1.0mm^2.

11.6 Existing Luminaires

The Contractor shall note that Heaton Hall would prefer to reuse a number of the decorative wall luminaires that have a historic significance. These shall be refurbished to take LED lamps, to operate in conjunction with appropriate simple lighting controls and linked into the static inverter to allow emergency lighting to function in the building.

The existing refurbishment of the heritage chandeliers will be carried out by Brotheridge Lighting Specialist as highlighted above with the process being carried out on site in a secured workshop room with opportunity for interested parties to view the process when requested by the Contract Administrator (include for four Saturdays

Generally, this includes for

- Dismantle chandelier.
- Remove frame, replace chain, tie in flex.
- Replace thirty-three icicles plus 66 Regency top double point buttons.
- Changing head pins on chains of crystals, pendants & dressings.
- Taking out old wiring from the ceiling, removing flex and lamp holders.
- Rewiring arms in double insulated flex.
- Rewiring from the connector at the top of the chandelier through the stem and making connections in the base.
- Supply, SES lamp holders, flex, connectors, brass tubing, and candle tubes.
- Cleaning.
- Reassembling

11.7 General

The Contractor shall include for the luminaire unpacking, checking and installation.

The Contractor shall include to install all luminaires complete with lamps.

Under no circumstances shall wiring be run through luminaires.

Inclusion shall be made to liaise with the Principal Contractor to ensure that all cabling is installed within the building frame and not exposed.

The Contractor shall include to liaise with the principal contractor to ensure the adequate luminaire supports are provided [particular for the historic chandeliers and decorative pendants.

Bulkhead type luminaires shall be fixed directly to the ceiling. Final connection shall be via a flush mounted conduit through box.

Under no circumstances shall wiring be run through luminaires.

The supply and fixing of all luminaires including the supply and installation of all cabling is to be carried out by the Electrical Contractor.

11.8 Switch Units

The Contractor shall supply and install various PIR and absence detection devices as detailed on the appropriate drawing. All lighting controls for new luminaires shall be supplied via Dextra Lighting Ltd.

Historic lighting to the main rooms in Heaton Hall is to be, controlled through the Kohler Static Inverter and finally through via 12 gang DP wall mounted switches located at the ground floor staircase to the basement and the first-floor storeroom near the Cupola Room which shall switch each room individually.

Stores area shall be provided with linear LED fittings or bulkheads either suspended or surface fixed, with integral presence sensor with at times emergency lighting facility l.

In other areas, such as the fire damaged west wing and basement the lighting control shall be through on/off switch or integral PIR presence controller.

The Contractor shall note that in WC's, the lighting shall be controlled via a 2-channel surface / recessed mounted presence detector (PIR). These shall be configured and commissioned for channel 1 to control the operation of the general lighting and channel 2 shall operate the existing extract fan, where applicable.

The Electrical Contractor shall include to purchase two handheld programming devices for all automatic detectors. The Contractor shall include to carry out all training with the Client's FM contractor on the setting of the luminaires.

The Contractor shall note that to meet the requirements of Approved Document Part L of the Buildings Regulations, all control systems must be commissioned in order to maximise energy savings.

The Contractor shall include for Chelsom Lighting and Dextra Lighting Ltd to test and commission the system and issue appropriate certification.

Lighting switches shall be a gridswitch type assembly comprising box, grid, 20 Amp rated switch with white rocker.

Switch cover plates shall be metal clad within general areas.

The switch units shall be manufactured by MK Electric and form part of their logic plus gridswitch range.

The final locations of all switch assemblies shall be agreed with the contract administrator and shall be in compliance with the requirements for approval document M and the requirements of DDA.

11.9 Luminaires and Lamps

The Contractor shall include for the supply and installation of luminaires as prescribed in the schedule and indicated on the drawings.

Lamps that are required for the historic lighting shall have a colour temp of 2700 and be either GLS or Candle shape.

Lamps supplied shall generally be Led Chip and Led tape on plates with a correlated colour temperature of 4000K or similar and approved.

The Contractor shall note that all luminaires shall be supplied complete with LED lamps.

12. EMERGENCY LIGHTING INSTALLATION

Background

General

It is noted that Heaton Hall currently does not have any existing emergency lighting, escape route lighting and signage installed in the building apart from a number of mobile photo luminescent (glow-in-the-dark) signage that are placed in key areas of the building when it is open to the public.

The project is proposing to provide emergency lighting both stand-alone and/or integrated with the general lighting system in the basement, fire damaged wing, corridors and staircases in the main house and will fully comply with BS 5266 Part 1 1999 (Code of Practice for Emergency Lighting of Premises), Health and Safety at Work Act 1974, Fire Precautions Ref. 1971 and The Building Regulations approved Document B and be arranged to operate for 3 hours duration upon mains failure.

In addition, exit signage will also be specified with emergency lighting luminaires also located to the basement, fire damaged wing and corridor areas that have no decorative ceilings.

Testing of the emergency lighting shall be carried out utilising key switches which are to be installed in the electrical cupboards adjacent to each distribution board. These are secret key switches engraved EM Lighting

Main Decorative Areas of the Hall

We are proposing to install two Kohler Power EL100XA, 3.5KVA static inverters and integral 8-way SP&N distribution boards complete with 6 AMP MCB's to supply all the decorative and historic chandeliers and luminaires which are being refurbished and reinstated. Static Inverters are virtually the same as a UPS system except they are configured to operate in 'active standby' mode with the bypass supplying the load during normal conditions. When a mains failure occurs, contactors are used to transfer to inverter with the standby batteries then supporting the load (typically for 3 hours depending on application).

Overview of New Works

The Contractor shall include to supply, install, test and commission a completely new emergency lighting installation to meet BS5266 Code of Practice for Emergency Lighting and CIBSE Guide requirements as detailed on the appropriate drawings.

The Contractor shall note that the emergency luminaires shall be manufactured and supplied through:

Dextra Lighting Ltd		
Brickfields Business Park	Contact:	Nick Southern
Gillingham	Email:	nsouthern@dextragroup.co.uk
Dorset	Telephone:	07715697132
SP8 4PX	Reference:	Heaton Hall

The Contractor shall note the luminaire schedule is appended to this specification.

This shall comprise of integrated emergency inverter packs within various luminaires, or remote emergency packs located within the ceiling void.

These luminaires shall be wired via the local lighting circuit using the three-plate principle, with the final connection via a four-pin plug in ceiling rose.

The test facility for all emergency luminaires including maintained emergency exit signage shall comprise of a key switch which shall be included within a gridswitch assembly. The gridswitch plate shall be engraved “Emergency Lighting Test Facility”. All key switches shall be installed adjacent to distribution boards they are supplied from.

The Contractor shall include to test and commission the complete installation.

The mode of operation shall be maintained versions where luminaires are installed with integral emergency versions, and non-maintained for bulkhead luminaires and emergency exit signage.

The Contractor shall include to supply and install emergency lighting identification reference labels for each individual luminaire. The identification reference labels shall be a Traffolyte label 10mm x 30mm block letters on a white background and shall relate to the test sheets and identification references detailed on the as-fitted layout drawings.

The Contractor shall supply an emergency lighting logbook with a separate test log sheet for each emergency luminaire. Each emergency luminaire test log sheet shall be completed by the electrical Contractor on system demonstration and handover detailing the following:

- Emergency lighting identification reference
- Manufacturer
- Model reference number (mode of operation, duration)
- Installation date
- As Fitted drawing reference number

Inclusion shall be made to carry out emergency lighting light level reading on a $4m^2$ grid pattern during hours of darkness.

All testing schedules shall be handed over to the Contract Administrator.

The Contractor shall include to supply and install emergency escape route signage in accordance with BS 5499 Safety signs code of practice for escape route lighting and BS EN ISO 7010 Graphic symbols safety colours and safety signs – registered safety signs.

The Contractor shall ensure the emergency escape route signs are supplied and installed with the appropriate directional arrows in line with BS5499 escape route signs (meaning and use of graphical symbols with directional arrows).

All wiring shall be carried out using the back-outlet principal for the external bulkhead luminaire, in the same method including test facilities as previously described.

The Contractor shall include to test and commission the complete system.

The O & M manual shall be complete with separate test log sheets for each luminaire. Each luminaire shall be complete with a reference number which shall relate to the test sheets and number indication on the As Fitted Drawings.

The test number shall be a Traffolyte label black letters 25mm high on a white background.

Static Inverter

The contractor shall supply, install, and test and commission two static inverter systems for the purpose of providing emergency lighting within the high-risk areas where it is not possible to achieve the 10% illumination criteria using conversion packs.

The unit shall be capable of supporting the load for a period of 3 hours.

Normal circuits shall be monitored for mains failure, the total number of monitored circuits to be as required by the installation. Both input and outputs shall have protection devices fitted together with earth leakage protection on the outgoing ways.

Batteries shall be valve regulated lead acid type changed via temperature compensating circuit capable of recharging to 80% duty within 12 hours of complete discharge.

Voltage regulation shall be + 0.1% and + 2%-line RMS on the battery and inverter output respectively.

Output frequency shall be 50Hz + 0.1% in free running mode, 50Hz + 0.2% in phased locked mode. Output voltage shall be 230V.

The inverter shall be enclosed in an epoxy powder coated light grey cabinet comprising 1.6mm Zintec to IP23 standard. Operating parameters shall be 10°C to 30°C, relative humidity 40% - 90%.

The unit shall be capable of performing a monthly discharge test to BS 5266 and alarms (audible and visual) shall be provided for battery low level, charger fail, load alarm, over temperature.

A 2-line, 16-character LED display shall display various voltages and current readings associated with the battery and output sections of the inverter together with providing visual indication associated with the automotive testing regime.

The static inverter shall be as per the Kohler Power EL100XA, 3.5KVA static inverters and integral 8 Way SP&N distribution boards complete with 6 AMP MCB or approved equal.

13. EXTERNAL LIGHTING

Background

It is noted that currently Heaton Hall does not have any external flood lighting working to highlight the historic building features. The existing lighting was removed following faults in 2000 and never being reinstalled on the grass verges.

New Proposal

We are proposing to install new external floodlighting to the front and rear elevations of the building using where possible the existing positions of previous lighting locations within the grass verges on both sides of the building. New ducting and excavations will be required with a concrete structure required to protect each floodlight from any vandalism.

The selected floodlight is the Dextra Colour Glide Flood which brings a powerful and versatile flood light solution with auto addressing DMX control and two beam angles resulting in offering over 5000 lumen output and beam angles of either 40×40° or 8×8° to the building.

The flood allows architectural features to be effectively highlighted in range of colours creating exciting effects which can be easily and quickly adjusted to suit any event or theme and seek to create excitement and interest in our public spaces.

The flood is a high lumen output RGBW floodlight, supplied with die cast aluminium housing, external RAL 9006 Grey paint finish, toughened glass cover with lensed optic and adjustable saddle bracket, these design features combine to ensure quick and simple installation, effective performance, and excellent longevity.

The floodlights require both Mains Power and DMX supplies and are controlled through a central control unit complete with POE switches for the DMX data control and an external portable glass screen touch controller which can modify each floodlight individually and combined

The Contractor shall include to supply, install, test and commission a complete external lighting system. All external lighting shall be designed in line with CIBSE Guide, ILE requirements and BS5489.

The Contractor shall contact:

Dextra Lighting		
4 Pinemore Road	Tel:	0151 724 2099
Liverpool	Contact:	Nick Southern
L18 4PD	Ref:	Heaton Hall

to supply all external lighting floodlights and brackets.

13.1 Building Lighting

The contractor shall that currently the design does not include for any lighting to be mounted on the building structure due to its Grade One listing and the English Heritage requirements of protection of the building

13.2 Building - Flood Lighting from External Grounds

The method of control for each bank of external lighting circuits shall be via a digital dual channel two on two off seven days' time switch complete with a twenty-four hour back up battery facility. Emanating from this unit shall be two 16 Amp three pole contactors complete with a 230-volt coil and enclosure.

In addition to the above control arrangements the Contractor shall supply and install a Photocell on the north facing elevation, final location, and height to be agreed on site. This shall be supplied by a 3 core 1.5mm^2 XLPE/SWA/LSF cable.

The photocell shall be wired in series within the lighting control circuit.

The final location of all luminaires shall be agreed with the Contract Administrator.

The Contractor shall include for all out of hours working associated with the commissioning of the system.

The general method of installation shall be XLPE/SWA/LSF cables in trenches, method as previously described. All civil works shall be undertaken by the Principal Contractor.

