

ELECTRICAL SERVICES SPECIFICATION

Rushbrook Primary School

Bright Futures

Document No. 23/078/ES/01

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Document Control Sheet

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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 supply, installation, testing and commissioning of the complete new external lighting installation at Rushbrook School Primary.

The works shall comprise of a complete new external lighting installation to be supplied from the Main School Building, new installed cable ducting and cables in a buried trench.

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

The Electrical Contractor is to liaise with the Main Contractor for the excavation of trenches, installation of ducts and erection of columns.

The particular electrical specification shall comprise of the following sections:

1. GENERAL NOTES
2. CONTRACT ADMINISTRATION
3. SCOPE OF WORKS
4. CONTAINMENT WIRING SYSTEMS AND METHODS OF INSTALLATION
5. EQUIPMENT POSITIONS
6. MOUNTING HEIGHTS
7. INCOMING ELECTRICAL SERVICE
8. MAIN SWITCH AND DISTRIBUTION
9. SURGE PROTECTION
10. EXTERNAL LIGHTING INSTALLATION
11. ERECTION OF COLUMNS
12. EXTERNAL LIGHTING CONTROL
13. EARTHING AND BONDING
14. LABELS AND CIRCUIT CHARTS
15. TESTING, COMMISSIONING AS FITTED DRAWINGS AND MAINTENANCE MANUALS
16. SYSTEM DEMONSTRATION
17. BUILDERS WORK
18. CIVIL WORKS
19. SERVICING WORKS DURING DEFECT LIABILITY PERIOD
20. SYSTEM WARRANTY

1. GENERAL NOTES

The complete electrical works, as detailed in this Particular Specification or shown on the associated electrical drawings 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 and 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 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 Electrical Contractor shall include within their tender to obtain all associated Structural tender drawings and Specifications to ascertain the building method, structural elements to ensure the electrical works are carried out in accordance with the relevant British Standards, Codes of Practice, CIBSE Guides and Guidance Notes.

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 Particular 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 and regulations current at the date of tender and in particular with the following:

- i. The Health and Safety at Work Act, 1974.
- ii. The Building Regulations.
- iii. BS7671 18th Edition Regulations for the Requirements for Electrical Installations.
- iv. Electricity at Work Regulations 1989.
- v. The Electricity Safety, Quality and Continuity Regulations 2002.
- vi. Control of Substances Hazardous to Health Regulations 2002.
- vii. CIBSE Guides.
- viii. CDM Regulations 2015.

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 be expended at the discretion of the Contract Administrator.

All drawings issued show the general arrangement of works under the contract and are indicative and are intended as a guide to the Electrical Contractor.

1.1. 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 all difficulties within their offer, as no variation of costs will be considered on the plea of insufficient information during the tender period.

1.2. Site Address

Site visits shall be arranged via Amie McGagh at Black Cat Building Consultancy on 07949 167989. The postal address of the site is:

Rushbrook Primary School
101 Shillingford Road,
Gorton
Manchester
M18 7TN

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 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. 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 representatives.

1.3. The Contractor

The Contractor shall be an Electrical Contractor who must 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 Contractor shall liaise and work with the main Building Contractor who shall undertake all works in relation to the casting of the lamp post concrete bases to the structural engineer's specification, excavating services trenches and installation of cable ducts and associated draw ropes.

2. CONTRACT ADMINISTRATION

The following section shall be read in conjunction with the Employers Requirements document, all other Contract documents and the General Conditions of Contract.

2.1. General

Under the project and contract, the Contractor shall be appointed as a domestic Sub-Contractor to a Main Contractor. The Contractor shall include for all liaisons with the Principal Contractor 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:

23/078/ES/01 Football Pitch Lighting

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.

2.3. Working Drawings

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 containment.

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.

2.4. Coordination Drawings

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.

2.5. Site Meetings

The programming of meetings shall be decided by the Contract Administrator and Principal Contractor to the mutual convenience of all parties. The Contractor shall include for all attendances as required.

2.6. Approval of Materials

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

2.7. 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.

Programme of Works/Access Arrangements

The successful Contractor shall include to liaise with the main Contractor and Contract Administrator, to produce a detailed programme of works, including all traffic management plans and out of hours working as required by the project.