The Contractor shall obtain the services of Dextra Lighting Limited to supply appropriate mounting arms to the grassed areas as detailed on the relevant ECS layout drawings.

The foundation shall be complete with a PVC duct complete with draw rope to enable cable connection.

The Contractor shall provide for approval, a foundation detail of the floodlight.

Following completion of the systems the Contractor shall carry out external lighting night-time level checks during a cloudy night. Readings shall be taken every 10m^2 up to 10m away from the building.

The Contractor shall include to design, supply, and install all associated ducted cable services associated draw ropes, identification tape to serve the complete installation as described.in the builder's works section of the specification

Any external lighting systems fixed on the building shall be complete with override switches to be located adjacent to the local distribution boards serving the associated lighting circuits. The override switch shall be metal clad grid switch assembly with the final location to be agreed on site.

14. SMALL POWER INSTALLATION

Background

It is noted that in many areas of the hall they do not benefit from any small power. It is proposed as part of the development works that all rooms have a new ring main circuit with small number of socket outlets which is generally to provide for future expansion if the hall opens up for events

The Contractor shall include to supply, install, test and commission a complete socket outlet installation. The general method of installation within the building is as follows

WEST WING –

This area was the location of the Hall's main kitchen, garden café and a number of large storage areas, the building suffered extensive fire damage in the 1960's with currently still has the exposed brickwork and timber joists.

The contractor shall supply and install test and commission FP200 White for general power serving the IP65 RCD sockets outlets which are surface mounted installed in galvanised cable basket, clipped on timber joists and protected by galvanised conduit droppers on bare brickwork

BAKERY BLOCK –

This area was the location of the Hall's bakery and a number of small storage areas, the building suffered extensive damage over the last decade and currently has exposed brickwork and timber joists.

The contractor shall supply and install test and commission FP200 White for general power serving the IP65 RCD sockets outlets which are surface mounted installed in galvanised cable basket, clipped on timber joists and protected by galvanised conduit droppers on bare brickwork

CENTRAL BLOCK –

This area is the location of many of the key rooms and ornate design of the building with the majority of rooms having deep skirting boards, plaster dado and picture rails and deep ornate cornice details particular the lighting

The contractor shall supply and install test and commission bare MICC cable installed in galvanised cable basket in agreed risers, under floorboards, in ceiling voids and clipped on timber joists and skirting boards using the existing locations where possible not to damage any further existing fabric

Note the contractor shall include to supply, install test and commission

EAST WING –

This area is the location has a number of the key rooms with ornate design of the building with the majority of rooms having deep skirting boards, plaster dado and picture rails and deep ornate cornice details which shall be treated as the central block. Small power circuits will be installed as previously described above in bare MICC cable

The contractor shall supply and install test and commission 6242B LSZH T&E cables installed in galvanised cable basket, below floorboards, above ceiling voids and in galvanised conduit or trunking where vertical drops are required for the general socket outlets

In the basement area of the east wing the installation shall be either 6491B cables drawn through galvanised steel trunking and galvanised steel conduit drops in plant rooms and 6242 LSZH cables tied to cable basket fixed to the basement ceiling spaces and galvanised steel conduit drops to outlet positions.

The cables shall be grouped in the same method as previously described for lighting circuits.

Generally, socket outlets shall be finished in antique bronze in the historic areas, metal clad in the west wing and basement areas and antique bronze in the first-floor servant areas.

The Contractor shall note that all socket outlets shall be protected using 30mA RCBO units, wired in the form of ring circuits.

The Contractor shall note that the socket outlets supplying computer equipment shall be complete with high integrity earth connections. All high integrity sockets shall have outbound rockers and each cable shall terminate into separate earth terminals.

All small power wiring associated with computer supplies shall comply with Section 607 of BS7671.

The Contractor shall include to supply and install BSEN 60309-2 plug and socket outlets to the file server and data cabinets.

The Contractor shall include to supply and install two 4mm^2 6491B Green/Yellow cables from the appropriate distribution board to any data cabinet.

Socket outlets and accessories shall be to BS 1363 ganged as indicated with appropriate boxes selected from MK Logic Plus Range.

Generally, all socket outlets shall be generally mounted at 450mm AFFL. In areas where work tops are to be fitted socket outlets shall be mounted 150mm above the work top height.

However, the final height of all outlets shall be subject to agreement with the architect and contract administrator.

The finishes and manufacture of all socket outlets shall be the same as previously described for light switches.

The Contractor shall include, supply, and install various fixed power supplies. These supplies shall range from extract fans to water heaters etc.

The Contractor shall note that hand dryers shall be fitted within the WC areas, as detailed on the appropriate drawing, manufactured by Warner Howard SM48. These shall be purchased by Manchester City Council and provided to the contractor.

The general supply shall comprise of a switched spur unit located at high level, engraved to indicate its function.

Emanating from this shall be 2.5mm2 6491B cable drawn through PVC conduit to a flex outlet plate.

Fuse connection units are to have switches indicating lights and flex outlets in accordance with BS5733. The fuse ratings within the connection unit are to be suitable for the appliance controlled.

Sockets shall be supplied via dedicated ring circuits as detailed on the ECS layout drawings and shall be protected by 32A Type C 30mA RCBO protective devices.

Ancillary circuits in the form of radial circuits shall be protected via 30mA RCBO. The sizes shall be specific to each radial circuit and as detailed on the ECS schematic layout.

The finishes of all sockets and accessories shall be PVC from MK Logic Plus range of products or equal and approved.

Where accessories are specified as metal clad, these shall be from MK Electrics Metal Clad Plus range of products or equal and approved.

The Contractor shall note, where equipment (extract fans) is not working or are in poor glazing they should not be connected back into the spur unit. The Contractor should advise the Contract Administrator.

14.1 Fixed Power Supplies

The Contractor shall note that various fixed power supplies are detailed on the appropriate drawings. Inclusion shall be made to cross-reference the drawings and in addition include to supply and install supplies for:

(i) Access Control Supplies
(ii) Fire Alarm Supplies
(iii) Mechanical Supplies
(vi) Life Safety Systems
(v) Security Systems

The Contractor shall note that the above list is for guidance only and all appropriate supplies shall be deemed to be included.

Generally, these supplies shall be in the form of radial circuit with local means of isolation at each item of equipment.

The Contractor shall include to supply and install BSEN 60309-2 plug and socket outlets to the file server and data and CCTV cabinets. These circuits shall be complete with type 3 surge suppression devices.

Final connection to these items of equipment shall be via 6491B cables drawn through a flexible conduit system.

The Contractor shall include to supply and install two 6491B Green/Yellow cables from the local distribution board to the data cabinet.

The Contractor shall include to supply and install DDA Part M colour compliant outlets or mounting frames as agreed with the Client / Architect. All socket outlets and associated accessories shall be manufactured by MK Electric, or similar and approved.

To ensure the Building Regulations (2000) Approved Document Part M – Access and Facilities for Disabled People visibility requirements, a difference of 30 points in Light Reflectance Value (LRV) is required between each accessory and its surroundings.

The Contractor shall include to attend site with the Client to establish the colour of any future accessories surroundings after final decorations to ensure the minimum 30% contrast in LRV. This may result in the installation of a white PVC accessory.

In the result of any ambiguity in colour contrast ECS Consultants shall be contacted to make the final decision.

The Contractor shall note that there must be a distinct separation of rockers on all twin socket outlets to simplify operation.

The Contractor shall note that all galvanised dado trunking shall be three compartment Cat 6 PVC with top and bottom chamfers.

Access controls, Life Safety & Security Systems

Dedicated radial supply to access control system.

13-amp fused connection units to be mounted local to door access power supply units.

Sockets Available for Filming Companies

Dedicated ring main and radial commando type socket outlets located on the first-floor main riser cupboard as per the tender drawings.

Single and Three phase Commando type switched socket outlets

Fire Alarm System

16-amp dedicated supply to feed fire alarm taken in FP200 direct from main section board (SEC01)

MCB to be clearly marked as per fire alarm specification.

13 amp fused key switch to supply main control panel and battery backup.

Mechanical Supplies

The Contractor shall supply and install all supplies for mechanical plant equipment as detailed on the layout drawing.

Generally, these shall be in the form of a dedicated radial circuit and be mounted within ceiling voids, at high level to masonry walls or on dedicated containment system.

Each item of equipment shall have a metal clad fused connection unit locally positioned. The fuse rating of the FCU shall be selected in accordance with the maximum current of each item of equipment.

External Mechanical Supplies

The Contractor shall include to supply and install all final external mechanical plant. Connections to the mechanical equipment using flexible 3039 HR cable.

The Contractor shall supply and install all supplies servicing mechanical plant.

Any external condensers shall be served via XLPE/SWA/LSF cables as detailed on the ECS layout drawings.

The cabling shall terminate into four pole TP&N 4 pole rotary isolators mounted adjacent to the condenser being served.

The Contractor shall include to mount the isolators to a floor mounted Unistrut frame.

The Contractor shall include for final connections from the isolators to each item of external plant using 6491B LSF singles cables drawn through meta flex weatherproof conduit.

15. HEATING PLANT CONTROL WIRING

The Contractor shall note that the existing plant control wiring from the existing H+V panel shall not be replaced.

The Contractor shall include to maintain all plant supplies during the works so that the heating system is maintained during term time.

The Contractor shall include to employ Heaton Hall's heating controls maintenance contractor to carry out all final connections into the plant control panel.

16. WET AREA VENTILATION SYSTEMS

The Contractor shall supply, install, and commission all aspects of the electrical installation works associated with the re-wiring of existing ventilation systems throughout the building.

All means of local isolation, circuit and control cabling shall be supplied and installed by the Contractor. The Contractor shall ascertain the precise location of all extract fans and associated controls prior to commencing work. The details given herein are for tender purposes only.

The Contractor shall note that all WC fans shall be controlled by the local PIRs which control the lighting circuits, complete with adjustable run-on timers.

Each fan shall be controlled from a PIR unit and local isolation form a 3-pole rated isolation switch, engraved “FAN ISOLATION”.

All isolators shall be located wall mounted, adjacent to each fan unit.

17. ORANGERY BLOCK - NEW KITCHEN SUPPLIES

This part of Heaton Hall is located at the end of the east wing, comprising of a single-storey construction with a flat roof and glazed external walls and was previously used as a Café and Training Centre for Manchester City Council complete with catering facilities

All services within this area are currently exposed and not in operation and as part of the electrical safety improvement works this area will have the following new installation works.

- New electrical sub mains cable from the electrical mains room located in the basement and local electrical distribution boards are to be provided following with a suitable electrical load assessment for a new Café and catering development in the future (Refer to Tender Schematic Drawing)
- Addressable Fire Alarm system and devices linked back to the main panel located in the centre block – (Refer to Tender Drawing)
- Intruder Alarm Installation covering all key areas of security and known risks of entry (Refer to Tender Drawing)

Note – No general lighting, emergency lighting, general power, CCTV, PA, and Data systems are to be installed as part of the electrical safety works

The Mains distribution system within the kitchen area shall comprise of a new 8W -8W split metered TP&N Type B Distribution Board c/w 125A main switch and ivorine label, Ref: LP 04 c/w pulsed output Metering equipment inclusive of surge protection

The Contractor shall include to supply and install new XLPE/SWA/LSF sub main cable into the new distribution board from SEC 01 in the electrical mains room

.

18. FIRE ALARM INSTALLATION

Background

Heaton Hall existing fire alarm is circa 15 to 20 years old and currently does not provide a sufficient protection to the building and is in need of improving the cable management and protection to a L1 category.

New Installation

Heaton Hall is to be provided with a new 6500 Open Protocol Fire Alarm control panel, using a range of multi sensor devices to all areas. The system is to be hard wired with the exception of manual call points which will be wireless using a range of wireless translator modules and devices creating hybrid communication via radio technology.

The 6000PLUS/OPHTCO/S sensors to be provided within Heaton Hall will provide the client with total confidence that when the sensors are initiated, there really is a fire threat within the building. The sensor incorporates infra-red light scattering for smoke detection, with thermal enhancement of the optical sensitivity, temperature detection equivalent to grade A2, and a third channel incorporating a carbon monoxide (CO) sensing element.

The combination of optical smoke, heat, and carbon monoxide gas sensing technology within one fire detector head provides the ideal solution. The sensor can now detect free burning chemical fires, fires producing smoke and low levels of CO and heat, to deep seated smouldering fires, which produce little heat and smoke but large amounts of CO. Combining the results from all sensing channels enables rapid fire detection with rejection of false alarms and increased sensor reliability.

The 6000/PLUS/OPHT sensors will also be provided within Heaton Hall. This dual technology multi-criteria fire detector uses detection of smoke by scattering of infra-red within the optical chamber coupled with thermal enhancement of the optical sensitivity, as well as providing temperature detection equivalent to grade A2.

The 6000/WLS/HLI translator will be used to create hybrid communication between the wireless devices and the 6500-control panel. The Translator Module is one of the core components of the intelligent hybrid fire detection and alarm system. When connected on to a compatible loop, the unit is capable of linking up to 32 fully intelligent wireless field devices with the fire alarm system. The translator allows fully intelligent and seamless integration of the wireless devices alongside standard wired devices

Fire Alarm Stables / Café Facility

Due to the obsolescence of the existing 6300 Fire Alarm Control Panel the electrical contractor shall include to upgrade the existing control panel toa fully Open Protocol 6500 System. The existing loop field wiring, 6000/plus loop devices and the current C&E / programming shall remain the same and set to work on the new 6500 control panel. The 6500-control panel shall have the facility to link to the proposed Heaton Hall for fire and fault signal, this will be either hard wired or via IP Interfaces (TBC).
.

The Orangery

The Orangery will be provided with a new 6500 Open Protocol Fire Alarm control panel, using Protec's range of 6000/plus devices to all areas. This fire alarm control panel will be stand-alone signalling common fire and fault signals to the Heaton Hall 6500 Control Panel via Interfaces.

The Contractor shall include to supply, install, test and commission a complete new analogue addressable fire alarm installation including all associated control and detection devices as detailed on the appropriate drawings to comply with the requirements of BS 5839-1-2002.

The Contractor shall note that the fire alarm equipment shall be manufactured and supplied through:

Protec Fire Detection PLC.
Protec House
Churchill Way
Nelson
BB0 6RT

Contact: Steve Bell
Email: steve.bell@protec.co.uk
Telephone: 07791 796 373
Ref: Heaton Hall

18.1 List of Equipment

A full list of equipment for the buildings including all product codes, associated descriptions and quantities are included within the specification as follows '

2No 6501E/P/C 1 Loop Control Panel, Complete with Printer and Charger

1No 6504E/P/O 4 Loop Control Panel, Complete with Printer, no Charger

1No o6000/16ZAI 16 Way Zone Alarm Interface Unit (Requires 24-volt Supply)

5No 6000/MICCO Monitored Input Clean Contact Output Interface Unit, Flush 2 Gang Plate

5No MICCO/BOX Mounting Back Box for MICCO & ZAI

2No 6000PLUS/HT/SVAD Heat Sensor Complete with Sounder and LED VAD

7No 6000PLUS/OP Optical Smoke Sensor

40No 6000PLUS/OPHT Optical Heat Sensor

67No 6000PLUS/OPHT/S4 Optical Heat Sensor Complete with Sounder

2No - 6000PLUS/OPHT/VAD Optical Heat Sensor Complete with LED VAD

23No - 6000PLUS/OPHT/SVAD Optical Heat Sensor Complete with Sounder and LED VAD

6No - 6000PLUS/OPHTCO Optical CO Heat Sensor

18No - 6000PLUS/OPHTCO/S Optical Heat CO Sensor Complete with Sounder

2No - 6000PLUS/OPHTCO/SVAD Optical Heat CO Sensor Complete with Sounder and LED VAD

167No - 6000PLUS/BASE Sensor Base

21No - 6000/MCP Manual Call Point Complete with Isolator

21No - MCP/BOX Standard Red Mounting Box

3No - 6000/WLS/HLI Protec Wireless Translator Module (Loop Powered)

9No - 6000/WLS/MCP Wireless Manual Call Point C/W Back Box and Batteries

9No - HFW-CPC-01 Transparent cover for use with all standard Manual Call Point

1No - 9800EN-38AH-4 Quad Path Battery Charger - 8A Charger, 38 Amp Hour Batteries (For Two Panels)

1No REDCARE ULTIMATE Primary Path has a Built in Broadband Hub that Connects to a Private Redcare Broadband Service WLR3 Line, Secondary Path 4Go

1No - RADIO SURVEY RADIO SURVEY FOR WIRELESS EQUIPMENT (PER DAY)

8No - COMMISSION PERIODS UPTO 7.5 HOURS STANDARD AREA 9AM - 5PM

3No - LOG BOOK Fire Alarm Log Book

21No - MCP/PC Transparent Hinged Cover for MCP Call Point

Contractor to include to supply, install and test and commission an additional 20No smoke detectors complete with associated FP200 Red cabling to be located within the roof void spaces Final decision for the detectors to be installed within the void area will be made once on site by the contract administrators following a full risk assessment on future maintenance requirements.

NOTES

1. THE PROJECT HAS INCLUDED FOR A 4 LOOP 6500 OPEN PROTOCOL FIRE PANEL FOR HEATON HALL EAST & WEST WINGS
2. THE PROJECT HAS INCLUDED FOR A 1 LOOP 6500 OPEN PROTOCOL FIRE PANEL FOR THE STABLE BUILDING ATTACHED TO HEATON HALL
3. THE PROJECT HAS INCLUDED FOR A 1 LOOP 6500 OPEN PROTOCOL FIRE PANEL FOR THE ORANGERY BUILDING
4. THE ORANGERY F/PANEL AND THE STABLE F/PANEL WILL BE STANDALONE INTERFACED TO HEATON HALL FOR FIRE AND FAULT SIGNALS.

5. THE PROJECT HAS INCLUDED FOR WIRELESS MANUAL CALL POINTS IN AREAS OF HEATON HALL WHERE CABLING CAN'T BE CLIPPED TO THE BUILDING FABRIC.

6. VOIDS IN ALL AREAS OF HEATON NEED TO BE SURVEYED ON SITE BEFORE FINAL QUANITIES CAN BE CONFIRMED.

7. THE FIRE DAMAGED WEST WING TO HEATON HALL HAS BEEN PROVIDED WITH LIMITED AUTOMATIC DETECTION UNTIL THE AREA HAS UNDERGONE A FULL REFURBISHMENT.

8. REDCARE MONITORING HAS BEEN INCLUDED FOR THE HEATON HALL 6500 FIRE ALARM SYSTEM (BT LINE OR IP DATA POINT BY OTHERS)

Fire Alarm Control Panel

The Fire Alarm Control Panels would include the following features: -

- Fully Open Protocol
- 100 Secret Until Lit Zone LED Indication
- Full Colour 7" Resistive Touchscreen Display
- Integral printer for the ability to print out all fire and fault activities (optional)
- Secure Network of up to 64 Panels
- Recessed Bezel (optional)
- 2-4 Loop Up to 200 addresses per loop.
- Key switch to isolate plant interfaces during routine testing (main panel location).
- 6 Programmable key switch inputs.
- 3 Programmable Sounder Outputs.
- 3 Programmable Clean Contact Outputs (NO/C/NC)
- Terminal for connection of signal to BT Redcare Monitoring System.

Power Supplies

Standby battery and battery chargers will be provided & housed in a wall-mounted purpose-built steel enclosure. **Batteries** will be of the low maintenance sealed lead acid type, trickle charged via an automatic constant voltage charger unit.

- Standby Period 72 Hour.

- Alarm Period 30 Minutes

The general method of installation for the fire alarm shall comprise of FP200 Gold (Red) cables, wired in the form of a loop. The conventional system shall comprise of radial circuits.

The general method of installation shall comprise of 2 Core 1.5mm^2 FP200 Gold (Red) cables. These cables shall be tied to a system of cable basket within ceiling voids.

Where cables are installed externally within ducting in a trench, the Contractor shall include to supply and install FP400 cables.

All cables which supply automatic detectors shall terminate into surface mounted galvanised steel conduit boxes.

Automatic detectors shall also be located within any ceiling void greater than 800mm deep.

The Contractor shall note that various detectors within the hall shall be complete with loop powered sounders with beacons. Separate sounders and beacons shall be fitted in WCs and other areas as indicated on the drawing.

All FP200 Gold cables shall be terminated using PVC stuffing glands.

The cable clipping shall be carried out in a neat and inconspicuous manner.

Where cables are installed surface, they shall be enclosed in galvanised conduit or clipped direct

In all other areas the cable shall be clipped direct using 'P' type clips screw fixed using brass roundhead screws.

18.2 Electrical Supply to the Fire Alarm Panels

The Contractor shall include to supply and install a mains supply to the proposed fire alarm panels.

The general method of installation shall be a 2 Core 2.5mm^2 FP200 Gold (Red) cables, installed within by the same methods as previously described.

The cable supplying the Heaton Hall system shall emanate from a 16 Amp SP MCB located within the MCCB Section Board within the switch room.

18.3 Power Supplies

Standby battery and battery chargers will be provided and housed in a wall mounted purpose-built steel enclosure. Batteries will be of the low maintenance sealed lead acid type, trickle charged via an automatic constant voltage charger unit.

Standby Period 24 Hour (based on monitoring of faults)
Alarm Period 30 Minutes

Final connection to the fire alarm panel shall be via 1.5 mm^2 LSF singles cables enclosed via a conduit coupling.

The fire alarm should be linked to the Nursery building utilising the existing link and the charging unit shall be supplied as previously described from the load Nursery distribution board.

18.4 Fire Alarm Manufacturers

The same manufacturer who is selected to supply the fire alarm equipment shall also commission the system upon completion. The fire alarm system manufacturer shall be Protec Fire Detection or similar and approved. The system shall have open protocol.

18.5 Fire Alarm Installation Equipment

Fire alarm control panels to be in accordance with BS 5839: Part 4: 1988 and satisfy the requirements of EN 54 Part II.

Renewal of any detector from the circuit shall not affect the operation of any manual call point. Removal of a detector or call point shall generate a fault signal at the panel. All the sounder circuits and detector circuits are to be monitored for open and short-circuit. All components forming part of the fire alarm installation shall be mutually compatible. Where there is no relevant British Standard, non-standard components may be used, provided that they are fit for their purpose.

The fire alarm control panels shall be **surface mounted** and shall be constructed using a steel body and steel fascia.
Each zone is to give indication of:

(i) Fire/Zone No. (Red)
(ii) Fault/Zone No. (Amber)
(iii) Alarm Silenced (Amber)

Additional fault/disconnected battery or charger fault (Amber)

Each indication is to be lit by two lamps and a facility for lamp test is to be provided. An evacuation facility is also to be provided.

An engineer's test switch is to be provided to allow for one person testing of the system, with indication when in use together with a warning signal.

A battery charger, 5-amp, 24-volt DC output and suitable ampere hour sealed lead acid battery is to be installed within the panel.

Renewal of any detector from the circuit shall not affect the operation of any manual call point. Removal of a detector of call point shall generate a fault signal at the panel. All the sounder circuits and detector circuits are to be monitored for open and short circuit. All components forming part of the fire alarm installation shall be mutually compatible. Where there is no relevant British Standard, non-standard components may be used, provided that they are fit for their purpose.

18.6 Zone Arrangements

The fire alarm system zoning requirements will be discussed and agreed with the country house during the initial commencement of construction works.

The Contractor shall include for arrangement meetings with the Hall, Contract Administrator and Electrical Designer to agree the final zoning layouts.

18.7 Fire Alarm Equipment Specification

The automatic fire alarm installation shall be connected and wired as a fully monitored system and shall comprise: -

18.8 Control and Indicating Equipment

Main fire alarm control panel with addressable loops would be located in the following areas: -

- Heaton Hall near Reception
- Stables Office Reception
- Orangery

Repeater panels are required.

The fire alarm control panel would include the following features:

- Fully open protocol
- 100 secrets until lit zone LED indication
- Full colour 7" resistive touchscreen display
- Integral printer for the ability to print out all fire and fault activities (optional)
- Secure network of up to 64 panels
- Recessed bezel (optional_
- 2-4 loop, up to 200 address per loop
- Key switch to isolate plant interfaced during routine testing (main panel location)
- 6 programmable key switch inputs
- 3 programmable sounder outputs
- 3 programmable clean contact outputs (NO/C/NC)
- Terminal for connection of signal to BT Redcare Monitoring System

18.9 Fire Alarm Wiring Details

The wiring of all automatic detectors and automatic detectors incorporating sounders and white strobes shall be in the form of ring circuits. The circuit shall be earthed at the panel at both ends, spurious incidental earthing shall be avoided.

The wiring shall be carried out in the method as previously described.

The alarm output circuit wiring shall be on the ring circuits from the main panel.