Special Restrictions of Work

General Installation

Generally, works shall be carried out as agreed with the Client / Contract Administrator.

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 Contract Administrator. Any work carried out under the request of an unauthorised source will be at risk.

Key Dates and Contract Conditions

The Contractor shall note that key dates shall be determined by the Main Building Contractor in line with their project programme.

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

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

The Contractor shall include to liaise with the Client/Contract Administrator during the tender period to determine start and completion dates.

Project Management Report

The Contractor shall include to provide a two weekly report to the Main Building Contractor and 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.

Final Positions

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

Prior to setting out the position of any item of electrical and control equipment provided through the electrical and integration contracts, the Electrical Contractor shall obtain confirmation in writing from the Contract Administrator that the details they are working to are correct and current information 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 Electrical 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 Administrator, ECS and Client.

The Electrical 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.

Product Samples

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

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

Quotations

Whilst every endeavour has been made to ensure the accuracy of quotations from suppliers where 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 due allowance within the tender.

Phasing Arrangements and Programming

The Electrical Contractor shall note that the proposed construction of the development is to be carried out in line with the Contract Administrator's programme.

3. SCOPE OF WORKS

3.1. General

The electrical contracts shall be in accordance with the drawings and specifications and shall consist of the supply, installation, connection, testing and commissioning of:

1. Underground cable ducting
2. Band 2 Cabling and Containment
3. Erection and installation of lighting columns

The Contractor shall include to have read at tender stage, all information relating to the architectural and structural 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.

4. CONTAINMENT WIRING SYSTEMS AND METHODS OF INSTALLATION

4.1. General

The following relates to specific methods of installation associated with this project.

Specific clauses dedicated to workmanship are detailed in the General Specification.

4.2. Cables in Trenches

The Contractor shall supply and install 1no. 100mm Ø Band 2 cable duct to facilitate the installation of football pitch lighting.

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.

4.3. Cables

Flexible Cords

The Contractor shall include to supply and install flexible cords from the column cut outs to the luminaires.

Flexible cords shall comply with the requirements of British Safety Standards and shall not be less than 0.75mm² PVC insulated. When the flexible cord supports a luminaire, then the supported weight shall be in accordance with the appropriate table in the IET 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.

4.4. XLPE/SWA/PVC Cables

The Contractor shall include to supply, install, test and commission a complete XLPE/SWA/PVC wiring system from a TP&N Distribution Board within the main school building to the football pitch feeder pillar installation as detailed in the layout drawing.

All cables shall be installed utilising appropriate methods of restraint via manufacturers approved cable cleats or via dedicated containment systems as previously described.

The XLPE/SWA/PVC cables shall be manufactured to the current edition of BS6724.

Cables should be installed and terminated with the appropriate gland termination kits and shroud in accordance with the manufacturers recommendations and the requirements of the latest edition of the BS7671 wiring regulations to suit the environmental conditions served.

The Contractor shall ensure all cables are installed with the appropriate bending radius to suit the cable specification and installation method in accordance with the manufacturers recommendations and the requirements of the current edition of BS7671.

5. EQUIPMENT POSITIONS

The final positions will be determined by inspection by the Client and Contract Administrator as the project proceeds. It is the responsibility of the Contractor to obtain confirmation from the Contract Administrator, Architect and client in writing that the intended location is correct. It is the responsibility of the Contractor to ensure that location confirmation is obtained in good time to eliminate abortive works.

The Contractor shall include to mark out on site using chalk, the locations of all electrical items as shown on his drawings prior to arranging meetings as required to agree on the positions.

In respect of externally mounted components, due allowance shall be made for each item to be relocated both 2 metres vertically and horizontally at the Contractors own expense.

6. 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:

Distribution Boards	1200mm (to bottom of unit)
Lighting Switches	1200mm
Football Pitch Luminaires	11000mm

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 coordinated with mechanical services. Inclusion shall be made to ensure a 150mm gap between the top of radiators and dado trunking systems.

Inclusion shall be made to ensure all accessories, trunking, traywork, basket, dado trunking are co-ordinated with mechanical services.

7. INCOMING ELECTRICAL SERVICE

The Contractor shall note that the existing electrical service comprises of a TP&N service and meter arrangement located in the main school building.

The Contractor shall note that the electricity supply shall be retained.