This wiring shall be carried out in the same method as previously described.

Where more than two cables are installed together, they shall be enclosed within PVC mini trunking. The mini trunking shall be coloured to match existing finishes, as previously described for PVC conduit systems.

The cables within the mini-trunking shall be clipped within the mini-trunking to the wall every 4000mm.

All cables tied to a system of cable basket shall be complete with PVC cable ties and metallic cable ties every two metres.

18.10 Servicing

The Contractor shall include for an A4 sized fire alarm system log book.

The Contractor shall include to advise the client on the operation of the system.
Two weeks prior to the proposed commission date, the Contractor shall provide for approval of the following data for each address: -

(i) Zone number
(ii) Location and orientation description of each address
(iii) Reference number

This information shall be in tabular form on an A4 sized sheet. This shall be submitted to the contract administrator for approval.

Following approval, all data shall be handed to the commissioning engineer prior to the commissioning of the system.

All detectors and remote indication LEDs shall be complete with Dyno tape label.

Each detector shall be specifically referenced. These references shall be the same as those indicated on the mimic diagram.

The lettering configuration on the Dyno tape shall be white letters on a red background.

The referencing system shall comprise of four separate parts. The first part shall indicate the loop number e.g., Loop One shall be L1.

The second part shall indicate the zone number, e.g., Zone 7 shall be Z7.

The third part shall indicate the type of detector. This shall be one of the following types.

Detector	**Abbreviation**
Ionisation Smoke Detector	IS
Optical Smoke Detector	OS
Fixed Temperature Heat Detector	FH
Rate of Rise Heat Detector	RH
Manual Call Point	MCP
Remote LED Indicator	RI

The fourth part shall indicate the detector number.

For example, if an ionisation smoke detector was the fifth detector and was on zone number three, then the reference would be L1//Z3/IS/05.

18.11 Fire Alarm Interface

The Contractor shall include to provide system interfaces such that if the fire alarm system is actuated the systems detailed below will be controlled in the following manner:

(i) Boilers to shut down
(ii) Access control system to release
(iii) Fire Doors Magnetic Holders
(i) Gas Shut Off - Kitchen

18.12 Mimic Diagram

The Contractor shall include the provision of £550 (Five Hundred and Fifty Pounds) to obtain the services of: -

ECS Consultants Limited
148 Stockport Road
Cheadle
Cheshire
SK8 2DP
Tel: 0161 283 2882
Fax: 0161 282 8825

or a similar specialist, for the production of one A3 sized Mimic Diagram within frames to be located adjacent to the Main Country House Fire Alarm Panels.

Prior to the final production of the final version mimic diagram, the above specialist, or similar, shall issue a draft drawing. The Contractor shall include to check these drawings for accuracy and orientation and issue back to the specialist for final production.

The Contractor shall include to collect the completed mimic diagrams from the specialist's office, take to site and screw fix, using wood screws to the wall adjacent to the fire alarm panel and repeater panel.

18.13 Networking of the Fire Alarm System

The Contractor shall note the requirement to include to supply and install a new Redcare device to an Advanced Extra IP/GPRS

The Contractor shall note that the proposed emergency line system shall be a VOIP system backed via a dual sim GPRS, this shall cover

I. Emergency lines for life safety systems
II. Emergency lines for security systems.

The Contractor shall include to carry out all on site liaison and co-ordination with the telecom operator to facilitate the changeover to the new device.

.

The Contractor shall include for all costs associated with supply, installation, and monitoring of the alarm equipment for the first 12 months of the installation (excluding service call out charges).

The cable shall be installed in the same method as has been previously described.

The Contractor shall fix the communicator equipment and to carry out all necessary final connections, carry out all associated administration functions and commission the communication element of the works.

The Contractor shall include to link the fire alarm system to an emergency services control room that provides fire alarm signalling. The alarm monitoring shall be via Aim Monitoring, Tel: 0844 800 1605.

Under the proposed scheme the Contractor shall include to supply and install a 2 Core 1.5mm^2 FP200 Gold (Red) cables from the proposed fire alarm panel to the communicator position. Inclusion shall be made to supply and install 50 metres of FP200 cable to the existing communicator position.

The cable shall be installed in the same method as has been previously described.

18.14 Testing and Commissioning

The Contractor shall obtain the services of the system Manufacturer to test and commission the complete system.

The Contractor shall include for all phased system commissioning. All commissioning shall be undertaken out of hours.

18.15 Servicing and Maintenance Requirements of Existing F.A. System

During Construction

The Contractor shall include to carry out all servicing requirements in accordance with BS 5839 following the commencement or any works to each phase existing fire detection equipment.

The Hall's current fire alarm specialist managing the existing installation is and can be used for any small repairs to the existing system if required: -

Churches Fire & Security
Fire House,
Mayflower Close,
Chandler's Ford,
Eastleigh
SO53 4AR

Telephone: 0370 608 4350
Reference: Heaton Hall

Upon Completion of Each Phase and Final Completion

The completed installation shall then be serviced in accordance with the requirements of BS 5839 and the Contractor shall include for the complete systems to be serviced in accordance with BS 5839 for the first 12 months following final handover. This shall comprise of two six monthly visits. These servicing works shall be carried out by Protec.

19. INTRUDER ALARM SYSTEM

Background

It is proposed to rewire the existing intruder alarm system specifying a series of grade 3 anti- mask detectors/sensors rather than the shock sensors that are currently fitted to windows. This will allow cabling systems currently installed in an untidy fashion to these windows to be removed carefully and new cabling to the movement sensors to be installed within voids, store rooms and clipped carefully within the fabric of the building (windows, door frames).

New Installation

The new intruder alarm has been designed to Grade 3 which covers premises which are deemed to be at substantial risk from intruders due to high-value contents. The project requires the installation of new Pyronix TMD 15, Grade 3 type Anti-mask detector which provides 15m of volumetric coverage in both PIR lenses and is ideal for this application and high-quality environments.

This allows the project to install one detector in most areas, to give dual sequential confirmation alarm cutting down the number of cables being installed and the installation of window alarm contacts on the shutters resulting in an improved installation to the historic internal areas of the building.

The two independent detectors within the one housing featuring non-overlapping fields of view with sequential confirmation. Dual Technology (DT), Passive Infra-Red (PIR) on a single activation would notify key holders, off a sequential alarm mainly it would notify key holders and the police.

Roof detection.

The project is also installing outdoor ready network radar detector (AXIS D2110-VE Security Radar) on the roof security This outdoor-ready network radar detector from Axis utilises advanced radar technology to provide reliable breach protection, it is intended for monitoring open areas. The device delivers accurate, round-the-clock incident notifications in all weather conditions with extensive 180° horizontal area coverage. It also features built-in analytics and smart coexistence functionality, as well as PoE-out support which enables the powering of additional devices.

CCTV Equipment Linked into Intruder Alarm Radar installation

The contractor shall note that within the CCTV works section the following items have been included for the contractor to supply, install test, and commission a new combined motion detector CCTV camera linked into multi speech control units on the hall roof area protecting access from the orangery building comprising off the following equipment.

- 2No - GLD D-Tect 2 External Motion Detectors - reference GJD300W
- 2No - Hanwha 4Amp IR Outdoor Vandal Dome Camera Reference – ANV-L7082R
- 2No - GLD Multi Speech Kit complete 4 channel voice enunciation kits with recordable messages Reference GJD090 Mult speech 4 Kit includes 8Watt 8Ohm Horn Speaker, Power Supply Unit all enclosed in Weatherproof box
- 2No – Cat 6 data outlet points -

The Contractor shall include to obtain the services of:

IDS Alarms
Unit 7,
The Pavilions,
Bridge Hall Drive,
Bury
BL9 7NX

Telephone: 07931 698686
Contact: Ian Smith
Reference: Heaton Hall

to supply, install, test and commission a complete Intruder Alarm System. This system shall be of a standard to have Grade 3 police response.

The system shall comply with:

(i) EN 50131
(ii) NSI Regulations
(iii) Health and Safety at Work Act 1974
(iv) PD6662:2004
(v) NACOSS Regulations
(vi) 18th Edition IET Wiring regulations
(viii) DD243: 2002
(ix) ACPO – Association of Police Officers

Prior to commencement of works, the Contractor shall submit for approval a complete schedule of proposed equipment to be used in the installation set against the list of equipment highlighted in this specification.

The Contractor shall liaise with the contract administrator in order to approve the colour of the external bell boxes.

The main electrical contractor shall note that he is responsible for the supply and installation of the primary and secondary containment (galvanised cage) throughout the country house but IDS will

supply and install all new network cabling, keypads expander units, PVC mini trunking where applicable as follows.

19.1 Schedule of Equipment

The contractor shall supply, install, and test and commission the following equipment.

14No -Grade 3, Large White, Surface Mounted Magnetic Contact.

8No - Grade 3, Passive Infra-Red Movement Detector with Microwave Technology Anti-Mask Facility configured for 15m x 15m coverage with 90-degree angle.

77No - Confirmed Passive Infra-Red Detector.

1No - Texecom Grade 3 (168) multi-circuit microprocessor-based control unit.

4No - LCD Proximity Premier Remote Keypad.

5No - Boxed 8XP, Grade 3, Environmental Class II, System Expander Module with 8 inputs, 8 outputs & 1 speakers drive output.

5No - Premier Elite 8XP, Grade 3, Environmental Class II, System Expander Module with 8 inputs, 8 outputs & 1 speakers drive output complete with 2 Amp PSU

5No - AXIS D2110-VE Security Radar smart network-based security device that uses advanced radar technology to deliver wide 180° coverage, monitoring open areas. The radar is mounted 3.5 above ground, with built-in analytics developed using machine learning and deep learning, it can accurately detect, classify, and track people and vehicles with a low false alarm rate.

1No - Supply and program Proximity Fobs. (Pack of 5)

1No - 12V 7.0 Amp Battery

.

1No - 16-ohm Internal Sounder.

1No - Grade 3, Environmental Class IV, external self-actuated siren

.

1No - Decoy bell box.

Note - Dualcom connections to be supplied by Manchester City Council.

The intruder alarm cable will be LSZH screened alarm cable BS4737-3.30 TYPE 1 & 2 installed in galvanised cable basket, PVC conduit and clipped on timber joists

- Type - Alarm Cable LSZH to BS4737 3.3 Type 1 mainly within the decorative house areas
- Type - Alarm Cable LSZH to BS4737 3.3 Type 2 Duct Grade PVC sheathed in basement area, west wing
- Type – Alarm Cable LSZH Data-Guard (SWA) to BS4737 3.3 Type 1 on the roof

19.2 Installation

In the United Kingdom the alarm system must be installed and maintained by a company which is recognised as an installer of intruder alarms by either the National Security Inspectorate (NSI) or the Security Systems and Alarms Inspection Board (SSAIB). It must also be recognised as a Compliant Company by the relevant responding police force. Remote signalling must be to an Alarm Receiving Centre which is inspected and certified by NSI or SSAIB.

19.3 Control Equipment

Except for ancillary control equipment and keypads which are recognised by NSI as Type A and which must not be visible from outside the building, control and signalling equipment must be located in a position where it is concealed from general view and is least vulnerable to attack.

The system must be designed to record and store the events (including the time and date of each) defined below, which have occurred within the preceding 30 days. The system must be capable of recording a minimum of 100 events and producing a hard copy record of events.

Where the number of recordable events during a 30-day period is likely to exceed 100, the event recording capability must be extended accordingly. More than 3 consecutive events of the same condition need not be recorded.

Events and information for recording purposes include setting, unsetting, reset, any activation, fault, isolation or an inhibit of any part of the system, transmission failure including loss of capability to transmit, tamper conditions, valid user codes, alterations to clock and software and loss of mains power.

The event records must be retained for at least 30 days in the event of a power failure.

Event recording may take place at the control panel and/or at a remote location.

Where there is remote signalling, the control and indicating equipment installed at the protected premises must provide the alarm user with a clear indication of loss of any signalling path availability:

(i) During the unset period at the time that the signalling path is lost, and
(ii) At the time of setting the system (if the fault still persists).

This requirement applies irrespective of whether the lost signalling path is the sole means of remote notification or is one component of a dual-signalling system.

19.4 Setting/Unsetting

The means of unsetting the system described in paragraph 6.4.4 of DD 243: 2002 (whereby opening the initial entry door will disable all means of alarm confirmation throughout the protected premises) must not be employed.

Time delays incorporated into the entry route to be kept to a minimum to allow entry/exit without causing false alarms e.g., by use of Type A remote keypads (those in which processing of the code is not carried out) in conjunction with a main panel located in a secure area. The total delay including secondary timers when used must not exceed 1 minute.

Detectors incorporated into the final exit route should create an alarm condition if their activation is not preceded by the initiation of the correct unsetting procedure.

For systems incorporating remote signalling, set and unset signals must be transmitted to and logged at the alarm receiving centre.

19.5 Warning Devices

Audible warning must be by either two external self-actuating audible warning devices OR one external self-actuating warning device and an internal self-actuating siren or two tone electronic sounder, each giving a sound emission of at least 100dB at 1 metre.

All external warning devices shall have the mechanisms and circuits enclosed within a metal housing and be designed to detect or resist the injection of foam.

Where there is a single external warning device installed and it is sited below 3 metres in height (i.e., within reasonable access from ground level), this must always be supplemented by a second external self-actuating warning device. This second external warning device to be sited on a different elevation of the premises if possible.

All warning devices must be instantaneous in operation unless:

A delay is required by the local Police Force Intruder Alarm Policy in which case the delay shall be for the minimum duration specified in that Policy and clearly stated in the intruder alarm specification or an audio confirmation alarm system is installed.

Any such delay must be automatically removed in the event of loss of remote signalling capability or withdrawal of police response. This applies irrespective of the method of confirmation (if any).

Where the system has remote signalling, any internal warning device must be sited remotely from the control panel so as not to identify the position of the panel when activated. For the same reason, any internal sounders used as part of the alarm setting/unsetting procedure must also be sited remotely from the control panel.

19.6 Detector Equipment

Preference should be given to the use of equipment appearing on the current Loss Prevention Council List of approved products and services if suited to the purpose.
When the system is in test mode only it shall be possible for one person to check the area of detection of all movement detectors.

In areas where there is a possibility that detectors could be subject to compromise (e.g. unsupervised access by members of the public), consideration should be given to the use of detectors incorporating anti-masking features.

19.7 Confirmable Alarm Systems

The whole system to be designed and configured such that when an intruder enters any part of the protected premises there is a high degree of certainty that the alarm system will deliver a confirmed alarm messages.

Signalling must be via an acceptable dual-signalling system such as RedCare GSM or Dualcom GPRS (with grade 4 signalling).

The Contractor shall note the requirement to include to supply and install a new Redcare device to an Advanced Extra IP/GPRS

The Contractor shall note that the proposed emergency line system shall be a VOIP system backed via a dual sim GPRS, this shall cover

i) Emergency lines for life safety systems
ii) Emergency lines for security systems.

The Contractor shall include to carry out all on site liaison and co-ordination with the telecom operator to facilitate the changeover to the new device.

Following the cancellation of an alarm signal the system must re-arm without any zone, sensor or detector being locked out so that the whole system remains alert to signal further alarm information during the set period.

To prevent tampering once the system has been set, all microphones and cameras intended for confirmation purposes must be located within areas covered by intruder alarm detection devices.

Audio and visual confirmation technologies must not be used in isolation. Detectors used with audio or visual confirmation must be configured to provide a back-up sequential confirmation capability.

All control and signalling equipment other than remote keypads must be located so that it cannot be accessed whilst the alarm is set without creating a confirmed alarm condition.
The alarm specification must include the actions to be taken by the alarm receiving centre upon receipt of the following alarm messages or information:

- A confirmed alarm condition (including circumstances where the loss of one or more signalling paths contributes to the confirmation criteria)

- An unconfirmed alarm condition (including any variations according to whether or not the system can be rearmed in its entirety)

- A telecommunications failure (including the failure of one telecommunication patin a Dual-path signalling system)

Following completion of the installation, the Contractor shall provide:

1. Certificate of Compliance.
2. Completion Certificate.
3. Handover Checklist.
4. Record of Operation checks

a further copy of the above shall be contained within the O and M Manual.

The Contractor shall also include to demonstrate the complete system. This shall be witnessed by the contract administrator.

The system shall provide twin knock protection in all areas enabling the issue of police unique reference number.
The Contractor shall include all associated costs in providing an autodial link comprising of the Digicom Eight channel communicator linked to a Control Room, should the client require such a service.

The communicator shall be enclosed within an adaptable box within the data room. This shall be located adjacent to the incoming telephone line.

The Contractor shall include to include all costs associated with the Digicom Communication system and associated set up paperwork.

The Contractor shall include to make the final connections to the communicator to facilitate the function of the fire alarm system.

Following installation, the Contractor shall commission the system. The commissioning shall be phased in line with the project programme.

19.8 Servicing and Maintenance Requirements of Existing Intruder Alarm System During Construction

The Contractor shall note that the existing intruder alarm is serviced by the following supplier and the Contractor shall obtain their services: -

Churches Fire & Security
Fire House,
Mayflower Close,
Chandler's Ford,
Eastleigh

Telephone: 0370 608 4350
Reference: Heaton Hall

SO53 4AR

to undertake any emergency works, diversion and reinstallation of cabling systems and equipment to ensure that the existing system is in working order throughout the programme until the new system has been completed and handed over.

The Contractor shall include to relocate all cabling and equipment to facilitate the installation of the grid ceiling systems.

The Contractor shall note that if any existing intruder alarm wiring is damaged during the installation process, it shall be repaired at the Contractor's own expense.

The Contractor shall note that Heaton Hall has been requested to arrange the annual servicing / inspection prior to the commencement of the project and the results of the inspection will be circulated, highlighting any repairs / defects.

20. TELECOMS AND DATA INFRASTRUCTURE INSTALLATION

The contractor shall note that in the main the existing data and Wi-Fi installation will remain as existing apart from where any existing cables can be dressed into the new containment to provide the hall with an improved cable management around the building l.

NOTE - Manchester City Council has indicated that a new infrastructure may be planned for 2023 carried out by the in-house technical team If the funding and works are approved Manchester City Council will commence discussions with the principal contractor

20.1 Servicing and Maintenance Requirements of Existing I.A System

The Contractor shall note that Heaton Hall existing data and Wi-Fi installation is maintained and serviced by Manchester City Council in-house technical services and the Contractor shall obtain their services: -

Manchester City Council IT Section
Town Hall
Albert Square
Manchester
M2 5DB

Contact – To be provided
Telephone: 0161 234 4343

to undertake any emergency works, diversion and reinstallation of cabling systems and equipment to ensure that the existing system is in working order throughout the programme until the project has been completed and handed over.

The Contractor shall include to relocate all Wi Fi routers and cabling and equipment to facilitate the installation of the electrical systems if required. The Contractor shall note that if any existing Data wiring is damaged during the installation process, it shall be repaired at the Contractor's own expense.

21. EXISTING ACCESS CONTROL SYSTEM

The Contractor shall include to re-wire the existing power supply units for the access control systems.

All field wiring to the field devices shall remain and not form part of these works.

Inclusion shall be made to supply and install fire alarm interface units adjacent to each access control panel.

The contractor shall note that the tender drawings include all the existing associated equipment included in a normal access control system equipment mainly magna locks, power supply units and

push buttons etc. The tender drawing is only highlighting these items for completion of the as-fitted drawings

22. CCTV SYSTEM

Background

Heaton Hall currently has a small number of 240 volts mains CCTV cameras installed in the building to capture images from the display rooms, this system is past its expected life and is not operational currently.

The cameras are over 20 years, unsightly, quite intrusive, and large and it is proposed that new CCTV cameras are to be installed within the decorative rooms, main circulation areas and other key areas of the building.

New Installation

It is proposed to install Hanwha Wisenet IP range cameras reference (CAM M/PIXEL D/N IR 5MP 4mm IR 20) in the main building ground and first floors key areas The device is small I.P turret type camera that can be ceiling or wall mounted and are powered P.O.E.

The project includes for a number of P.O.E switches to be located at each side of the building to allow ease of installation and additional cameras at a later date. The 32-channel network video recorder can be connected to a router and can be viewed remotely by parks management.

CCTV Cat 6 cables will be installed discreetly on edges of widow frames, where existing CCTV and intruder alarms cables have been installed previously and in areas such as underfloor floorboards, stores, and cupboards to hide the cables before they enter into the main rooms on a back-to-back installation.

The Contractor shall obtain the services of:

IDS Alarms
Unit 7,
The Pavilions,
Bridge Hall Drive,
Bury
BL9 7NX

Telephone: 07931 698686
Contact: Ian Smith
Reference: Heaton Hall

to supply, install, test and commission a complete CCTV System. The system shall cover just the internal areas of the building.

The system shall be based on Hanwha Total Surveillance Solution.

.

To support the deployment of the proposed CCTV Solution and implementation of future technologies the existing fibre backbone be upgraded, and the contractor shall include for the supply and installation of new 10GbE cable links to all new switches from the NVR to allow for the speeds to be achieved. 10GbE module will need to be installed in a number of the switches

CCTV Equipment

- 22No - Hanwha Wisenet IP CAM M/Pixel D/N IR 5MP 4MM IR 20.
- 1No - SWITCH POE 8Port 30WATT 10/100 PoE+.
- 2No - SWITCH POE 16Port 30Watt 10/100Mbps PoE+.
- 2No - 6TB Hard Drive.
- 1No - Hanwha Wisenet 32 Channel NVR.
- 1No x 22" Flat Screen Colour HD 1080P Monitor

CCTV Equipment Linked into Intruder Alarm Radar installation

The contractor shall include to supply, install test, and commission a new combined motion detector CCTV camera linked into multi speech control units on the hall roof area protecting access from the orangery building comprising off.

- 2No - GLD D-Tect 2 External Motion Detectors - reference GJD300W
- 2No - Hanwha 4Amp IR Outdoor Vandal Dome Camera Reference – ANV-L7082R
- 2No - GLD Multi Speech Kit complete 4 channel voice enunciation kits with recordable messages Reference GJD090 Mult speech 4 Kit includes 8Watt 8Ohm Horn Speaker, Power Supply Unit all enclosed in Weatherproof box
- 2No – Cat 6 data outlet points

All Cat 6 cabling and containment as highlighted in the specification

At each of the proposed locations Mono will install a new CAT6 network socket to support the adoption of the proposed IP CCTV Solution

If remote access is provided by Manchester City Council during the project, then the system would require a network point installing with a static IP address adjacent the CCTV control equipment.
Note - Manchester City Council to provide

Control Equipment.

To provide around 21 days of recording, 24hrs a day with video encoding H-264 or H265. Images to be exported onto USB stick or CD/DVD

All PCs are to be supplied by Manchester City Council.

The Contractor shall include to liaise with the above specialist during tender stage and include for all appropriate power supplies and all band one containment systems.

The Contractor shall include to provide a proposal at pre-construction stage ensuring compliance with the requirements of “Secure by Design”.

Rack Mounting

The Contractor shall note that all central equipment shall be 6U rack mounted within a secure lockable cabinet to comply with the requirements of the Data Protection Act (DPA) 1998 covering the use of CCTV 2000.

The rack shall be wall mounted. The rack shall be of steel construction complete with 25% expansion and a smoked glazed door.

CCTV Test and Commission

The Contractor shall include to test, commission, and demonstrate the complete system.

All systems shall be tested, commissioned, and demonstrated separately.

The Commissioning shall involve the following processes which shall be witnessed by the Contract Administrator.

The Contractor shall include for all out of hours work associated with commissioning the systems.

NVR Devices

The Contractor shall supply, configure, install, and deploy 32 channel IDIS professional NVR devices with a built in 2TB of storage within the main server room. An additional three 6TB drives will be added to each NVR giving a total of 20TB storage capacity per NVR.

The NVR will be required to record at a minimum frame rate of 25-30 frames per second and allow continual recording for a minimum of 16 days, though with the utilisation of H.265, it is likely that 30 days will be achieved.

The NVR devices should be pre-installed with software. This will be fully configured in accordance with the Parks leadership team and recommendations from Mono during the planning phases.

A number of senior management staff's PCs will also require the remote software to be installed, allowing them access to the system, Different permission levels will need to be granted where required. The key areas that the software is to be installed are as follows:

- Heaton Hall Main Office
- Parks Division Main Office Stables

Remote viewing is also required and will be configured to allow access for Site Management Staff to view the system live from home or other places of work.

IP Cameras

The Contractor will supply and install Hanwha Wisenet IP cameras as detailed on the appropriate drawing which include 2MP fixed and varifocal domes and bullets. The camera will deliver full HD, and all include IR capabilities.