The Contractor shall include to liaise directly with the Regional Electricity Company to programme in their attendance to safely isolate the TP&N Supply within the school to enable the installation of the new football pitch lighting feeder pillar and control equipment.

8. MAIN SWITCH AND DISTRIBUTION

The Contractor shall include to supply, install, test and commission a complete distribution system to the football pitch lighting installation consisting of a new SP&N 6 way metal clad consumer unit mounted within a locally sited feeder pillar as detailed on the layout drawing.

All distribution equipment shall be manufactured by Schneider Electric or equal and approved.

All MCBs shall be BSEN60898 and rated types B and C to provide positive indication to comply with the requirements of BS7671.

All RCBO's shall be BSEN61009 and rated types B and C to provide positive indication to comply with the requirements of BS7671.

The Contractor shall include for 25% spare capacity both in respect of load capability and spare ways for all distribution equipment.

The new consumer unit spare ways shall be filled using equal numbers of 32A, 20A, 16A, 10A, 6A MCB's and 32A 30mA RCBO's.

The Contractor shall include to label all switchgear. These labels shall be issued in draft format to the contract administrator for comment prior to manufacture.

9. SURGE PROTECTION

The Contractor shall include to supply and install a type 1 and 2 surge protection device (SPD) within the new SP&N consumer unit.

This shall be supplied from a SP&N circuit way closest to the main switch of the consumer unit using 16mm² 6491B LSZH singles cable routed in conduit or trunking from a SP&N 63A protective device.

The Contractor shall supply and install a Schneider ACTi9 surge protection device or equal and approved to the consumer unit.

10. EXTERNAL LIGHTING INSTALLATION

The Electrical Contractor shall include to supply, install, test and commission a complete external lighting system. The lighting shall be designed to reduce light pollution in line with ILE requirements and BS5489 to achieve 10 Lux (average) for the external football pitch area.

The Contractor shall contact:

- | | |
|---|--|
| (1) Abacus Lighting Ltd
Oddicraft Lane
Sutton-in-Ashfield
NG17 5FT | Telephone: 01623 511 111
E-mail: sales@abacuslighting.com |
|---|--|

to supply all external lights and columns or equal and approved.

The external lighting system shall illuminate the football pitch utilising 11m, base hinged lighting column mounted luminaires as detailed on the appropriate drawing.

The Contractor shall include to liaise with the Contract Administrator and Client to confirm finished RAL colours for all external luminaires prior to the placement of any orders.

Control shall be via time switch/photocell arrangement with manual override control within the local feeder pillar. Proposals shall be issued by the Contractor for client approval.

The Contractor shall include to provide a system of external luminaires manufactured as per the luminaire schedule.

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 10m² up to 10m across the full area of the car park and entry roadway.

The Contractor shall include for all out-of-hours working with the commissioning of external lighting systems.

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 previously described.

11. ERECTION OF COLUMNS

The Contractor shall obtain the services of:

- | | |
|---|--|
| (1) Abacus Lighting Ltd
Oddicraft Lane
Sutton-in-Ashfield
NG17 5FT | Telephone: 01623 511 111
E-mail: sales@abacuslighting.com |
|---|--|

or equal and approved to supply 11 metres high (above ground), fixed root mounted steel columns and appropriate mounting arms to the football pitch area as detailed on the relevant ECS layout drawings.

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

Each column shall be complete with a low level terminal cover plate. This shall be lockable and only accessed via a special tool.

All columns and base plates shall be fully galvanised. The structural steelwork shall be manufactured to BSEN 10210-1 and BS7668.

The general steel work shall be to BSEN10255 and BSEN10025.

The galvanising shall be hot dipped to BS EN ISO 1461.

All columns are 5000mm above ground level in all areas.

All columns shall also be complete with single brackets to enable the mounting of external luminaires.

The contractor shall ensure that each column and its particular bracket arrangement is fit for the specific application.

All columns and brackets shall be finished in galvanised steel.

Prior to the installation of any column the Contractor shall submit for approval a sketch detailing the external luminaire and bracket arrangement.

The final location of all columns shall be agreed on site.

The Contractor shall provide for approval, a foundation detail of the columns. The Contractor shall include to obtain the weight of the external luminaires and windage loading and issue these to the Contractor's appointed structural engineer.