In summary, the Hanwha Wisenet IP cameras will deliver the following:

- Easy installation with Direct IP NVR
- Full HD (1080p) resolution
- Motorised varifocal lens (f=3.3 – 10mm)
- Two-way audio
- Alarm in / out
- Vandal proof / IP66 supports
- PoE (IEEE 802.3af Class 3), 12VDC
- Supports H.265 / H,264 codec
- Day and Night (ICR)
- True wide dynamic range (WDR)
- Low light enhancer
- IR LED (minimum distance: 25m)
- 3-axis mechanical design for installation
- Supports ONVIF

Software

The Contractor shall configure all aspects of the CCTV locally at the NVR's, with assistance from the Parks IT team to potentially provide VLAN information and IP address. Full planning and consideration will be required to be carried out at the initial planning meetings to discuss in more depth such areas as different users' rights and what can be viewed, downloaded, and accessed.

Once the NVR is configured, the Contractor will install the Hanwha client software on PC's as instructed by the leadership team. Centre is a central management software solution that supports live monitoring and video playback as well as advanced management tools, including event monitoring, e-maps, and condition monitoring devices.

Cat6 Cabling and Mounting of Cameras

At each of the proposed CCTV locations, the Contractor will install a new CAT6 network socket to support the adoption of the proposed IP CCTV Solution.

The proposed CAT6 connections will be housed within plastic IK rated conduit and flexible conduit will be used to minimise the over use of trunking.

The main contractor, rather than the specialist, will supply and install all the main galvanised cage containment runs internally particular in the west wing and basement areas and any external ducting or trenching for external cameras.

All network sockets shall be tested and fully documented during the installation phase. The network sockets will be routed from local network cabinets. A CCTV summary list of all equipment shall be provided by the contractor in an excel spreadsheet prior to commencing the installation works.

Visual and Literature Records

The Contractor shall record that all the above checks have been completed to the Contract Administrator's satisfaction.

These records shall be in typed format and shall be signed by the commissioning engineer.

The records shall then be filed and contained within the Operation and Maintenance Manual.

Following completion of each complete system the Contractor shall include to produce CDs detailing each camera image in both day and night situations.

Each camera image shall be for a period of two minutes.

One CD shall be handed over to the Contract Administrator. The second CD shall be left with the client.

The CDs shall be complete with typed labels indicating the site name and the words "Test Disc".

As Fitted Drawings and Operation and Maintenance Manuals

The Contractor shall include to produce two copies of as fitted drawings and an operation and maintenance manual for each site.

A further manual which shall contain all drawings and operation and maintenance data shall be handed over to the staff at the remote monitoring station.

Maintenance Manuals

Two weeks before the date of Proposed Practical Completion, the Contractor shall submit to the Contract Administrator for comment, one copy of each proposed operating and maintenance manual.

Upon receipt of comments, complete sets of these manuals shall be forwarded to the Contract Administrator.

Each manual shall be contained within a suitable folder and shall be sectionalised with inserts suitably referenced and shall commence with a comprehensive index of information included.

These manuals shall include all information necessary to operate, fault find, allow maintenance in fully equipped workshops and enabling all tests to be undertaken. They shall also include a full description of the systems installed with each part referenced to an up-to-date spare parts list.

In particular, the description of the system shall include:

(i) date the system was out of service.

(ii) a full, written description of the CCTV System control system and its method of operation.

(iii) a full circuit diagram adequately set out to allow fault finding.

(iv) a section where dated reports of the inspections and tests with observations together with records of any accidents.

As Fitted Drawings

When preparing his tender, the Contractor shall include in his price for the preparation of “as fitted” drawings.

The “as fitted” drawings shall indicate exact locations of all electrical equipment and appliances together with the routes of cables conduit runs to give a clear, concise indication of their installation together with details of routes and depth of cable ducts in relation to permanent reference points such as survey pegs building line or other approved reference.

Three weeks prior to the contract completion date, the Contractor shall submit to the Contract Administrator, for comment, two prints of his proposed “as fitted” drawings.

Within two weeks of comment by the Contract Administrator, the Contractor shall supply the following:

a) One set of black and white prints of the complete installation.
b) One set of CDs in ACAD 2014 format.

Further payment will not be made to the Contractor until such drawings and charts are received and approved by the Contract Administrator.

The “as fitted” drawings shall be forwarded to the Contract Administrator for record purposes.

Where applicable, complete schematic wiring diagrams, detailed circuit and control wiring diagrams as completed on site shall be submitted with layout drawings.

Literature, Signage and Data Protection

The Contractor shall provide the site manager with appropriate pictorial instructions literature on the operation of the CCTV system, which must be approved by the Contract Administrator and issued to the client.

Existing Cameras

At the time of the design process the existing CCTV system was not in working order the contractor shall include that the existing CCTV cameras be taken down and left in an agreed position. Existing cables and containment will also be removed without causing damage to the building fabric.

23. PLANT CONTROLS

There are no works planned for improvement to the heating boiler plant equipment throughout the Heaton Hall as these have been updated over the last five years including all associated plant wiring.

Improvements to ventilation systems in the basement serving the building shall be upgraded throughout mainly new extract fans in plant room areas.

The Contractor shall note that all wiring to the controls system shall be in LSZH cable installed in the same method as previously described.

The contractor shall supply and install 13A fused metal clad spur unit to supply the combination boiler and include for final connections.

23.1 Commissioning

The Contractor shall include for all attendance during the commissioning of these systems.

24. TELEPHONY INSTALLATION

Background

Heaton Hall currently operate an ageing analogue and digital telephony solution that requires dedicated copper wiring; however, no improvement works to the telephone installation is included in this project apart from protection of the existing system during the construction works.

25. EARTHING AND BONDING

The Electrical Contractor shall be responsible for the installation and testing of all earth bonding and connections in accordance with the current edition of the IET Wiring Regulations and to that end shall supply and install the following:

. 25mm^2 equipotential bonding conductors to

a) Incoming gas supply
b) Heating pipework from Plant Room
c) Lightning Protection System
d) Ventilation Ductwork
e) Steel Structure
f) Incoming Water Supply

All equipotential bonds shall be identified and terminate into a 38mm x 6mm earth bar located within the intake room.

Include for cross bonding the pipework for hot and cold-water pipes, waste pipes, extract canopies, across pumps heating pipes etc., in all toilets, washrooms and stores, and extraneous metalwork. The Contractor shall include to provide 4mm^2 6491B cables from local distribution boards and earth grid ceilings every 10m^2.

The Contractor shall include to supply and install two 4mm^2 6491B cables from the main earth bar to each data rack unit.

26. LABELS AND CIRCUIT CHARTS

Labels shall be fitted to all switches and fuseboards and shall be ivory or white Traffolyte type with black lettering on white background which shall be secured by round-headed brass screws. On switches, the labels shall indicate the reference number of the switch, the specified current rating, the size, and number of cores of cable controlled and the distribution or fuseboard controlled.

On fuseboards, labels shall indicate the reference number, the type of board, i.e., lighting, and small power etc., the size of cables supplying the fuseboard and where to isolate the feeder cable, Zs and PSC readings shall also be indicated on labels.

Labels shall generally not be less than 75mm x 50mm unless it is impractical for a label of this size to be fixed to the particular item of equipment.

Distribution boards shall be fitted with circuit charts attached to the inside cover and these charts shall comprise typed lists giving size, phase, function, and designation of each outgoing circuit. The labels shall either be protected by sheet of 1mm thick Perspex or enclosed within a PVC wallet. Manufacturer's circuit charts shall not be accepted.

Engraving shall also be carried out to all control switches controlling water heaters, catering equipment, boiler house equipment, fire alarm junction boxes etc. to clearly indicate the purpose of the item.

Prior to manufacture, the Contractor shall submit for approval, actual size drawings detailing the information displayed on each label.

The Contractor shall include to adjust all circuit charts to take into account room reference changes.

The Contractor shall include to supply and install clear adhesive labels indicating circuit references on all accessories.

27. TESTING, COMMISSIONING AS FITTED DRAWINGS AND MAINTENANCE MANUALS

Operation and Maintenance Manual

The Electrical Contractor shall include for the production of Operation and Maintenance manuals including all As Fitted Drawings and supply one final paper copy document and four CDs for the complete project.

The Operation and Maintenance manual shall comprise of fourteen sections enclosed within separate divided sections. These sections shall detail:

1. Introduction and Project Overview
2. Description of Systems
3. Safety and Statutory Requirements
4. Construction of installation components and equipment
5. Operation and Maintenance by the building user
6. General Maintenance and Fault Finding by Maintenance Personnel
7. Spare parts, Policy, and Procurement
8. Recommended Servicing and Log Books
9. Distribution Board Schedules and Isolation Procedures
10. Programme of Recommended System Maintenance
11. Installation Testing, Inspection, Commissioning and Tabulated Results
12. Disposal of Equipment
13. As Fitted Drawings
14. Appendix

All sections shall be typed throughout and where applicable contain tables, A4 CAD drawings and coloured photographs to supplement written descriptions.

Six weeks prior to practical completion the Contractor shall submit details of any deviations from the original specifications and all manufacturers' literature. A draft copy of the proposed Operation and Maintenance manual will then be issued to the Sub contractor for comment four weeks prior to practical completion.

Prior to submission of this document the Contractor shall have placed all necessary orders and liaised with ECS Consultants in order to provide enough information for research to be carried out to enable the document to be produced.

Following receipt of the draft document the Contractor shall include to mark on any changes in order for the final copies to be prepared.

The final copies shall be enclosed within an A4 sized four ring binder complete with external clear PVC inserts. These copies shall be complete with title covers and spine indication.

At handover the Sub contractor shall include to insert the following information:

1. Test Certificates
2. Calibration Certificates

3. Specialist System Certificates

The final copies shall be submitted to the Principal Designer (If CDM Applicable) and client at practical completion.

Following submission after practical completion if any further amendments are still required. The clients planning supervisor shall include to indicate these in black pen and fax the appropriate sheets to the above specialist. ECS Consultants shall include to send the revision back by post to the client.

The electrical Contractor shall also include to obtain the services of ECS Consultants or a similar specialist to produce As Fitted Drawings. The Contractor shall include the provision of one hundred pounds for every As Fitted Drawings and five pounds per copy.

The Contractor shall include to clearly mark up the installation drawing with the appropriate changes. These drawings shall be submitted with the comments on the draft manual two weeks prior to practical completion.

All final copy As Fitted Drawings shall be included within the Operation and Maintenance manual by ECS Consultants.

The electrical Contractor shall obtain a further full set of As Fitted Drawings. These drawings shall be rolled and fitted within 100mm x 100mm length of electrical trunking complete with lid and end caps. The trunking shall be fixed adjacent to the main switchgear. This lid shall be complete with a label “Mechanical & Electrical Record Drawings”.

In addition to the production of the above documentation, the electrical Contractor shall instruct the person in charge of the premises, or an appointed representative, in the use of the electrical installation. This should include the following:

(a) Use of switchgear and replacement of, MCB’s and RCD units
(b) Operation of local switches
(c) Operation of systems provided by the Electrical Contract e.g., fire alarms and emergency lighting
(d) Dismantling and re-assembling of lighting fittings for re-lamping and cleaning

The Sub contractor shall note that under no circumstances shall Practical Completion be issued if the following documentation is not handed over for the completion date.

i O & M Manuals
ii As Fitted Drawings
iii Test Certificates
iv Health and Safety Information

27.1 Testing

Every installation shall be tested in accordance with the relevant section of the 18th Edition of the IET Regulations in accordance with this Specification.

The Contractor shall include for all partial and full testing, to meet the phasing programme. This shall include any re-testing.

The following is considered to be the minimum testing to fulfil the above obligations.

To comply with part 7 of the Regulations, a visual inspection shall be carried out to verify that the installed electrical equipment is:

a) in compliance with the applicable British Standards (this may be ascertained by mark or by certification furnished by the installer or by the manufacturer;

b) correctly selected and erected in accordance with the Current Edition of the IET Regulations.

c) not visibly damaged so as to impair safety.

The following is a list of the principal features of an installation to be visually inspected in order to verify compliance with Regulations. It should be used both for new and existing installations and is based on chapter 71 of the Regulations:

i) connection of conductors.

ii) identification of conductors.

iii) routing of cables in safe zones or mechanical protection, in compliance with section 522.

iv) selection of conductors for current-carrying capacity and voltage drops, in accordance with the design.

v) connection of single pole devices for protection or switching in phase conductors only.

vi) correct connection of socket-outlets and lamp holders.

vii) presence of fire barriers and protection against thermal effects.

viii) methods of protection against direct contact (including measurement of distances where appropriate), i.e.

a - protection by insulation of live parts

b - protection by barrier or enclosure

c - protection by obstacles

d - protection by placing out of reach.

ix) Methods of protection against indirect contact:

a presence of protective conductors
b presence of earthing conductors
c presence of supplementary equipotential bonding conductors
d earthing arrangement for combined protective and functional purposes
e use of Class II equipment or equivalent insulation
f non-conducting location (including measurement of distances, where appropriate)
g earth-free local equipotential bonding
h electrical separation.

x) Prevention of mutual detrimental influence.

xi) Presence of appropriate devices for isolation and switching.

xii) Presence of undervoltage protective devices.

xiii) Choice and setting of protective and monitoring devices (for protection against indirect contact and/or protection against overcurrent).

xiv) Labelling of circuits, fuses, switches, and terminals.

xv) Selection of equipment and protective measures appropriate to external influences.

xvi) Adequacy of access to switchgear and equipment.

xvii) Presence of danger notices and other warning notices.

xviii) Presence of diagrams, instructions, and similar information.

xix) Erection methods.

Testing shall be carried out in the following sequence:

1. continuity of protective conductors.
2. continuity of ring final circuit conductors.
3. insulation resistance.
4. site-applied insulation.
5. protection by separation of circuits.
6. protection against direct contact by a barrier or enclosure provided during erection.
7. insulation of non-conducting floors and walls.
8. polarity.
9. earth fault loop impedance.
10. earth electrode resistance.
11. operation of residual current operated devices.

The Sub contractor shall, at his own expense, carry out all tests called for, this shall include any charges or costs for testing or re-testing, inspection and correction of faults found.

Each test shall be carried out under normal conditions of service in the presence of the contract administrator. Where items have been tested at the manufacturer's work prior to installation, the Electrical Contractor shall take all necessary steps to ensure that these conditions shall appertain to the items being put into service. Copies of such test sheets shall be included with all other test certificates upon completion. Partial test certificates shall be issued prior to access being re-occupied by staff and children.

A Completion Certificate and Inspection Certificate, as prescribed in the current edition of the IET Regulations, shall be prepared and completed in full by the Contractor who shall authorise the person carrying out the tests to sign on his behalf.

Copies of these completed certificates shall be issued as follows:

a) Contract Administrator
b) The Main Contractor (1 copy if required).

The Sub contractor shall arrange for the Supply Authority to carry out testing and inspection that may be required in addition to the above tests in order that a supply of electricity shall be connected to the installation as and when required.

In addition, the Contractor shall provide copies of all certificates of calibration used in the testing process.

28. BUILDER'S WORK

The Principal Contractor shall ensure all details of all necessary builder’s works are included at tender stage and be included within the costs.

This shall include all wall and floor chases, cutting for boxes and making good.

All holes over 75mm diameter shall be made by the Principal Contractor.

The contractor shall include to carry out all works to all the containment openings highlighted on the builder’s works tender drawing which clearly states the size and number of all openings through the wall structures

All holes below 75mm diameter shall be carried out by the sub-contractors.

All trenching shall be undertaken by the Principal Contractor.

All boxing in and painting where required

Include for all scaffolding and roofing works associated with the solar thermal system

The Contractor shall include to carry out all fire stopping of electrical and mechanical services and containment systems in line with all associated tender drawings, specifications and includes for all holes that passes through an element of building construction, such as floors, walls, roofs, ceilings, partitions, or cavity barriers and which are formed to enable the works to be completed. The works shall be in compliance with BS7671.

The Principal Contractor shall note that as part of the works, he is required to supply and install a grid ceiling system. Inclusion shall be made to co-ordinate this, and the electrical and mechanical services associated with the building rewire and mechanical pipework remodelling.

The Principal Contractor shall include to liaise with the Sub-Contractors at tender stage to supply and install a complete cable duct system complete with appropriate draw pits if required and indicated on the appropriate drawing.

The Principal Contractor shall include to excavate trenches if required and as shown on the appropriate drawings, 600mm below ground level.

The Contractor shall include to issue a detailed ducting layout to the Contractor prior to excavations commencing.

The Principal Contractor if required shall include for the supply and installation of a 100mm PVC cable duct that will run between lighting bollard luminaires.

Ducts shall generally follow the route indicated on the drawing and shall be continuous throughout their full length, between columns.

All connections of ducts shall be made using manufacturers approved joining pieces.

Any material used for ducting shall be suitable for underground installation and capable of withstanding pressure imposed from backfilled materials, pedestrian traffic and the effects of ground water freezing.

The Contractor shall ensure that inclusion is made for backfilling, making good tarmacking and removal of excess earth from site.

Prior to commencing of any civil works, the Contractor shall first obtain record drawings of service layouts within the proposed area.

29. CIVIL WORKS

The Contractor shall include to supply and install a complete cable duct system complete with appropriate draw pits as indicated on the appropriate drawing.

The principal contractor shall include to excavate trenches as shown on the appropriate tender drawings, approximately 450mm below ground level.

The principal contractor shall include for the supply and installation of suitably sized PVC multiway cable duct.

Ducts shall generally follow the route indicated on the drawing and shall be continuous throughout their full length.

All connections of ducts shall be made using manufacturers approved joining pieces.

The cable ducts shall be installed with spare draw ropes for future use.

Any material used for ducting shall be suitable for underground installation and capable of withstanding pressure imposed from backfilled materials, pedestrian traffic and the effects of ground water freezing.

The Contractor shall include for backfilling, making good tarmacking and removal of excess earth from site.

Prior to commencing civil works, the contractor shall first obtain record drawings of service layouts within the proposed area.

The Contractor shall note that should the existing record drawings be unavailable they shall include to carry out CAT Scans to all areas where new service trenches or duct routes are to be installed.

Where the cable passes through the foundation it shall be protected via an earthenware pipe.

The contractor shall include to make good the surface and dispose of any additional earth.

The contractor shall include to supply and install G.R.P. draw pits.

All draw pit covers shall be suitable for the passage of vehicles.

29.1 Cables in Trenches

All external Band 1 & 2 cabling shall be laid in segregated cable trenches at the depths prescribed in the NJUG Guidelines.

The Contractor shall lay a PVC identification tape coloured yellow complete with black lettering “Danger Electricity” over all cables.

The soil shall then be laid on the tape and compacted to 100mm below ground level. A second layer of PVC identification tape shall then be laid, and the ground made good.

The Contractor shall note that all trench works shall be carried out by the Principal Contractor. The Contractor shall issue a detailed duct layout drawing to the Principal Contractor prior to installation.

30. SEALING OF WIRING SYSTEM PENETRATIONS

The Contractor shall note that where a wiring system passes through an element of building construction, such as floors, walls, roofs, ceilings, partitions or cavity barriers, the openings after passage of the wiring system shall be sealed according to the degree of fire-resistance (if any) prescribed for the respective element of building construction prior to penetration.

The contractor shall meet BS 7671:2018 Regulation 527.2 which sets out the requirements for the sealing of wiring system penetrations, Regulation 527.2.

The Contractor shall provide temporary sealing arrangements during the erection of the wiring systems as appropriate.

The Contractor shall note that any sealing that has been disturbed shall be reinstated as soon as practicable.

The Contractor shall supply photographic evidence of all penetrations including labelling of all sealing of penetrations with appropriate date when completed

The Contractor shall ensure that metallic fire-resistant cable supports are installed within 750mm of each seal.

31. SYSTEM DEMONSTRATION

The Contractor shall include to demonstrate all electrical systems.

All demonstrations shall be carried out over a two-day period.

This shall include: -

i) Operation of MCCBs
ii) Operation of MCB
iii) Operation of RCDs
iv) Operation of RCBOs
v) Operation of LED luminaires and associated controls
vi) Operation of external lighting controls
vii) Diffuser removal
viii) Emergency Lighting Key Switch Testing
ix) Fire Alarm Break Glass Key Testing
x) Operation of Fire Alarm System
xi) Operation of the Intruder Alarm
xii) Go through the Operation and Maintenance Manuals

Prior to the commencement of any demonstrations the Contractor shall include to issue a programme of demonstrations to all parties for approval.

32. PHASE RE-BALANCING

The Contractor shall include following practical completion, to put current logging equipment into the existing mains supply for a period of fourteen days.

After the first five days, the Contractor shall provide current logs to ECS Consultants. Inclusion shall be made to undertake circuit phase swaps in line with ECS Consultants requirements.

Further logging will then be undertaken with a graph issued on day twelve. If required, minor circuit swaps should then be undertaken.

Following completion, a full fourteen-day graph shall be provided.

Inclusion shall be made to update all as fitted drawings, circuit charts and O&M manuals.

33. PREPARATORY WORKS

The Contractor shall note that various stages of the project shall be carried out whilst the building is occupied particular if English Heritage visit the site

The principal contractor builders work specification details all the protection works to the building, artwork and artefacts and building structure however the electrical contractor in order to minimise the impact of the installation process and reduce the level of cleaning following completion shall undertake the following measures within all areas.

i) Overlapping dust sheets on all floors
ii) Overlapping dust sheets over furniture
iii) Photographs of all areas, prior to works complete with all dust sheets in place or removed by MCC conservation team.
iv) Bagging and protection of all IT or data equipment (projector, IPAD chargers etc).

Following the completion of the installation works within a specific area, the Principal Contractor shall include to:

i) Make good
ii) Carry out all defects

iii) Remove all dust sheets
iv) Request MCC to replace any furniture, artwork or artefact removed at the commencement of the works
v) Re-clean the area to the original standard (**Note** - Principal Contractor to check with MCC on any cleaning agent material which has to be used on flooring etc.)

Once an area is deemed to be complete, the Contractor shall offer it for defects checks by the contractor administrator.

Following the carrying out of the above the Contractor shall include for the specific area to be re-cleaned. The contractor shall discus with Manchester City Council Central Art Division and Heaton Hall Staff on the methods of cleaning the building flooring, doors, decorative panels etc **the re-cleaning of any artwork, statues, artefacts, and decorative panels will be carried out by Manchester City Council**

The Contractor shall note that prior to any works being carried out within specific area, the Principal Contractor shall have obtained the services of Manchester City Council Arts Department: -

i) Placing of historic books artefacts in boxes
ii) Placing equipment etc. in boxes

All boxes shall be labelled and removed from the hall and stored in other building All displays shall be covered with Visqueen.

Following the completion of new re-wiring in any specific area the Contractor shall obtain the services of the same removal company to unpack all equipment and replace in original locations.

The Contractor shall include to detail all partial completion dates within the programme of works which shall be presented at the pre contract meeting.

This shall include all wall chases cutting for boxes and making good.

The Contractor shall liaise with the MCC to determine which items of artwork and small artefacts need to be removed in each area.

34. CLEANING REQUIREMENTS UPON COMPLETION OF WORKS

The Contractor shall include to carry out a full and in-depth building sparkle clean to Heaton Hall upon completion of the works (can be carried out in phases if the works are programmed as such)

In summary, a sparkle clean consists of the following activities:

- All dust, debris and building materials are removed.
- Carpets, floors, and all surfaces are deep cleaned.
- Hard floors are polished, and wood floors waxed.
- Detailed window cleaning, including all blinds
- Power washing of the exterior of the building
- Chrome, mirrors, glass, and stainless steel are polished
- Detailed cleaning of skirting boards, paint rails, coves, and door frames
- All sticky label residue and wrappings are removed
- All rubbish is removed from the site

The re-cleaning of any artwork, statues, artefacts, and decorative panels will be carried out by Manchester City Council

The Principal Contractor shall note that he should provide references of three cleaning companies who have carried out such works in a similar timescale for contract administrator approval.

35. REMOVAL OF EXISTING INSTALLATIONS

The Contractor shall include to remove and dispose of the following installations within the building:

(i) Redundant electrical wiring system and associated containment
(ii) Redundant fire alarm wiring systems
(iii) Redundant data and telecoms wiring systems
(iv) Redundant intruder alarm wiring installations.
(v) Redundant electrical equipment such as heaters, fans alarm bell etc.

The Contractor shall note that in many situations wiring systems have not been identified and close investigative work will be required to ascertain the extent of the removal works.

35.1 Band Two Circuits

The Contractor shall note that since the time of construction, whilst adaptations have been undertaken, the existing electrical installation has **not** been removed.

The Contractor shall include to remove and dispose of all existing wiring systems and associated containment where completely new installations are to be installed.

Where existing installations are to be adapted, the Contractor shall include to remove and dispose of all redundant elements of the installation.