12. EXTERNAL LIGHTING CONTROL

The contractor shall include to supply and install a photocell, timeclock, contactor and override switch control system within the local feeder pillar consumer unit.

The supply to the control system shall be via a 6A Type B MCB protective device within the consumer unit. Wired in 1.5mm² 6491B LSZH singles cable terminated into a close coupled metal clad switched fused connection unit fused at 3Amps. This shall supply the photocell, timeclock and override switch.

The override switch shall be metalclad grid switch assembly with the final location to be agreed on site with the client.

13. EARTHING AND BONDING

The Contractor shall include to supply, install, test and commission a complete earthing and bonding installation as required by BS7671.

Main Protective Bonding Conductors

The Contractor shall include to connect equipotential bonding conductors to the MET individually. However, where it is impractical to do so it is permitted to connect them collectively or in groups where the main protective bonding conductor is looped from one extraneous conductive part to another. Where bonding is undertaken in this way, the bonding conductor shall remain unbroken at

intermediate points, thus maintaining continuity to other extraneous conductive parts should one be disconnected.

14. LABELS AND CIRCUIT CHARTS

Labels shall be fitted to all switches and fuseboards and shall be white Dymo self adhesive 6mm black lettering on 12mm white background. 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 consumer units, 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.

The consumer unit 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.

15. TESTING, COMMISSIONING AS FITTED DRAWINGS AND MAINTENANCE MANUALS

Operation and Maintenance Manual

The Electrical Contractor shall include the provision of £1,100.00 to obtain the services of ECS Consultants or a similar specialist to supply three final copy documents (One Paper and Two CD's) upon completion of the project.

The CD's/USB memory sticks shall be in PDF format with Adobe Acrobat Reader.

The CD's/USB memory sticks shall contain the following files:

- (i) PDF word document as described below
- (ii) PDF files of all manufacturers literature
- (iii) Acrobat Reader

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 Contractor for comment four weeks prior to practical completion.

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 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 client's planning supervisor shall include to indicate these in black pen and fax the appropriate sheets to the above specialist.

The electrical Contractor shall to produce As Fitted Drawings using AutoCAD software 2015 or newer.

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.

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. Dismantling and re-assembling of lighting fittings for re-lamping and cleaning
- d. The use criteria and times of items such as timeclocks.

The 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**

Testing

Inspection and testing of the completed system to the requirements of the current Edition of the BS7671 IET Regulations for the Requirements for Electrical Installations. Provision of this documentation is a requirement of Part P of the Building Regulations.

The installation shall be tested in accordance with the relevant section of the current Edition of the BS7671 IET Regulations for the Requirements for Electrical Installations and in accordance with this Specification.

The 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 residents.

An Electrical Installation Completion Certificate accompanied by both a Schedule of Inspections and a Schedule of Test Results, as prescribed in BS7671 IET Regulations for the Requirements for Electrical Installations, 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 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.

16. 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 MCB's
- ii) Operation of RCBO's
- iii) Operation of Lighting Controls System
- iv) 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.

The Contractor shall include to hold various teaching sessions graded for the following personnel:

- (i) Non-Technical Staff
- (ii) Technical Staff
- (iii) FM Contractor

17. BUILDERS WORK

The builders work shall comprise of providing concrete foundations for columns.

Prior to the installation of any columns the contractor shall obtain written approval from the Contract administrator that the foundation detail proposed has been approved by a Structural Engineer.

The Contractor shall include to erect the external luminaire columns complete with structural concrete bases.

The column foundation must be able to withstand windage factors and weight of lights.

18. 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 drawings, 600mm below ground level.

The Principal Contractor shall include for the supply and installation of suitably sized PVC cable duct that will run between lighting columns.

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.

The cable ducts shall be fitted with ropes to allow the SWA cables to be drawn through the ducts after the trenches have been back filled and column foundations have cured. Ropes to be retained in ducts after car park lighting supplies have been fitted, so they can be used for future use if required. The ropes to be nylon and of a minimum cross section of 8 mm².

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.

The flexible duct will provide protection for the SWA cable as it passes through the columns concrete foundation.

The contractor shall include to make good the surface and dispose of any additional earth.

Following completion, the contractor shall include to commission this system.