In these situations, existing containment can be re-used and adapted to facilitate this new installation.

The Contractor shall include at tender stage to carry out a comprehensive site survey as to the extent of these works. No claim shall be entertained relating to lack of knowledge relating to the scope of these works.

Following partial removal of the electrical installation and prior to the installation of the first fix cabling, the Contractor shall include to contact ECS Consultants in order to carry out an inspection. This inspection is deemed to ascertain all aspects of removal or adjustment/alterations to existing services whether detailed or not. Any claims for want of knowledge will not be considered.

The Contractor shall note that fluorescent lamps are classified as Hazardous Waste.

All existing lamps must be handled, collected, and disposed of in accordance with the requirements of the Environmental Protection Act 1990, Duty of Care Regulations 1991, and Hazardous Waste Regulations 2005.

The fluorescent lamps shall be directed through a tube re-cycling waste route.

The Contractor shall be responsible for the safe handling of the fluorescent lamps; they must have systems in place for dealing with any breakages which occur on site. The Contractor shall be responsible for the clean-up and disposal of resultant spillage.
The Contractor shall make all due allowance within his submission to comply with these requirements.

The Contractor shall note that the existing electrical switchgear contains asbestos gaskets.

Inclusion shall be made to obtain the services of a registered asbestos Sub contractor to advise or assist in the removal of this switchgear.

The Contractor shall include to carry out a comprehensive site survey to ascertain the locations of all redundant switchgear.

35.2 Band One Circuits (Data/Telecoms Circuits)

The Contractor shall note that the existing analogue telecoms system is now redundant but has never been removed.

This system comprises of telecoms grade cable clipped surface to BT approved junction boxes and surface RJ11 outlets.

The Contractor shall include to remove and dispose of this installation where practicable in all areas where refurbishment works are to be undertaken.

The Contractor shall note that this system and redundant data systems have been installed to a poor standard with little containment.

The Contractor shall include at tender stage to carry out a comprehensive site survey as to the extent of these works. No claim shall be entertained relating to lack of knowledge relating to the scope of works.

The Contractor shall include to remove the fire alarm and lighting installations within the undercroft area on the first day of the contract.

36. TEMPORARY SUPPLIES AND LIGHTING

The principal contractor shall include to supply and install temporary electrical supplies to both existing and new distribution boards and general lighting if there is a possibility that the areas would not be ready for the country house and pupils to work in at any time during the normal country house hours. Instruction for the approval to use temporary supplies should be agreed with the contract administrator.

37. PROPOSED PHASING NARRATIVE OF THE WORKS

The contractor shall note that a proposed phasing of the works will be agreed with MCC and detailed within the contract particulars

.

38. SERVICING WORKS DURING DEFECT LIABILITY PERIOD

The Contractor shall include to carry out servicing visits for the following systems during the defects liability period.

38.1 Fire Alarm - Protec

The Contractor shall include to undertake two six monthly service visits in line with BS5839 during the twelve months defects liability period.

Following the completion of the second service visit the Contractor shall conduct a handover meeting with the maintenance Contractor.

38.2 Intruder Alarm – IDS Alarms

The Contractor shall include to undertake two six monthly service visits in line with British Standards during the twelve months defects liability period.

Following the completion of the second service visit the Contractor shall conduct a handover meeting with the maintenance Contractor.

38.3 Emergency Lighting – Electrical Sub Contractor

The Contractor shall include to undertake service visits to service and maintain the emergency lighting systems.

Following the completion of the second service visit the Contractor shall conduct a handover meeting with the maintenance Contractor.

38.4 CCTV Installation – IDS Alarms

The Contractor shall include to undertake two six monthly service visits to service and maintain the CCTV systems.

Following the completion of the second service visit the Contractor shall conduct a handover meeting with the maintenance Contractor.

39. PC SUMS

The Contractor shall note that there is a small number of P.C. Sums included for possible additional works to be funded by the school during the construction phase. The works are as follows:

- Full Risk Assessment, Visual Audit and Testing of Lightning Protection System Including any repairs or new conductors or/and surge protection **- £9,000.00**
- Possible modifications to Electricity North West main incoming supply to the basement electrical layout and removal of redundant transformer **- £10,000.00**
- Supply and install small number of new access control systems inclusive of power supply, magna locks, F.A interfaces, push to open devices etc. - **£1,500.00**
- Supply and install a new video and voice call system located at the main visitor's gate on Laird Road to all reception staff to view visitors before opening the gate **£1,500.00**

The PC sums are included in the priced section of this document.

SCHEDULE OF LUMINAIRES

Refer to Heaton Hall historic Lighting Review
&
Lighting Specialist Quotations

A1	DEXTRA LIGHTING AMENITY PLUS IP65 LED BULKHEAD OPEN WHITE OPAL 1.947m (22.3W) REF: AMEX L30 – OW
A1/E	AS ABOVE C/W 3 HOUR EMERGENCY LIGHTING FACILITY REF: AMEX L30 - OW - LE3
A2	DEXTRA LIGHTING AMENITY EXTERIOR IP65 LED BULKHEAD C/W INTEGRAL PRESENCE SENSOR OPEN WHITE OPAL1.947m REF: AMEX L30 - OW - R25E
A2/E	AS ABOVE C/W 3 HOUR EMERGENCY LIGHTING FACILITY REF: AMEX L30 - OW - R25E - LE3
B1	DEXTRA LIGHTING TYPHON IP65 LINEAR 31.7W LED LUMINAIRE REF: TYP L54 PC55
B1/E	AS ABOVE WITH 3 HOUR EMERGENCY LIGHTING FACILITY REF: TYP L54 PC55 LE3
C1	DEXTRA LIGHTING AMENITY DECORATIVE HALO RANGE 19.7W/119LM/W C/W INTEGRAL PRESENCE DETECTOR. REF: AM/EDH/L30/R25E
C1/E	AS ABOVE WITH 3 HOUR EMERGENCY LIGHTING FACILITY REF: AM/EDH/L30/R25E/LE3
D1	DEXTRA LIGHTING AMENITY PLUS CIRCULAR WHITE OPA L 14W (115LM/W) REF: AMC/L20/WO
D1/E	AS ABOVE WITH 3 HOUR EMERGENCY LIGHTING FACILITY REF: AMC/L20/WO/LE3
X1	CONTRACTOR TO INCLUDE £200 PER LUMINAIRE (SUPPLY ONE). INCLUDE FOR INSTALLATION AND FINAL CONNECTIONS

SCHEDULE OF GENERAL EQUIPMENT

Schedule of Accessories and Equipment

Luminaires	Chelsom Lighting, Brotheridge Lighting Specialist, Dextra Lighting or Similar Equal and Approved
Switches - General Brass/Bronze	MK Logic Plus Grid switch, Metal clad range Click Scolmore, Legrand, Corston or Similar Equal and Approved
Socket Outlets	as above
Spur Units	as above
Switchgear	Schneider as detailed in the Specification or Similar Equal and Approved
BSEN 60309 (formerly BS 4343) Socket Outlets	Martin and Lunel, Mk Electric or similar and approved
Galvanised Steel Cable tray and Cable Basket	RF Cable Trays Swifts Or similar and approved
Galvanised Conduit, PVC Conduit, Trunking Systems and Accessories Systems and Accessories	Walsall Conduits Ltd or similar and approved
Final Circuit LSF include Ref 6491B Stranded 6242 LSZH (Low Smoke Zero Halogen	BICC Group Ltd AEI Cables Ltd or similar and approved
Sub Mains XLPE/SWA/LSF Cables	BICC Group Ltd AEI Cables Ltd or similar and approved
FP200 Cables	Pirelli
Fire Alarm Equipment	Protec Fire Alarm
Intruder Alarm Equipment	IDS Security
CCTV Equipment	IDS Security
Room Thermostats, fans, controllers	Supplied by the mechanical

Pumps and Control Panels	Contractor
Contactor	As main switchgear manufacturer dinn rail mounted within common enclosure.
Plug in Ceiling roses	Mk Electrics Klick Or similar and approved
Internal PIR's	Dextra or Similar Equal and Approved
Absence Detectors	Dextra or Similar Equal and Approved
RCD Units	As per the Switchgear Manufacturer
Plug in Ceiling roses	Mk Electrics Klick Or similar and approved
RCD Units	As per the Switchgear Manufacturer
Hand Dryers	By the Hall
Static Inverters	Kohler Power

PRICED SECTION

	SCHEDULE OF WORKS ELECTRICAL WORKS	Quant	Unit	Rate	£	p
1	General Notes		Item			
2	Contract Administration		Item			
3	Scope of Works		Item			
4	Containment Wiring Supplies and Methods of Installation		Item			
5	Incoming Telecommunications		Item			
6	Incoming Electrical Service		Item			
7	Main Switchgear and Sub-Distribution		Item			
8	Sub-Distribution System		Item			
9	Surge Suppression		Item			
10	ARC Fault Detection Devices (AFDD)		Item			
11	General Lighting Installation and Controls		Item			
12	Emergency Lighting Installation		Item			
13	External Lighting Installation		Item			
14	Small Power Installation		Item			
15	Heating Plant Control Wiring		Item			
16	Wet Area Ventilation Systems		Item			
17	Orangery Block – New Kitchen Supplies		Item			
18	Fire Alarm Installation		Item			
19	Intruder Alarm System		Item			
20	Telecoms and Data		Item			
21	Existing Access Control System		Item			
22	CCTV System		Item			
	- Internal Areas		Item			
	- External Roof Areas Including combined motion detector CCTV camera linked into multi speech control units		Item			
23	Plant Controls		Item			
24	Telephony Installation		Item			

25	Earthing and Bonding		Item			
26	Labels and Circuit Charts		Item			
27	Testing, Commissioning, As Fitted Drawings and Maintenance Manuals		Item			
28	Builders Work		Item			
29	Civil Works		Item			
30	Sealing of Wiring System Penetrations		Item			
31	System Demonstration		Item			
32	Phase Re-balancing		Item			
33	Preparatory Works		Item			
34	Cleaning Requirements Upon Completion of Works		Item			
35	Removal of Existing Installations		Item			
36	Temporary Supplies and Lighting		Item			
37	Proposed Phasing Narrative of the Works		Item			
38	Servicing works During Defect Liability Period		Item			
39	<u>PC Sums</u>					
	Contractor to commission specialist to carry out Lightning Protection Risk Assessment, Visual Audit and Test and Commission, and repair any damaged areas				9,000	00
	Possible modifications to Electricity North West main incoming supply to the basement electrical layout and removal of redundant transformer.				10,000	00
	Supply and install small number of new access control systems inclusive of power supply, magna locks, F.A. interfaces, push to open devices etc.				1,500	00
	Supply and install a new video and voice call system located at the main visitor's gate on Laird Road to all reception staff to view visitors before opening the gate.				1,500	00
	TOTAL					

	ELECTRICAL INSTALLATION	Quant	Unit	Rate	£	p
	PROVISIONAL QUANTITIES **The following Provisional Quantities are rates to be used in the event of variations arising. These rates shall be completed as part of the tender package and summated at the time of tender to the main priced tender to determine the successful tender.**					
	Supply and Installation of FP200 cables drawn through Galvanised basket, trunking, and Conduit					
1	1.5mm^2	10	M			
2	2.5mm^2	10	M			
	Supply and Install 6242 LSZH cables on galvanised steel cable basket					
3	1.5mm^2	10	M			
4	2.5mm^2	10	M			
	Supply and Installation of Luminaires					
		1	each			
6	Type A1 Fitting	1	each			
7	Type A1/E Fitting	1	each			
8	Type A2 Fitting	1	each			
9	Type A2/E Fitting	1	each			
10	Type B1 Fitting	1	each			
11	Type B1/E Fitting	1	each			
12	Type B2 Fitting	1	each			
13	Type B2/E Fitting	1	each			
14	Type C1 Fitting	1	each			
15	Type C1/E Fitting	1	each			
16	Type D1 Fitting	1	each			
17	Type D1/E Fitting	1	each			
18	Type E1 Fitting	1	each			
19	Type E2 Fitting	1	each			
20	Type E3 Fitting	1	each			
21	Type Y1 Floodlight Fitting	1	each			
22	Hi, Track Lighting Spot Light	1	each			
23	Hi Track Emergency Lighting	1	each			
24						
25						
26						

27						
	Hourly Charge out Rate Electrician	10	Hour			
	Approved Electrician	10	Hours			
	Technician	10	Hours			
	CARRIED TO MAIN BILL					

DESIGNER RISK ASSESSMENTS