19. SERVICING WORKS DURING DEFECT LIABILITY PERIOD

The Contractor shall include to carry out servicing visits for the following systems during the defects liability period:

- (i) External Lighting System Checks

20. SYSTEM WARRANTY

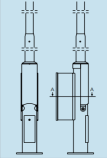
The Contractor shall include to provide a post practical completion two-year manufacturer's parts and labour warranty on:

- (i) Luminaires
- (ii) Distribution Equipment

SCHEDULE OF EQUIPMENT

Doc Title:	Equipment Schedule		
Doc No.:	23/078		
Doc Revision:	A		
Date:	26/05/2021		
Created By:	J.Jackson		
	Manufacturer & Model	Description	Product Image
	Schnieder acti9 range	Consumer Unit	
	Abacus Lighting	Floodlighting and Column	Refer to Luminaire Schedule
	Eland Cables or Equal and Approved	Cable Types: XLP/SWA, T&E, Singles, etc.	
	Ritherdon or Equal and Approved	Feeder Pillar	

SCHEDULE OF LUMINAIRES

	Doc Title:		Luminaire Schedule			
	Doc No.:		23/078			
	Doc Revision:		A			
	Date:		26/05/2021			
	Created By:		J.Jackson			
	ECS Reference	Manufacturer & Model	Description	Wattage & Lamp Type	Dimensions	Luminaire Image
	EXT-01	Abacus Lighting - Challenger 1 1kW wide beam Ref: AL6012	Column Mounted Sports floodlight	1000W LED	L = 819 W = 723 H = 493 KG = 21.4 Ø = 331	
	1	Abacus Lighting - Hinged Base Sports Column Ref: T107RLHE111	Hinged Base Lighting Column	N/A	L = N/A W = N/A H = 11m KG = N/A Ø = N/A	

PRICED SECTION

SCHEDULE OF WORKS
ELECTRICAL WORKS

		Qty	Unit	Rate	£	p
1	General Notes		Item			
2	Contract Administration		Item			
3	Scope of Works		Item			
4	Containment Wiring Systems and Methods of Installation		Item			
5	Equipment Positions		Item			
6	Mounting Heights		Item			
7.	Incoming Electrical Service		Item			
8.	Main Switch and Distribution		Item			
9.	Surge Protection		Item			
10	External Lighting		Item			
11	Erection of Columns		Item			
12	External Lighting Control		Item			
13	Earthing and Bonding		Item			
14	Labels and Circuit Charts		Item			
15	Testing, Commissioning, As Fitted Drawings and Maintenance Manuals		Item			
16	System Demonstration		Item			
17	Builders Work		Item			
18	Civil Works		Item			
19	Servicing Works During Defects Liability Period		Item			
20	System Warranties		Item			
	Total					

	ELECTRICAL REMEDIAL WORKS	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 Luminaires					
1	Type A Luminaire	1	Each			
2	11m Lighting Column	1	Each			
3	XLPE/SWA/PVC 3 core cable	10 m				
4	Hourly Charge out Rate Electrician	10	Hours			
5	Electrician	10	Hours			
6	Approved Electrician	10	Hours			
7	Technician	10	Hours			
	CARRIED TO MAIN BILL					

DESIGNER RISK ASSESSMENTS

ECS Consultants
THE CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS 2015
DESIGNERS RISK ASSESSMENT SHEET

PROJECT:

PROJECT No.:

ENGINEER:

DATE:

ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
<u>1. CONFINED SPACES</u>					
Access to and working in ceiling void.	a) Inadequate lighting or ventilation. b) Injury or damage through falling through ceiling or falling off ladders. c) Working in confined spaces d) Exposure to dust and fibres			✓	i) Temporary lighting. ii) Comply with confined space regulations 1977
<u>2. LIFTING & LOADING</u>					
Moving, unloading and mounting luminaires etc.	a) Injury to operatives	✓			i) Comply with Manual Handling Regulations 1992, (amended 2005). ii) Consider 'Team Handling' for equipment above 20Kg.
<u>3. WORKING FROM HEIGHTS</u>					
Installation of TV equipment. Installation of luminaires	a) Falls from height of persons, materials and tools	✓			i) Comply with Provision and Use of Work Equipment Regulations 1998. ii) Post warning notices and restrict access to the working area where there is a possibility others may be below the work. iii) Extra care when working in areas that could be occupied by pupils.

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DATE:

ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
4. NOISE Work involving use of hammers, percussion drills, core drilling, concrete and brickwork drilling.	a) Noise levels that are in excess of the 'second action level' of 90db(A)		✓		i) Comply with the Noise at Work Regulations 2006 and the Personal Protective Equipment at Work Regulations 1992.
5. FIRE Working in close proximity to trades using torches.	a) Fumes, fire and burns. b) Explosions			✓	i) Consider hot work permit system to ensure that only the proper use of equipment by trained and competent personnel is permitted. ii) Protect combustible materials in the vicinity of the work. iii) Check that nothing is left smouldering at end of work iv) Check cavities, eaves and other voids at the end of work. v) Comply with the Personal Protective Equipment at Work Regulations 1992.
6. ELECTRICITY Working on or near low voltage equipment (up to 415 volts) during the removal of existing supplies and during the installation of new supplies. Portable equipment.	a) Electric shock, fires, burns and physical injury (fall from ladders etc.) b) Electric shock, fires, burns and physical injury. c) Tripping over trailing leads; faulty flexible cables.		✓		i) Comply with the following :- Electricity at Work Regulations 1989 Low Voltage Electrical Equipment (Safety) Regulations 1994. Institution of Engineering & Technology Regulation for Electrical Installations (IET Wiring Regs.) and the related Codes of Practice published by the British Standards Institution. These documents contain the requirements pertaining to safety from electrical shock, fire, burns and physical injury in prescribed circumstances.

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DATE:

ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
Electrical testing and test equipment	d) Electricians need to work on or near live conductors, danger of electrocution, shock and burns, Chemical burns if batteries are used, fall from ladders etc. Caused by reaction to non-lethal electric shocks from voltages including those below 50 volts.		✓		Only NICEIC Electrical Contractors are to be employed. Approved Contractors are required to carry out their work with materials of good quality, installed by competent electricians who are adequately supervised. Partially completed electrical work shall during erection and/or on completion before being put into service, be inspected and tested to verify, so far as is reasonably practical, that the requirements of the Regulations have been met (the Contractor to provide a method statement on how this is to be achieved.)
<u>7. ASBESTOS</u> No asbestos used in construction.	a) Inhalation of the dust can cause respiratory disease and cancer.			✓	i) Identify presence and type of asbestos materials. ii) Removal work to comply with Control of Asbestos at Work Regulations 2006 as amended. iii) Only Licensed Operatives to be employed to comply with the Asbestos (Licensing) Regulations 2006.

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DATE:

ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
<u>8. GAS</u> Working in close proximity to trades installing the new gas installation.	a) Explosion of fire resulting from gas leak.			✓	i) Comply with the Gas Safety (Installation and Use) Regulations 1998. ii) Only operatives who are registered with ACOPS can carry out work on gas installations iii) Contractors to be Gas Safety registered.
<u>9. HAZARDOUS MATERIALS</u> Cutting grease used in the installation of Steel conduit systems.	a) Inhalation or skin contact of cutting grease.		✓		i) Inhibitor chosen must be non-toxic and non-irritant. ii) Care must be taken to keep out of the reach of children. iii) Avoid contact with skin or eyes.
<u>10. DUST AND DIRT</u> Cutting of chases in walls and floors. General building dust caused by other trades.	a) Risk to health of operatives and public.		✓		i) Use of powered cutters and grinders prohibited in tenanted dwellings. ii) Comply with the Control of Substances Hazardous to Health Regulations 2002. iii) Comply with Personal Protective Equipment at Work Regulations 1992.

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DESIGNERS RISK ASSESSMENT SHEET

PROJECT:

PROJECT No.:

ENGINEER:

DATE:

RISK ASSESSMENT TABLE

SEVERITY

H	3	1	1
M	3	2	1
L	3	3	2
	L	M	H

LIKELIHOOD

SEVERITY

H- Fatality, major injury causing long term disability.

M- Injury or illness causing short-term disability

L-Other injury or illness.

LIKELIHOOD

H- Certain or near certain

M- Reasonably likely

L-Very seldom or never.

ACTION

1. High Risk: Action required.

2. Medium Risk: Action required unless good reason.

3. Low Risk: No action required, but review for high severity category.